



AMAL JYOTHI

COLLEGE OF ENGINEERING

KANJIRAPPALLY, KOTTAYAM, INDIA 686 518

AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, KERALA



NAAC
NATIONAL ASSESSMENT AND
ACCREDITATION COUNCIL

| **'A' Grade**

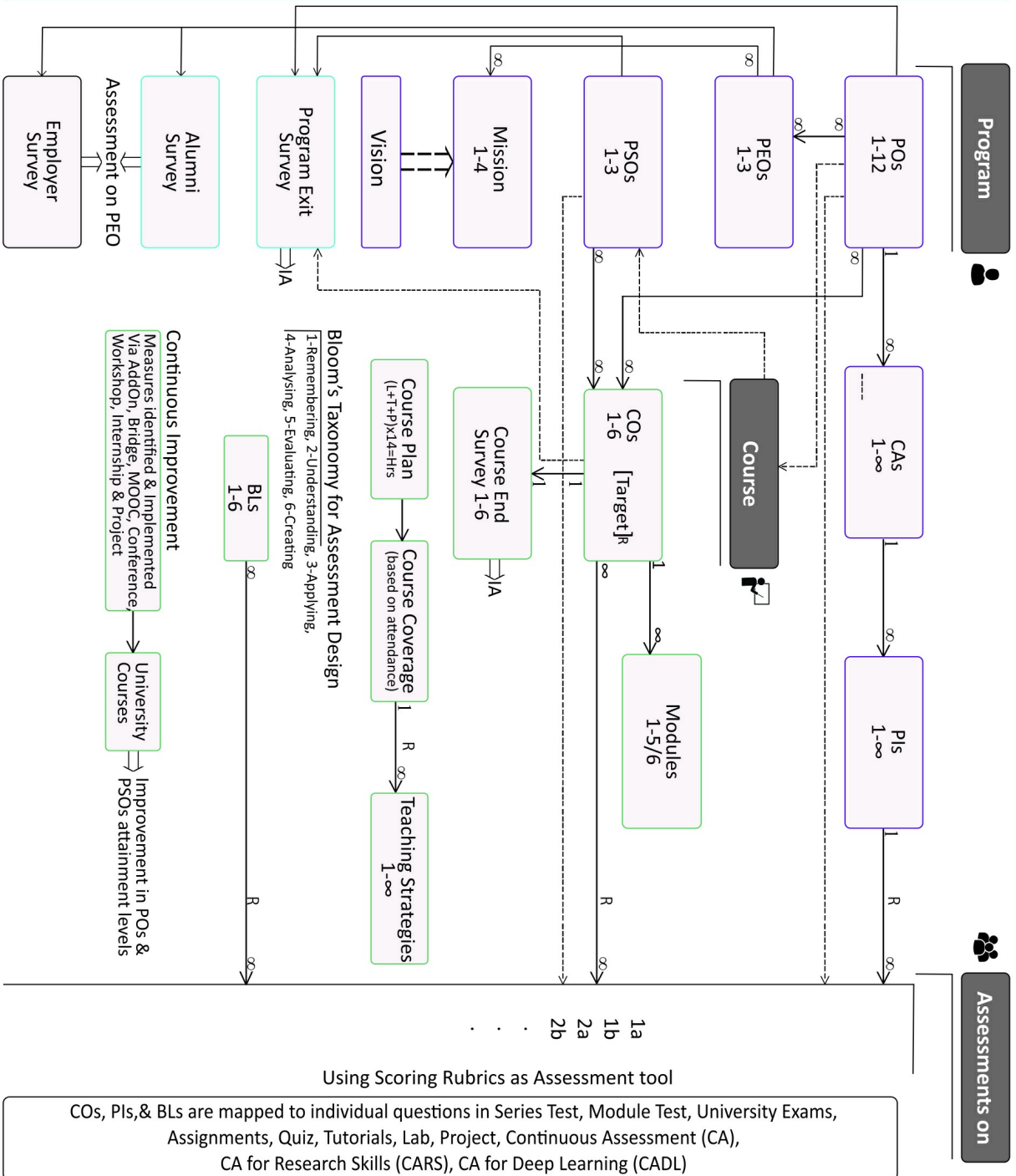
CHEMICAL ENGINEERING

Outcome Based Education Scheme

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OUTCOME BASED EDUCATION FRAMEWORK (OBE) IN ACADEMIC ENTERPRISE SOLUTIONS



Weighted Average (WA)
$(n1 \cdot 1 + n2 \cdot 2 + n3 \cdot 3) / (n1 + n2 + n3)$
n : No of students, multiplied with 3 scale value
Direct Assessment of CO
$(33.33 \cdot \text{Internals WA} + 66.66 \cdot \text{Externals WA}) / 100$
Direct Assessment of PO / PSO
I. Course1.CO1-PO1 PSO1 Score=CO1 Attainment Score * CO1-PO1 PSO1 Mpscore.
II. DA of PO1 PSO1 = [Course1.CO1-01 PSO1 Score + Course1.CO2-PO1 PSO1 Score + ... + nthCourse.nthCO-PO1 PSO1 Score] / [Course1.CO1-PO1 PSO1 Mpscore + Course1.CO2-PO1 PSO1 Mpscore + ... + nthCourse.nthCO-PO1 PSO1 Mpscore]
Indirect Assessment for CO / PO / PSO
Weighted Average on 3-point scale from Course End Survey -> IA for CO
Program Exit Survey -> IA for PO PSO
CO / PO / PSO Attainment
$(80 \cdot \text{DA} + 20 \cdot \text{IA}) / 100$
DA: Direct Assessment, IA: Indirect Assessment
PO Program Outcome
PEO Program Educational Objective
PSO Program Specific Outcome
CAs Competencies to be Attained
PIS Performance Indicators
COs Course Outcomes R Repeated Yearly
BLs Bloom's Taxonomy Levels
Mapping ----> Auto Mapping
Correlation
3-Substantial (High)/2-Moderate(Medium)/1-Slight (Low)

VISION

B.Tech

Accomplish global recognition in the field of Chemical Engineering by generating highly efficient and committed engineers, entrepreneurs and researchers who would excel in conventional as well as emerging areas.

M.Tech

MISSION

B.Tech

- To provide high quality education and training in tune with the developments in Chemical Engineering.
- To develop entrepreneurship skills for transforming knowledge into socially relevant quality products
- To encourage research and development activities and industry-institute interactions for the technical advancements of students.
- To impart awareness of professional ethics, social responsibilities, and sustainable development for serving the society

M.Tech

PROGRAM OUTCOME

B.Tech-Chemical Engineering

Sl.No.	Outcome
PO1	At the end of the Program, a student shall be able to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
PO2	At the end of the Program, a student shall be able to identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	At the end of the Program, a student shall be able to design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
PO4	At the end of the Program, a student shall be able to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	At the end of the Program, a student shall be able to create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	At the end of the Program, a student shall be able to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7	At the end of the Program, a student shall be able to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	At the end of the Program, a student shall be able to apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	At the end of the Program, a student shall be able to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	At the end of the Program, a student shall be able to communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	At the end of the Program, a student shall be able to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	At the end of the Program, a student shall be able to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

M.Tech-Nano Technology

Sl.No.	Outcome
PO1	Apply the knowledge of nanoscience and nanotechnology to solve engineering problems.
PO2	Identify and formulate complex synthesis routes for various nanomaterials.
PO3	Conduct investigations of nanomaterials using various advanced characterization techniques, analyze and interpret data to draw valid conclusions.
PO4	Possess skills in the design of experiments, modeling and simulation related to nanotechnology.
PO5	Carry out laboratory work and multidisciplinary tasks involving nanometrology, material science, nanochemistry and nanobiotechnology.
PO6	Process nanomaterials and develop nanofabrication techniques for NEMS, Nanosensors and related applications.
PO7	Propagate their knowledge and address problems of social relevance such as energy, environment and medicine through their specific electives .
PO8	Analyze the impact of nanomaterials on society including environment, health and ecosystem.

PO9	Execute their own innovative ideas in the form of projects, product design and development.
PO10	Develop confidence for self-education and ability for lifelong learning.
PO11	Commit to professional and ethical responsibilities as an engineer.
PO12	Make use of their expertise in nanoscience and technology principles to manage multidisciplinary projects as an individual or as a member or leader in a team.

M.Tech-Environmental Engineering

Sl.No.	Outcome
PO1	An ability to independently carry out research /investigation and development work to solve practical problems.
PO2	An ability to write and present a substantial technical report/document.
PO3	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program
PO4	Apply the knowledge of environmental sciences to solve engineering problems.
PO5	Possess skills in the design of experiments, modeling and simulation related to environmental engineering.
PO6	Carry out laboratory work and multidisciplinary tasks involving microbiology, analytical techniques, water and wastewater analysis, air and soil testing.
PO7	Update the knowledge on novel environmental remediation methodologies and design suitable retrofits to improve the efficiency of the conventional methods practiced.
PO8	Propagate their knowledge and address problems of social relevance towards environment mitigation strategies.
PO9	Execute their own innovative ideas in the form of projects, product design and development.
PO10	Develop confidence for self-education and ability for lifelong learning.
PO11	Commit to professional and ethical responsibilities as an engineer.
PO12	Make use of their expertise in environmental engineering and technology principles to manage multidisciplinary projects as an individual or as a member or leader in a team.

PhD-PHD CH

PROGRAM EDUCATIONAL OBJECTIVE**B.Tech-Chemical Engineering**

Sl.No.	Objective
PEO1	Our graduates shall excel as engineers or pursue higher studies in Chemical Engineering with a strong fundamental knowledge laid during undergraduate education.
PEO2	Our graduates shall practice as entrepreneurs with ethical attitude and social responsibility.
PEO3	Our graduates shall exhibit an innovative approach for facing the current technical and environmental challenges faced by the society.

M.Tech-Nano Technology**M.Tech-Environmental Engineering**

Sl.No.	Objective
PEO1	To become an effective environmental engineers in the industry, government or any other sector and implement sustainable environmental engineering practices.
PEO2	To provide solutions to environmental problems by applying acquired engineering knowledge.
PEO3	To continue lifelong learning and maintain technical and professional growth.

PhD-PHD CH

PROGRAM SPECIFIC OUTCOME**B.Tech-Chemical Engineering**

Sl.No.	Outcome
PSO1	Graduates of Chemical Engineering Program shall be able to successfully apply the knowledge of principles of science and engineering to identify and solve the real-life problems in Chemical Engineering and allied areas.
PSO2	Graduates of Chemical Engineering Program shall be able to foster research skills to develop sustainable solutions for Chemical Engineering problems.
PSO3	Graduates of Chemical Engineering Program shall be able to acquire essential managerial skills and ethical values to develop oneself as a true leader and a team player.

M.Tech-Nano Technology

Sl.No.	Outcome
PSO1	Successfully apply the knowledge of principles of Nanoscience and technology to identify and solve the real-life problems and develop novel applications in relevant areas.
PSO2	Foster research skills to develop sustainable innovations in interdisciplinary research areas.
PSO3	Acquire essential managerial skills and ethical values to develop oneself as a true leader and a team player.

M.Tech-Environmental Engineering

Sl.No.	Outcome
PSO1	To gain fundamental knowledge in the concepts of environmental pollution control strategies to combat the global issues on public health, safety, energy and environment.
PSO2	To provide solutions by planning, designing, operating and monitoring environmental pollution control systems.
PSO3	To identify research problems and carry out research either independently or in team in multidisciplinary environment.

PhD-PHD CH

COMPETENCIES & PERFORMANCE INDICATORS

B.Tech-Chemical Engineering

1.1 Demonstrate competence in mathematical modelling

1.1.1 Apply mathematical techniques such as calculus, linear algebra. and statistics modelling to solve problems

1.1.2 Apply advanced mathematical techniques to model and solve engineering problems

1.2 Demonstrate competence in basic sciences

1.2.1 Apply laws of natural science to an engineering problem

1.3 Demonstrate competence in engineering fundamentals

1.3.1 Apply fundamental engineering concepts to solve engineering problems

1.4 Demonstrate competence in specialized engineering knowledge to the program

1.4.1 Apply engineering concepts to solve engineering problems

2.1 Demonstrate an ability to identify and formulate complex engineering problem

- 2.1.1 Articulate problem statements and identify objectives
- 2.1.2 Identify engineering systems, variables, and parameters to solve the problems
- 2.1.3 Identify the mathematical, engineering and other relevant knowledge that applies to a given problem

2.2 Demonstrate an ability to formulate a solution plan and methodology for an engineering problem

- 2.2.1 Reframe complex problems into Interconnected sub-problems
- 2.2.2 Identify assemble and evaluate information and resources
- 2.2.3 Identify existing processes/solution methods for solving the problem including forming justified approximations and assumptions
- 2.2.4 Compare and contrast alternative solution processes to select the best process

2.3 Demonstrate an ability to formulate and interpret a model

- 2.3.1 Combine scientific principles and engineering concepts to formulate model's (mathematical or otherwise) al a system or process that is appropriate in terms of applicability and required accuracy
- 2.3.2 Identify assumptions (mathematical and physical) necessary to allow modeling of a system at the level of accuracy required

2.4 Demonstrate an ability to execute a solution process and analyze results

- 2.4.1 Apply engineering mathematics and computations to solve mathematical models
- 2.4.2 Produce and validate results through skillful use of contemporary engineering tools and models
- 2.4.3 Identify sources of error in the solution process, and limitations of the solution
- 2.4.4 Extract desired understanding and conclusions consistent with objectives and limitations of the analysis

3.1 Demonstrate an ability to define a complex open-ended problem in engineering terms

- 3.1.1 Recognize that need analysis is key to good problem definition
- 3.1.2 Elicit and document, engineering requirements from stakeholders
- 3.1.3 Synthesize engineering requirements from a review of the state-of-the-art
- 3.1.4 Extract engineering requirements from relevant engineering Codes and Standards such as ASME, ASTM, BIS, ISO and ASHRAE
- 3.1.5 Explore and synthesize engineering requirements considering health, safety risks. environmental cultural and societal issues
- 3.1.6 Determine design objectives, functional requirements and arrive at specifications

3.2 Demonstrate an ability to generate a diverse set of alternative design solutions

- 3.2.1 Apply formal idea generation tools to develop multiple engineering design solutions
- 3.2.2 Build models/prototypes to develop a diverse set of design solutions
- 3.2.3 Identity suitable criteria for the evaluation of alternative design solutions

3.3 Demonstrate an ability to select an optimal design scheme for further development

- 3.3.1 Apply formal decision-making tools to select optimal engineering design solutions for further development
- 3.3.2 Consult with domain experts and stakeholders to select candidate engineering design solution for further development

3.4 Demonstrate an ability to advance an engineering design to defined end state

- 3.4.1 Refine a conceptual design into a detailed design within the existing constraints of the resources)
- 3.4.2 Generate information through appropriate tests to improve or revise the design

4.1 Demonstrate an ability to conduct investigations of technical issues consistent with their level of knowledge system and understanding

- 4.1.1 Define a problem, its scope and importance for purposes of investigation
- 4.1.2 Examine the relevant methods, tools and techniques of experiment design calibration, data acquisition, analysis and presentation
- 4.1.3 Apply appropriate instrumentation and/or software tools to make measurements of physical quantities
- 4.1.4 Establish a relationship between measured data and underlying physical principles

4.2 Demonstrate an ability to design experiments to solve open-ended problems

- 4.2.1 Design and develop an experimental approach specify appropriate equipment and procedures
- 4.2.2 Understand the importance of the statistical design of experiments and choose an appropriate experimental design plan based on the study objectives

4.3 Demonstrate an ability to analyze data and reach a valid conclusion

- 4.3.1 Use appropriate procedures, tools and techniques to conduct experiments and collect data
- 4.3.2 Analyze data for trends and correlations, stating possible errors and limitations
- 4.3.3 Represent data (in tabular and/or graphical forms) so as to facilitate analysis and explanation of the data, and drawing of conclusions
- 4.3.4 Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions

5.1 Demonstrate an ability to identify/ create modern engineering tools, techniques and resources

5.1.1 Identify modern engineering tools such as computer-aided drafting, modeling and analysis techniques and resources for engineering activities

5.1.2 Create adapt modify/extend tools and techniques to solve engineering problems

5.2 Demonstrate an ability to select and apply discipline-specific tools, techniques and resources

5.2.1 Identify the strengths and limitations of tools for (i) acquiring information (ii) modeling and simulating, (iii) monitoring system performance, and (iv) creating engineering designs.

5.2.2 Demonstrate proficiency in using discipline-specific tools

5.3 Demonstrate an ability to evaluate the suitability and limitations of tools used to solve an engineering problem

5.3.1 Discuss limitations and validate tools, techniques and resources

5.3.2 Verify the credibility of results from tool use with reference to the accuracy and limitations, and the assumptions inherent in their use

6.1 Demonstrate an ability to describe engineering roles in a broader context e.g. pertaining to the environment, safety, health, legal and public welfare

6.1.1 Identify and describe various engineering roles: particularly as pertains to , protection of the public and public interest at the global, regional and local level

6.2 Demonstrate an understanding of professional engineering regulations, legislation and standards

6.2.1 Interpret legislation, regulations, codes, and standards relevant to your discipline and explain its contribution to the protection of the public

7.1 Demonstrate an understanding of the impact of engineering and industrial practices on social, environmental and in economic contexts

7.1.1 Identify risks/impacts in the life-cycle of an engineering product or activity

7.1.2 Understand the relationship between the technical, socio-economic and environmental dimensions of sustainability

7.2 Demonstrate an ability to apply principles of sustainable design and development

7.2.1 Describe management techniques for sustainable development

7.2.2 Apply principles of preventive engineering and sustainable development to an engineering activity or product relevant to the discipline

8.1 Demonstrate an ability to recognize ethical dilemmas

8.1.1 Identify situations of unethical professional conduct and propose ethical alternatives

8.2 Demonstrate an ability to apply the Code of Ethics

- 8.2.1 Identity tenets of the ASME professional code of ethics
- 8.2.2 Examine and apply moral & ethical principles to known case studies

9.1 Demonstrate an ability to form a team and define a role for each member

- 9.1.1 Recognize a variety of working and learning preferences, appreciate the value of diversity on a team
- 9.1.2 Implement the norms of practice (e.g rules, roles, charters, agendas, etc.) of effective team work, to accomplish a goal.

9.2 Demonstrate effective individual and team operations communication, problem-solving, conflict resolution and leadership skills

- 9.2.1 Demonstrate effective communication, problem-solving conflict resolution and leadership skills
- 9.2.2 Treat other team members respectfully
- 9.2.3 Listen to other members
- 9.2.4 Maintain composure in difficult situations

9.3 Demonstrate success in a team-based project

- 9.3.1 Present results as a team with smooth integration of contributions from all Individual efforts

10.1 Demonstrate an ability to comprehend technical literature and document project work

- 10.1.1 Read, understand and interpret technical and non-technical information
- 10.1.2 Produce clear, well-constructed and well-supported written engineering documents
- 10.1.3 Create flow in a document or presentation - a logical progression of ideas so that the main point is clear

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10.3 Demonstrate the ability to integrate different modes of communication

- 10.3.1 Create engineering-standard figures, reports and drawings to complement writing and presentations
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11.1 Demonstrate an ability to evaluate the Economic and financial performance of an engineering activity

- 11.1.1 Describe various economic and financial casts/benefits of an engineering activity
- 11.1.2 Analyze different forms of financial statements to evaluate the financial status of an engineering project

11.2 Demonstrate an ability to compare and contrast the costs/benefits of alternate proposals for an engineering activity

11.2.1 Analyze and select the most appropriate proposal based on economic and financial considerations

11.3 Demonstrate an ability to plan/manage an engineering activity within time and budget constraints

11.3.1 Identify the tasks required to complete an engineering activity and the resources required to complete the tasks

11.3.2 Use project management tools to schedule an engineering project so it is completed on time and on budget

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12.1.1 Describe the rationale for the requirement for continuing professional development

12.1.2 Identify deficiencies or gaps in knowledge and demonstrate an ability to Source information to close this gap

12.2 Demonstrate an ability to identify changing trends in engineering knowledge and practice

12.2.1 Identify historic points of technological advance in engineering that required practitioners to seek education in order to stay current

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12.3 Demonstrate an ability to identify and access sources for new information

12.3.1 Source and comprehend technical literature and other credible sources of information

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- 2.2.1 Reframe complex problems into Interconnected sub-problems
- 2.2.2 Identify assemble and evaluate information and resources
- 2.2.3 Identify existing processes/solution methods for solving the problem including forming justified approximations and assumptions
- 2.2.4 Compare and contrast alternative solution processes to select the best process

2.3 Demonstrate an ability to formulate and interpret a model

- 2.3.1 Combine scientific principles and engineering concepts to formulate model's (mathematical or otherwise) al a system or process that is appropriate in terms of applicability and required accuracy
- 2.3.2 Identity assumptions (mathematical and physical) necessary to allow modeling of a system at the level of accuracy required

2.4 Demonstrate an ability to execute a solution process and analyze results

- 2.4.1 Apply engineering mathematics and computations to solve mathematical models
- 2.4.2 Produce and validate results through skillful use of contemporary engineering tools and models
- 2.4.3 Identify sources of error in the solution process, and limitations of the solution
- 2.4.4 Extract desired understanding and conclusions consistent with objectives and limitations of the analysis

3.1 Demonstrate an ability to define a complex open-ended problem in engineering terms

- 3.1.1 Recognize that need analysis is key to good problem definition
- 3.1.2 Elicit and document, engineering requirements from stakeholders
- 3.1.3 Synthesize engineering requirements from a review of the state-of-the-art
- 3.1.4 Extract engineering requirements from relevant engineering Codes and Standards such as ASME, ASTM, BIS, ISO and ASHRAE
- 3.1.5 Explore and synthesize engineering requirements considering health, safety risks. environmental cultural and societal issues
- 3.1.6 Determine design objectives, functional requirements and arrive at specifications

3.2 Demonstrate an ability to generate a diverse set of alternative design solutions

- 3.2.1 Apply formal idea generation tools to develop multiple engineering design solutions
- 3.2.2 Build models/prototypes to develop a diverse set of design solutions
- 3.2.3 Identity suitable criteria for the evaluation of alternative design solutions

3.3 Demonstrate an ability to select an optimal design scheme for further development

- 3.3.1 Apply formal decision-making tools to select optimal engineering design solutions for further development
- 3.3.2 Consult with domain experts and stakeholders to select candidate engineering design solution for further development

3.4 Demonstrate an ability to advance an engineering design to defined end state

- 3.4.1 Refine a conceptual design into a detailed design within the existing constraints of the resources)
- 3.4.2 Generate information through appropriate tests to improve or revise the design

4.1 Demonstrate an ability to conduct investigations of technical issues consistent with their level of knowledge system and understanding

- 4.1.1 Define a problem, its scope and importance for purposes of investigation
- 4.1.2 Examine the relevant methods, tools and techniques of experiment design calibration, data acquisition, analysis and presentation
- 4.1.3 Apply appropriate instrumentation and/or software tools to make measurements of physical quantities
- 4.1.4 Establish a relationship between measured data and underlying physical principles

4.2 Demonstrate an ability to design experiments to solve open-ended problems

- 4.2.1 Design and develop an experimental approach specify appropriate equipment and procedures
- 4.2.2 Understand the importance of the statistical design of experiments and choose an appropriate experimental design plan based on the study objectives

4.3 Demonstrate an ability to analyze data and reach a valid conclusion

- 4.3.1 Use appropriate procedures, tools and techniques to conduct experiments and collect data
- 4.3.2 Analyze data for trends and correlations, stating possible errors and limitations
- 4.3.3 Represent data (in tabular and/or graphical forms) so as to facilitate analysis and explanation of the data, and drawing of conclusions
- 4.3.4 Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions

5.1 Demonstrate an ability to identify/ create modern engineering tools, techniques and resources

- 5.1.1 Identify modern engineering tools such as computer-aided drafting, modeling and analysis techniques and resources for engineering activities
- 5.1.2 Create adapt modify/extend tools and techniques to solve engineering problems

5.2 Demonstrate an ability to select and apply discipline-specific tools, techniques and resources

- 5.2.1 Identify the strengths and limitations of tools for (i) acquiring information (ii) modeling and simulating, (iii) monitoring system performance, and (iv) creating engineering designs.
- 5.2.2 Demonstrate proficiency in using discipline-specific tools

5.3 Demonstrate an ability to evaluate the suitability and limitations of tools used to solve an engineering problem

- 5.3.1 Discuss limitations and validate tools, techniques and resources
- 5.3.2 Verify the credibility of results from tool use with reference to the accuracy and limitations, and the assumptions inherent in their use PO6

6.1 Demonstrate an ability to describe engineering roles in a broader context e.g. pertaining to the environment, safety, health, legal and public welfare

- 6.1.1 Identify and describe various engineering roles: particularly as pertains to , protection of the public and public interest at the global, regional and local level

6.2 Demonstrate an understanding of professional engineering regulations, legislation and standards

- 6.2.1 Interpret legislation, regulations, codes, and standards relevant to your discipline and explain its contribution to the protection of the public

7.1 Demonstrate an understanding of the impact of engineering and industrial practices on social, environmental and in economic contexts

- 7.1.1 Identity risks/impacts in the life-cycle of an engineering product or activity
- 7.1.2 Understand the relationship between the technical, socio-economic and environmental dimensions of sustainability

7.2 Demonstrate an ability to apply principles of sustainable design and development

- 7.2.1 Describe management techniques tor sustainable development
- 7.2.2 Apply principles of preventive engineering and sustainable development to an engineering activity or product relevant to the discipline PO8

8.1 Demonstrate an ability to recognize ethical dilemmas

- 8.1.1 Identity situations of unethical professional conduct and propose ethical alternatives

8.2 Demonstrate an ability to apply the Code of Ethics

- 8.2.1 Identity tenets of the ASME professional code of ethics
- 8.2.2 Examine and apply moral & ethical principles to known case studies

9.1 Demonstrate an ability to form a team and define a role for each member

- 9.1.1 Recognize a variety of working and learning preferences, appreciate the value of diversity on a team
- 9.1.2 Implement the norms of practice (e.g rules, roles, charters, agendas, etc.) of effective team work, to accomplish a goal.

9.2 Demonstrate effective individual and team operations communication, problem-solving, conflict resolution and leadership skills

- 9.2.1 Demonstrate effective communication, problem-solving conflict resolution and leadership skills
- 9.2.2 Treat other team members respectfully
- 9.2.3 Listen to other members
- 9.2.4 Maintain composure in difficult situations

9.3 Demonstrate success in a team-based project

9.3.1 Present results as a team with smooth integration of contributions from all Individual efforts

10.1 Demonstrate an ability to comprehend technical literature and document project work

10.1.1 Read, understand and interpret technical and non-technical information

10.1.2 Produce clear, well-constructed and well-supported written engineering documents

10.1.3 Create flow in a document or presentation - a logical progression of ideas so that the main point is clear

10.2 Demonstrate competence in listening, speaking, and presentation

10.2.1 Listen to and comprehend information Instructions and viewpoints of others

10.2.2 Deliver effective oral presentations to technical and non-technical audiences

10.3 Demonstrate the ability to integrate different modes of communication

10.3.1 Create engineering-standard figures, reports and drawings to complement writing and presentations

10.3.2 Use a variety of media effectively to convey a message in a document or a presentation

11.1 Demonstrate an ability to evaluate the Economic and financial performance of an engineering activity

11.1.1 Describe various economic and financial casts/benefits of an engineering activity

11.1.2 Analyze different forms of financial statements to evaluate the financial status of an engineering project

11.2 Demonstrate an ability to compare and contrast the costs/benefits of alternate proposals for an engineering activity

11.2.1 Analyze and select the most appropriate proposal based on economic and financial considerations

11.3 Demonstrate an ability to plan/manage an engineering activity within time and budget constraints

11.3.1 Identify the tasks required to complete an engineering activity and the resources required to complete the tasks

11.3.2 Use project management tools to schedule an engineering project so it is completed on time and on budget

12.1 Demonstrate an ability to identify gaps in knowledge and a strategy to close these gaps

12.1.1 Describe the rationale for the requirement for continuing professional development

12.1.2 Describe the rationale for the requirement for continuing professional development

12.2 Demonstrate an ability to identify changing trends in engineering knowledge and practice

- 12.2.1 Identify historic points of technological advance in engineering that required practitioners to seek education in order to stay current
- 12.2.2 Recognize the need and be able to clearly explain why it is vitally important to keep current regarding new developments in your field

12.3 Demonstrate an ability to identify and access sources for new information

- 12.3.1 Source and comprehend technical literature and other credible sources of information
- 12.3.2 Analyze sourced technical and popular information for feasibility, viability, sustainability, etc. Nano Technology

PhD-PHD CH

BLOOM'S TAXONOMY FOR ASSESSMENT DESIGN

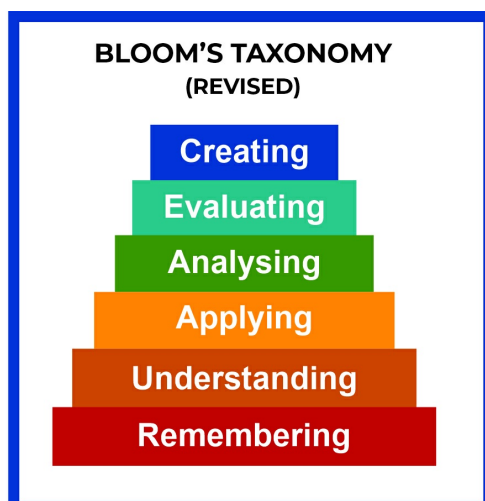


Fig. : Revised Bloom's Taxonomy

Level	Descriptor	Level of attainment
1	Remembering	Recalling from the memory of the previously learned material
2	Understanding	Explaining ideas or concepts
3	Applying	Using the information in another familiar situation
4	Analysing	Breaking information into the part to explore understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of viewing things

Level	Skill Demonstrated	Question cues / Verbs for tests
1. Remember	<ul style="list-style-type: none"> Ability to recall of information like facts, conventions, definitions, jargon, technical terms, classifications, categories, and criteria ability to recall methodology and procedures, abstractions, principles, and theories in the field knowledge of dates, events, places mastery of subject matter 	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where
2. Understand	<ul style="list-style-type: none"> understanding information grasp meaning translate knowledge into new context interpret facts, compare, contrast order, group, infer causes predict consequences 	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
3. Apply	<ul style="list-style-type: none"> use information use methods, concepts, laws, theories in new situations solve problems using required skills or knowledge Demonstrating correct usage of a method or procedure 	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
4. Analyse	<ul style="list-style-type: none"> break down a complex problem into parts Identify the relationships and interaction between the different parts of a complex problem identify the missing information, sometimes the redundant information and the contradictory information, if any 	classify, outline, break down, categorize, analyze, diagram, illustrate, infer, select
5. Evaluate	<ul style="list-style-type: none"> compare and discriminate between ideas assess value of theories, presentations make choices based on reasoned argument verify value of evidence recognize subjectivity use of definite criteria for judgments 	assess, decide, choose, rank, grade, test, measure, defend, recommend, convince, select, judge, support, conclude, argue, justify, compare, summarize, evaluate
6. Create	<ul style="list-style-type: none"> use old ideas to create new ones Combine parts to make (new) whole, generalize from given facts relate knowledge from several areas predict, draw conclusions 	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

TEACHING - LEARNING STRATEGIES

1. BLENDED LEARNING
2. BRAINSTORMING
3. CASE STUDY
4. COMPUTER AIDED PRESENTATION
5. COMPUTER LABS/LAPTOP INSTRUCTION
6. DEMONSTRATION
7. DIRECT INSTRUCTION
8. DISCOVERY LEARNING
9. DISCUSSION
10. DRILL AND PRACTICE
11. EXAMINATION
12. FLIPPED CLASS
13. FULLY ONLINE INSTRUCTION
14. GROUP ACTIVITIES
15. INQUIRY
16. LECTURE
17. MENTAL MODELING
18. MOOC ONLINE
19. PROJECT DEVELOPMENT
20. PROJECT PRESENTATION
21. QUESTION AND ANSWER
22. ROLE PLAY
23. SELF-LEARNING
24. SEMINAR
25. TUTORIAL
26. WEB-ENHANCED LEARNING

PO-CA-PI MAPPING SUMMARY

B.Tech-Chemical Engineering

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
No CAs	4	4	4	3	3	2	2	2	3	3	3	3
No PIs	5	13	13	10	6	2	4	3	7	7	5	6

M.Tech-Nano Technology

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
No CAs	4	4	4	3	3	2	2	2	3	3	3	3
No PIs	5	13	13	10	6	2	4	3	7	7	5	6

M.Tech-Environmental Engineering

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
No CAs	4	4	4	3	3	2	2	2	3	3	3	3
No PIs	5	13	13	10	6	2	4	3	7	7	5	6

PhD-PHD CH

PEO-PO MAPPING

Correlation Levels: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), empty – no correlation

B.Tech-Chemical Engineering

PEO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	3	3	3	3	3			2	2	3	3	3
PEO2			3			2	3	3	3	3		3
PEO3	3		3	3			3	2	3	3	3	

M.Tech-Nano Technology

PEO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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M.Tech-Environmental Engineering

PEO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1												
PEO2												

PEO3												
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PhD-PHD CH

PEO-MISSION MAPPING**B.Tech-Chemical Engineering**

PEO/MISSION	MS1	MS2	MS3	MS4
PEO1	3		2	
PEO2	2	3	1	3
PEO3	2	2	3	2

M.Tech-Nano Technology**M.Tech-Environmental Engineering**

PhD-PHD CH

PROGRAM EXIT SURVEY**B.Tech-Chemical Engineering**

Sl.No.	The extent to which engineering education has enhanced your ability to:
1	Apply the knowledge of mathematics, physics, chemistry and basic engineering to solve Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
2	Identify, formulate and analyze complex Engineering problems and derive meaningful conclusions using principles of mathematics, science and engineering
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
3	Design efficient processes and develop high quality products giving due consideration to safety, environmental issues and economic aspects
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
4	Conduct investigation of complex Engineering problems using research based methods, analyze and interpret data to draw valid conclusions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>

5	Acquire skills to select and use modern engineering tools and software for modeling, simulation and solution of complex Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
6	Apply contextual knowledge to assess societal, health, safety, legal and cultural issues in professional practice to become a responsible engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
7	Understand the societal and environmental impacts of applying Engineering to solve real life problems and practice sustainable development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
8	Work with full commitment to professional and ethical responsibilities as an engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
9	Work individually in a team or as a leader in any demanding or challenging environment
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
10	Communicate effectively with engineering community or the society at large through appropriate reports, designs, presentations and instructions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
11	Engage in life-long learning in the broadest context of developments in technology for continuous professional development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
12	Understand engineering and management principles and apply these to manage multidisciplinary projects and finance as an individual or as a member or leader of a team
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
13	How frequently are you able to solve real life Chemical Engineering problems
	<i>Very frequently, Frequently, Rarely, Very rarely, Never</i>
14	Do you agree that you have attained adequate skills to carry out research leading to sustainable solutions for Chemical Engineering problems

	<i>Strongly agree, Agree, Neutral, Disagree, Strongly disagree</i>
15	Were the skills and ethical values acquired through this program helpful for your development as a team leader.
	<i>Extremely helpful, Moderately helpful, Helpful, A little helpful, Not at all helpful</i>

M.Tech-Nano Technology

Sl.No.	The extent to which engineering education has enhanced your ability to:
1	Apply the knowledge of mathematics, physics, chemistry and basic engineering to solve Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
2	Identify, formulate and analyze complex Engineering problems and derive meaningful conclusions using principles of mathematics, science and engineering
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
3	Design efficient processes and develop high quality products giving due consideration to safety, environmental issues and economic aspects
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
4	Conduct investigation of complex Engineering problems using research based methods, analyze and interpret data to draw valid conclusions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
5	Acquire skills to select and use modern engineering tools and software for modeling, simulation and solution of complex Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
6	Apply contextual knowledge to assess societal, health, safety, legal and cultural issues in professional practice to become a responsible engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
7	Understand the societal and environmental impacts of applying Engineering to solve real life problems and practice sustainable development

	<i>Very Strong, Strong, Average, weak , Very Weak</i>
8	Work with full commitment to professional and ethical responsibilities as an engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
9	Work individually in a team or as a leader in any demanding or challenging environment
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
10	Communicate effectively with engineering community or the society at large through appropriate reports, designs, presentations and instructions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
11	Engage in life-long learning in the broadest context of developments in technology for continuous professional development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
12	Understand engineering and management principles and apply these to manage multidisciplinary projects and finance as an individual or as a member or leader of a team
	<i>Very Strong, Strong, Average, weak , Very Weak</i>

M.Tech-Environmental Engineering

Sl.No.	The extent to which engineering education has enhanced your ability to:
1	Apply the knowledge of mathematics, physics, chemistry and basic engineering to solve Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
2	Identify, formulate and analyze complex Engineering problems and derive meaningful conclusions using principles of mathematics, science and engineering
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
3	Design efficient processes and develop high quality products giving due consideration to safety, environmental issues and economic aspects
	<i>Very Strong, Strong, Average, weak , Very Weak</i>

4	Conduct investigation of complex Engineering problems using research based methods, analyze and interpret data to draw valid conclusions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
5	Acquire skills to select and use modern engineering tools and software for modeling, simulation and solution of complex Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
6	Apply contextual knowledge to assess societal, health, safety, legal and cultural issues in professional practice to become a responsible engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
7	Understand the societal and environmental impacts of applying Engineering to solve real life problems and practice sustainable development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
8	Work with full commitment to professional and ethical responsibilities as an engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
9	Work individually in a team or as a leader in any demanding or challenging environment
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
10	Communicate effectively with engineering community or the society at large through appropriate reports, designs, presentations and instructions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
11	Engage in life-long learning in the broadest context of developments in technology for continuous professional development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
12	Understand engineering and management principles and apply these to manage multidisciplinary projects and finance as an individual or as a member or leader of a team
	<i>Very Strong, Strong, Average, weak , Very Weak</i>

Sl.No.	The extent to which engineering education has enhanced your ability to:
1	Apply the knowledge of mathematics, physics, chemistry and basic engineering to solve Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
2	Identify, formulate and analyze complex Engineering problems and derive meaningful conclusions using principles of mathematics, science and engineering
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
3	Design efficient processes and develop high quality products giving due consideration to safety, environmental issues and economic aspects
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
4	Conduct investigation of complex Engineering problems using research based methods, analyze and interpret data to draw valid conclusions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
5	Acquire skills to select and use modern engineering tools and software for modeling, simulation and solution of complex Engineering problems
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
6	Apply contextual knowledge to assess societal, health, safety, legal and cultural issues in professional practice to become a responsible engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
7	Understand the societal and environmental impacts of applying Engineering to solve real life problems and practice sustainable development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
8	Work with full commitment to professional and ethical responsibilities as an engineer
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
9	Work individually in a team or as a leader in any demanding or challenging environment
	<i>Very Strong, Strong, Average, weak , Very Weak</i>

10	Communicate effectively with engineering community or the society at large through appropriate reports, designs, presentations and instructions
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
11	Engage in life-long learning in the broadest context of developments in technology for continuous professional development
	<i>Very Strong, Strong, Average, weak , Very Weak</i>
12	Understand engineering and management principles and apply these to manage multidisciplinary projects and finance as an individual or as a member or leader of a team
	<i>Very Strong, Strong, Average, weak , Very Weak</i>

ALUMNI SURVEY

Objective: Collect alumni views to help us improve our programs and assess the effectiveness of Outcome based education framework adopted here.

Sl.No.	Question
1	Name
2	Organization
3	Qualification secured from Amal Jyothi College of Engineering (AJCE)
4	Year of Graduation from AJCE
5	E-mail ID
6	Mobile No
7	Present Status
	<i>[Employed/ Entrepreneur/ Pursuing higher studies/ Working at home/ Other]</i>
8	Present Employment level
	<i>[High managerial/ Middle Managerial /Low Managerial/ Non-managerial/Other]</i>
9	Number of Years of experience at the present level
	<i>[above 10/ between 5 and 10/ between 2 and 5/ between 1 and 2/ less than 1]</i>

10	Is your present job in the core area of Engineering you have studied?
	<i>[very much/ strongly related / weakly related/ not at all related/ no relation to engineering at all]</i>
11	How well have you been able to apply your knowledge of Mathematics, Science and Engineering fundamentals for the solution of engineering problems in your work?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
12	How well have you been able to identify, formulate and analyze complex Engineering problems and derive meaningful conclusions using principles of mathematics, science and engineering in your work?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
13	How well have you been able to design efficient processes and develop high quality products giving due consideration to safety, environmental issues and economic aspects?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
14	How well have you been able to conduct investigation of complex Engineering problems using research based methods, analyze and interpret data to draw valid conclusions?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
15	How well have you been able to select and use modern engineering tools and software for modeling, simulation and solution of complex Engineering problems?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
16	How well have you been able to apply contextual knowledge to assess societal, health, safety, legal and cultural issues in your professional practice as a responsible engineer?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
17	How well have you been able to understand the societal and environmental impacts of applying Engineering to solve real life problems and practice sustainable development?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
18	How well have you been able to work with full commitment to your professional and ethical responsibilities as an engineer?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
19	How well have you been able to work successfully as an individual, in a team or as a team leader in any demanding or challenging environment?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>

20	How well have you been able to communicate effectively through written and oral modes to all levels of stakeholders in society?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
21	How well have you been engaging yourself in life-long learning in the broadest context of developments in technology for continuous professional development?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
22	How well have you been able to apply engineering and management principles to manage multidisciplinary projects as an individual or as a team member or team leader?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
23	To what extent do you think you are able to apply your technical knowledge and take on higher responsibilities in industry, academics and diverse fields of your engineering specialization?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
24	How far you are in a position to pursue continual path of professional development, interspersed with advanced education and continuing enhancement programs, relevant to your specific career goals?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
25	How far you are able to channelize your knowledge base, business links and social contacts into socially beneficial activities?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
26	How far you able to provide effective and efficient real time solutions to Engineering problems in your area, based on acquired knowledge so as to empower industry and society?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
27	How far you are able to enhance research skills to develop sustainable solutions to Complex Engineering problems in your area of work?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
28	How far you have acquired managerial skills and ethical values to develop yourself as a true leader and team player?
	<i>[very well/ somewhat well / rarely well/ not at all/ not applicable]</i>
29	Other suggestions, if any:

EMPLOYER SURVEY

Objective: Collect the views of Employers of our Graduates to help us improve our programs and assess the effectiveness of Outcome based education framework practiced here.

Sl.No.	Question
1	Name of the Company/Organization
2	Name of the person responding to this Survey
3	Address
4	E-mail ID
5	Mobile No
6	Present Status (Title/Designation)
7	No. of years of Experience in the Company/Organization
8	Please, indicate the Professional Background of the person responding to this survey
9	Please indicate the number of Alumni employed by your Company/ Organization, who have graduated from Amal Jyothi College of Engineering (AJCE), who are considered for this Survey
10	How do you rate the level of engineering knowledge of our Graduate(s)?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
11	How do you evaluate the technical competence/skills of our Graduate (s)?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
12	How do you feel the Graduate(s) of AJCE were trained properly for carrying out the work in your company/ organization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
13	How effectively can he/she use modern engineering tools to solve problems connected with his/her assigned work?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
14	Can the Graduate(s) work effectively as an individual or in a team to accomplish a common goal for the company/organization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>

15	How far the Graduate(s) is/are able to lead a team of technical personnel to accomplish a given task for the company/organization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
16	How well the Graduate(s) can work in a collaborative multidisciplinary professional work group in your organization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
17	How active is/are the Graduate(s) as a member(s) of any professional society or organization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
18	How far the Graduate is interested to enhance his/her professional skills by attending short courses/ workshops, training programs or conferences/ meetings?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
19	How far the Graduate is interested in enhancing his qualifications by enrolling for higher Degrees, like M Tech., MBA, Ph D etc.?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
20	How satisfied are you with the communication skills of our Graduate(s)?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
21	How far our Graduate(s) have the technical skills to design, develop, implement and modify integrated projects in the field of his/her engineering specialization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
22	How do you rate the level of his/her integrity/adherence to ethical principles in his work?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
23	How do you rate his/her efficiency to manage finance related matters in your company/organization?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
24	How do you rate his/her concerns and awareness for environmental issues and sustainable development?
	<i>[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]</i>
	Overall, how well satisfied are you with the performance of the AJCE Graduate(s)?

25	[Excellent/ Good / Fair/ Needs improvement/ Not up to the mark]
25	Suggestions, if any, for molding our Graduates as still better engineers

COURSE OUTCOMES

B.Tech-Chemical Engineering

SEMESTER-1

MA101

Course Code	Course Name	L-T-P:C	Year of Introduction
MA101	CALCULUS	3-1-0:4	2016

No.	Course Outcome - MA101 - CALCULUS	Target
CO1	Apply the concept of convergence of infinite series to solve Engineering problems	60%
CO2	Apply the concept of maxima and minima of functions of two variables to solve Engineering problems	60%
CO3	Apply calculus of vector-valued functions to dynamical quantities like velocity and acceleration	60%
CO4	Identify and use Multiple Integrals to evaluate surface area and volume	60%
CO5	Apply the concepts of Divergence and Curl to solve Engineering problems	60%
CO6	Demonstrate the application of vector calculus theorems to evaluate different integrals	60%

COURSE END SURVEY - MA101 - CALCULUS

Sl.No	Questions & Options
CO1	To what extent you are able to apply the concept of convergence of infinite series to solve Engineering problems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to apply the concept of maxima and minima of functions of two variables to solve Engineering problems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to apply calculus of vector-valued functions to dynamical quantities like velocity and acceleration
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to identify and use Multiple Integrals to evaluate surface area and volume
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to extent apply the concepts of Divergence and Curl to solve Engineering problems

	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to demonstrate the application of vector calculus theorems to evaluate different integrals
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - MA101 - CALCULUS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3						2	2	2
CO2	3	3	3	3						2	2	2
CO3	3	3	3	3						2	2	2
CO4	3	3	3	3						2	2	2
CO5	3	3	3	3						2	2	2
CO6	3	3	3	3						2	2	2

CO->PSO MAPPING - MA101 - CALCULUS

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
CO6	3	2	

COURSE->PO MAPPING - MA101 - CALCULUS

MA101/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3						2	2	2

COURSE->PSO MAPPING - MA101 - CALCULUS

MA101/PSO	PSO1	PSO2	PSO3
	3	2	

PH100

Course Code	Course Name	L-T-P:C	Year of Introduction
PH100	Engineering Physics	3-1-0:4	2016

No.	Course Outcome - PH100 - Engineering Physics	Target
CO1	Analyse different phenomena associated with the generation and propagation of oscillations and waves	65%
CO2	Demonstrate wave-like phenomena associated with light and use them to measure its properties	60%
CO3	Illustrate the phenomenon of superconductivity and evaluate the properties of the superconducting state	65%
CO4	Identify the features of quantum and statistical phenomena and demonstrate the dynamics of microscopic entities.	65%
CO5	Describe the production and properties of acoustic and ultrasonic waves and demonstrate their applications.	65%
CO6	Outline the construction and properties of different lasers and optoelectronic devices, and identify their applications	65%

COURSE END SURVEY - PH100 - Engineering Physics

Sl.No	Questions & Options
CO1	To what extent you are able to Analyse different phenomena associated with the generation and propagation of oscillations and waves?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to Demonstrate wave-like phenomena associated with light and use them to measure its properties
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to Illustrate the phenomenon of superconductivity and evaluate the properties of the superconducting state
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to Identify the features of quantum and statistical phenomena and demonstrate the dynamics of microscopic entities.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to Describe the production and properties of acoustic and ultrasonic waves and
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to Outline the construction and properties of different lasers and optoelectronic devices, and identify their applications
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - PH100 - Engineering Physics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2									2
CO2	3	2	2									

CO3	3	2	2									
CO4	3	2	2									
CO5	3	2	2									
CO6	3	2	1		1							

CO->PSO MAPPING - PH100 - Engineering Physics

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	
CO6	3	1	

COURSE->PO MAPPING - PH100 - Engineering Physics

PH100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2		1							2

COURSE->PSO MAPPING - PH100 - Engineering Physics

PH100/PSO	PSO1	PSO2	PSO3
	3	1	

BE100

Course Code	Course Name	L-T-P:C	Year of Introduction
BE100	Engineering Mechanics	3-1-0:4	2016

No.	Course Outcome - BE100 - Engineering Mechanics	Target
CO1	Analyse reactions of various supports under equilibrium	55%
CO2	Determine the forces in planar and spatial systems	55%
CO3	Comprehend the properties of planes and solids	55%
CO4	Determine friction under static conditions	55%
CO5	Identify basic concepts of dynamic problems	55%

COURSE END SURVEY - BE100 - Engineering Mechanics

Sl.No	Questions & Options
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CO1	To what extent you are able to analyse reactions of various supports under equilibrium?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extent you are able to determine the forces in planar and spatial systems?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extent you are able to comprehend the properties of planes and solids?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extent you are able to determine friction under static conditions?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	To what extent you are able to identify basic concepts of dynamic problems?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - BE100 - Engineering Mechanics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2							
CO2	3	3	3	3								
CO3	3	3	2	2	2							
CO4	3	3	3	3	2							
CO5	3	3	2	2	2							

CO->PSO MAPPING - BE100 - Engineering Mechanics

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	1	

COURSE->PO MAPPING - BE100 - Engineering Mechanics

BE100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2							

COURSE->PSO MAPPING - BE100 - Engineering Mechanics

BE100/PSO	PSO1	PSO2	PSO3
	3	2	

BE103

Course Code	Course Name	L-T-P:C	Year of Introduction
BE103	Introduction to Sustainable Engineering	2-0-1:3	2016

No.	Course Outcome - BE103 - Introduction to Sustainable Engineering	Target
CO1	Explain the role of engineering in sustainable development and environmental protection	60%
CO2	Describe global environmental issues and the consequent threats to sustainable development	61%
CO3	Apply simple, efficient and indigenous solutions to assess and overcome threats to sustainability	60%
CO4	Identify and apply engineering methods and eco-friendly solutions to maintain a green environment	60%
CO5	Demonstrate the relevance of non-conventional energy sources for sustainable development of the society	61%
CO6	Recognize the role of technology in the sustainable development of society and industry	61%

COURSE END SURVEY - BE103 - Introduction to Sustainable Engineering

Sl.No	Questions & Options
CO1	To what extent are you able to explain the role of engineering in sustainable development and environmental protection
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to describe global environmental issues and the consequent threats to sustainable development
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to apply simple, efficient and indigenous solutions to assess and overcome threats to sustainability
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to Identify and apply engineering methods and eco-friendly solutions to maintain a green environment
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to demonstrate the relevance of non-conventional energy sources for sustainable development of the society
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent are you able to recognize the role of technology in the sustainable development of society and industry
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - BE103 - Introduction to Sustainable Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	2					3	3	3		2		2
CO2		3	3			3	3	3	2	2		3
CO3	3	3	3	3	2	3	3	2				2
CO4	3	3	3		2	3	3	3	2		3	2
CO5	2				3	3	3					
CO6	3				2	3	3	3				

CO->PSO MAPPING - BE103 - Introduction to Sustainable Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1		2	1
CO2		2	1
CO3	2	2	1
CO4	3	2	1
CO5	2	1	
CO6	2	2	1

COURSE->PO MAPPING - BE103 - Introduction to Sustainable Engineering

BE103/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	3	3	3	2	2	3	3

COURSE->PSO MAPPING - BE103 - Introduction to Sustainable Engineering

BE103/PSO	PSO1	PSO2	PSO3
	3	2	1

PH110

Course Code	Course Name	L-T-P:C	Year of Introduction
PH110	Engineering Physics Lab	0-0-2:1	2016

No.	Course Outcome - PH110 - Engineering Physics Lab	Target
CO1	Measure basic physical quantities, such as voltage, frequency, temperature etc and evaluate measurement accuracy.	70%
CO2	Measure and analyse the properties of electrical and acoustic waves and oscillations, and demonstrate resonance.	70%
CO3	Demonstrate wave-like properties of light and measure the wavelength of monochromatic light sources	70%

CO4	Illustrate the propagation of light through an optical fibre and measure its numerical aperture	70%
CO5	Demonstrate the working of devices such as solar cells and photoelectric cells	70%
CO6	Organize an experimental set up and measure fundamental constants such as the Planck's constant.	70%

COURSE END SURVEY - PH110 - Engineering Physics Lab

Sl.No	Questions & Options
CO1	To what extent you are able to Measure basic physical quantities, such as voltage, frequency, temperature etc and evaluate measurement accuracy.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to Measure and analyse the properties of electrical and acoustic waves and oscillations, and demonstrate resonance.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to Demonstrate wave-like properties of light and measure the wavelength of monochromatic light sources
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to Illustrate the propagation of light through an optical fibre and measure its numerical aperture
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to Demonstrate the working of devices such as solar cells and photoelectric cells
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to Organize an experimental set up and measure fundamental constants such as the Planck's constant.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - PH110 - Engineering Physics Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		2	2				2	2		
CO2	3	3		2	2				2	2		
CO3	3	3		2	2				2	2		
CO4	3	3		2	2				2	2		
CO5	3	2		2	2				2	2		
CO6	2	3		2	3				2	2		

CO->PSO MAPPING - PH110 - Engineering Physics Lab

CO/PSO	PSO1	PSO2	PSO3
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CO1	3		2
CO2	3		2
CO3	3		2
CO4	3		2
CO5	3		2
CO6	2		2

COURSE->PO MAPPING - PH110 - Engineering Physics Lab

PH110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3		2	3				2	2		

COURSE->PSO MAPPING - PH110 - Engineering Physics Lab

PH110/PSO	PSO1	PSO2	PSO3
	3		2

CY100

Course Code	Course Name	L-T-P:C	Year of Introduction
CY100	Engineering Chemistry	3-1-0:4	2016

No.	Course Outcome - CY100 - Engineering Chemistry	Target
CO1	Demonstrate the principles of spectroscopy and apply them to explain chemical phenomena	0%
CO2	Illustrate principles and applications of various electrochemical techniques and cells.	60%
CO3	Discuss instrumental methods like chromatography, conductivity and thermal analysis for chemical analysis.	60%
CO4	Recognize the properties and applications of engineering materials, such as polymers and nanomaterials	60%
CO5	Evaluate the properties of complex chemicals such as fuels and lubricants.	60%
CO6	Describe the properties of water and identify methods for water purification	60%

COURSE END SURVEY - CY100 - Engineering Chemistry

Sl.No	Questions & Options
CO1	To what extent you are able to demonstrate the principles of spectroscopy and apply them to explain chemical phenomena Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to Illustrate principles and applications of various electrochemical techniques and cells.

	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to discuss instrumental methods like chromatography, conductivity and thermal analysis for chemical analysis.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to recognize the properties and applications of engineering materials, such as polymers and nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to evaluate the properties of complex chemicals such as fuels and lubricants.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to describe the properties of water and identify methods for water purification
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CY100 - Engineering Chemistry

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	3	3	3					3
CO2	3	3	2		3							
CO3	3	3	2		3			2				
CO4	3	2	2	2	3							
CO5	3		2		3	3	3	3				
CO6	3		2			3	2					2

CO->PSO MAPPING - CY100 - Engineering Chemistry

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
CO6	3	2	

COURSE->PO MAPPING - CY100 - Engineering Chemistry

CY100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	3	3	3	3				3

COURSE->PSO MAPPING - CY100 - Engineering Chemistry

CY100/PSO	PSO1	PSO2	PSO3
	3	2	

CH110

Course Code	Course Name	L-T-P:C	Year of Introduction
CH110	Chemical Engineering Workshops	0-0-2:1	2016

No.	Course Outcome - CH110 - Chemical Engineering Workshops	Target
CO1	Prepare commercial products like soaps, pigments and biodiesel	65%
CO2	Measure the specific gravity of solutions and flash and fire points of fuels	70%
CO3	Demonstrate the use of mass transfer equipment like distillation column and absorption column	70%
CO4	Illustrate the use of heat transfer equipment like heat exchanger	70%
CO5	Demonstrate the operation of size reduction equipment	70%

COURSE END SURVEY - CH110 - Chemical Engineering Workshops

Sl.No	Questions & Options
CO1	How far can you prepare products like soaps, pigments and biodiesel?
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO2	How far can you measure specific gravity of solutions and flash and fire points of fuels?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO3	To what extent you can demonstrate the working of mass transfer equipment?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How far can you illustrate the working of heat transfer equipment?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent can you operate size reduction equipment?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - CH110 - Chemical Engineering Workshops

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		3		2	1	1	1	3	3		1
CO2	3		1		2				2	2		
CO3	3			3	2				2	2		

CO4	3			3	2				2	2		
CO5	3			3	2				2	2		

CO->PSO MAPPING - CH110 - Chemical Engineering Workshops

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	2
CO2	2	1	
CO3	3	1	1
CO4	3	1	1
CO5	3	1	1

COURSE->PO MAPPING - CH110 - Chemical Engineering Workshops

CH110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3		3	3	2	1	1	1	3	3		1

COURSE->PSO MAPPING - CH110 - Chemical Engineering Workshops

CH110/PSO	PSO1	PSO2	PSO3
	3	1	2

BE10106

Course Code	Course Name	L-T-P:C	Year of Introduction
BE10106	Introduction to Chemical Engineering	2-1-0:3	2016

No.	Course Outcome - BE10106 - Introduction to Chemical Engineering	Target
CO1	Demonstrate the relevance of Chemical Engineering and its relation to other disciplines.	65%
CO2	Identify the concept of concentration of solutions and unit conversions.	65%
CO3	Identify and enlist chemical processes, operations and the corresponding equipment.	65%
CO4	Demonstrate the basics of heat transfer and reaction engineering.	65%
CO5	Evaluate instrumentation requirements and control strategies related to chemical engineering.	65%
CO6	Evaluate and assess the environmental aspects of Chemical Engineering.	65%

COURSE END SURVEY - BE10106 - Introduction to Chemical Engineering

Sl.No	Questions & Options
CO1	To what extent you are able to demonstrate the relevance of Chemical Engineering and its relation to other disciplines.

	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How far you are able to use your knowledge on concentration of solutions and unit conversions.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to list chemical processes, operations and the corresponding equipment.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to demonstrate the basics of heat transfer and reaction engineering
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to evaluate instrumentation requirements and control strategies.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to evaluate and assess environmental aspects of Chemical Engineering
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - BE10106 - Introduction to Chemical Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3		1	2	2	1	2	2	1	2	2
CO2	3	2	1	2	1	2			2	1	2	2
CO3	2	2	1	1	1	1		1	2	3	2	3
CO4	2	2	1	2	1	1	1		3	2	3	3
CO5	3	2	1	2		1	1	1	2	2	1	1
CO6	2	2	1	2	2	1	2	2	1	1	1	2

CO->PSO MAPPING - BE10106 - Introduction to Chemical Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	3		
CO3	2	1	
CO4	2	3	
CO5	1	2	
CO6	2	1	1

COURSE->PO MAPPING - BE10106 - Introduction to Chemical Engineering

BE10106/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	1	2	2	2	2	2	3	3	3	3

COURSE->PSO MAPPING - BE10106 - Introduction to Chemical Engineering

BE10106/PSO	PSO1	PSO2	PSO3
	3	3	1

CY110

Course Code	Course Name	L-T-P:C	Year of Introduction
CY110	Engineering Chemistry Lab	0-0-2:1	2016

No.	Course Outcome - CY110 - Engineering Chemistry Lab	Target
CO1	Analyse and measure the quality of water and environmental pollution.	65%
CO2	Analyse and identify unknown compounds from spectral measurements.	65%
CO3	Prepare different polymers for industrial applications.	65%
CO4	Find the strength and pH of unknown solutions using different instrumental methods.	65%
CO5	Measure the percentage of metal present in metal ore.	65%
CO6	Apply and demonstrate theoretical concepts of Engineering Chemistry.	65%

COURSE END SURVEY - CY110 - Engineering Chemistry Lab

Sl.No	Questions & Options
CO1	To what extent you are able to do analyse and measure the quality of water and environmental pollution.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to do analyse and identify unknown compounds from spectral measurements.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to prepare different polymers for industrial applications.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to find the strength and pH of unknown solutions using different instrumental methods.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to measure the percentage of metal present in metal ore.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to apply and demonstrate theoretical concepts of Engineering Chemistry.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CY110 - Engineering Chemistry Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	3	2	2	1	3	3	3	2	3		2	2
CO2	3	2	2	1	3		3	2	3		2	
CO3	3	2	2	1	2	2	3	2	3	2	2	3
CO4	3	2	3	1	3	3	3		3		2	
CO5	3	2	3	1	3	3	3		3		2	
CO6	3	2	2	1	3	3	3	2	3	2	2	2

CO->PSO MAPPING - CY110 - Engineering Chemistry Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	2	1
CO5	3	2	1
CO6	3	2	1

COURSE->PO MAPPING - CY110 - Engineering Chemistry Lab

CY110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	1	3	3	3	2	3	2	2	3

COURSE->PSO MAPPING - CY110 - Engineering Chemistry Lab

CY110/PSO	PSO1	PSO2	PSO3
	3	2	1

EE110

Course Code	Course Name	L-T-P:C	Year of Introduction
EE110	Electrical Engineering Workshop	0-0-2:1	2016

No.	Course Outcome - EE110 - Electrical Engineering Workshop	Target
CO1	Explain electrical power supplies and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and the importance of protective measures in wiring systems.	65%
CO2	Demonstrate different configurations of wires, cables and other accessories used in wiring circuits	65%
CO3	Demonstrate different lighting circuits for domestic and commercial buildings	65%

CO4	Wire different lighting circuits for domestic and commercial buildings	65%
CO5	Distinguish between light and power circuits to control and measure circuit parameters such as current, voltage and power	65%

COURSE END SURVEY - EE110 - Electrical Engineering Workshop

Sl.No	Questions & Options
CO1	to what extend you are familiar with Electrical power supply and their limitations, knowledge of standard voltages and their tolerances, safety aspects of electrical systems and the importance of protective measures in wiring systems Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	whether you gain the working knowledge of different configurations of wires, cables and other accessories used in wiring circuits Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	Are you able to do different lighting circuits for domestic and commercial buildings Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO4	Are you able to wire up different lighting circuits for domestic and commercial buildings Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	Are you able to distinguish between light and power circuits to control and measure circuit parameters such as current, voltage and power Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - EE110 - Electrical Engineering Workshop

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2				3	2	2	2	2		3
CO2	3				2				2	2		2
CO3	3								2	2		3
CO4	3	2	2		2			2	2	2		3
CO5	3								2	2		2

CO->PSO MAPPING - EE110 - Electrical Engineering Workshop

CO/PSO	PSO1	PSO2	PSO3
CO1	2		1
CO2	2		1
CO3	2		1
CO4	2		1
CO5	2		1

COURSE->PO MAPPING - EE110 - Electrical Engineering Workshop

EE110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2		2	3	2	2	2	2		3

COURSE->PSO MAPPING - EE110 - Electrical Engineering Workshop

EE110/PSO	PSO1	PSO2	PSO3
	2		1

EE100

Course Code	Course Name	L-T-P:C	Year of Introduction
EE100	Basics of Electrical Engineering	2-1-0:3	2016

No.	Course Outcome - EE100 - Basics of Electrical Engineering	Target
CO1	Summarize the basics of electrical engineering applied to various engineering problems	60%
CO2	Perform mathematical analysis of electric circuits and its power measurement	60%
CO3	Illustrate the basics of magnetism and apply it to electric machines	60%
CO4	Assess the basic structure of machines and power systems	60%
CO5	Evaluate the basic circuits and machines used in real world	60%

COURSE END SURVEY - EE100 - Basics of Electrical Engineering

Sl.No	Questions & Options
CO1	Are you able to solve basics electrical engineering problems
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	To what extent you are able to perform mathematical analysis of electric circuits and its power measurement
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent can you solve basic magnetic circuit problems?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extent you are able to assess the basic structure of machines and power systems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	Are you able to evaluate the basic circuits and machines used in real world
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - EE100 - Basics of Electrical Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					2						3
CO2	3	3	3	2								2
CO3	3	2	2									
CO4	3			2	2							
CO5	3	3				2						3

CO->PSO MAPPING - EE100 - Basics of Electrical Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	3		
CO2	3		
CO3	3		
CO4	3		
CO5	3		

COURSE->PO MAPPING - EE100 - Basics of Electrical Engineering

EE100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	2	2						3

COURSE->PSO MAPPING - EE100 - Basics of Electrical Engineering

EE100/PSO	PSO1	PSO2	PSO3
	3		

MAT101

Course Code	Course Name	L-T-P:C	Year of Introduction
MAT101	LINEAR ALGEBRA AND CALCULUS	3-1-0:4	2019

No.	Course Outcome - MAT101 - LINEAR ALGEBRA AND CALCULUS	Target
CO1	Solve systems of linear equations, diagonalize matrices and characterize quadratic forms	60%
CO2	Compute the partial and total derivatives and maxima and minima of multivariable functions	60%
CO3	Compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and center of gravity of plane laminas	55%
CO4	Perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent	60%
CO5	Determine the Taylor and Fourier series expansion of functions and learn their applications	60%

COURSE END SURVEY - MAT101 - LINEAR ALGEBRA AND CALCULUS

Sl.No	Questions & Options
CO1	To what extent are you able to solve systems of linear equations, diagonalize matrices and characterise quadratic forms ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you are able to compute the partial and total derivatives and maxima and minima of multivariable functions ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you are able to compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminae ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you are able to perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to determine the Taylor and Fourier series expansion of functions and learn their applications ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - MAT101 - LINEAR ALGEBRA AND CALCULUS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	1							1
CO2	3	3	3	3	1							1
CO3	3	3	3	3	2							1
CO4	3	2	3	2	2							1
CO5	3	3	3	3	2							1

CO->PSO MAPPING - MAT101 - LINEAR ALGEBRA AND CALCULUS

CO/PSO	PSO1	PSO2	PSO3
CO1	3		1
CO2	3		1
CO3	3		1
CO4	3		1
CO5	3		1

COURSE->PO MAPPING - MAT101 - LINEAR ALGEBRA AND CALCULUS

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

MAT101/PO	3	3	3	3	2							1
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COURSE->PSO MAPPING - MAT101 - LINEAR ALGEBRA AND CALCULUS

MAT101/PSO	PSO1	PSO2	PSO3
	3		1

PHT110

Course Code	Course Name	L-T-P:C	Year of Introduction
PHT110	ENGINEERING PHYSICS B	3-1-0:4	2019

No.	Course Outcome - PHT110 - ENGINEERING PHYSICS B	Target
CO1	Compute the quantitative aspects of waves and oscillations in engineering systems.	60%
CO2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.	60%
CO3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.	60%
CO4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment	60%
CO5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications	60%

COURSE END SURVEY - PHT110 - ENGINEERING PHYSICS B

Sl.No	Questions & Options
CO1	To what extent you are able to compute the quantitative aspects of waves and oscillations in engineering systems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to apply interference and diffraction in different natural optical processes and optical instruments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to analyze the behavior of matter in the atomic and subatomic level through the principles of quantum mechanics ?. How can it be used to perceive the microscopic processes in electronic devices ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to apply the knowledge of ultrasonics in non-destructive testing ?. How the principles of acoustics can be used to improve acoustic design and to provide a safe and healthy environment.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO5	To what extent you are able to apply laser and fibre optic communication systems in various engineering applications
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - PHT110 - ENGINEERING PHYSICS B

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2							2	
CO2	3	2	2		2							
CO3	3	2	2	2								
CO4	3			2	2						3	
CO5	3		2	2	2						3	

CO->PSO MAPPING - PHT110 - ENGINEERING PHYSICS B

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	
CO2	3	1	
CO3	3	3	
CO4	3	2	
CO5	3	2	

COURSE->PO MAPPING - PHT110 - ENGINEERING PHYSICS B

PHT110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	2	2						3	

COURSE->PSO MAPPING - PHT110 - ENGINEERING PHYSICS B

PHT110/PSO	PSO1	PSO2	PSO3
	3	3	

EC100

Course Code	Course Name	L-T-P:C	Year of Introduction
EC100	Basics of Electronics Engineering	2-1-0:3	2016

No.	Course Outcome - EC100 - Basics of Electronics Engineering	Target
CO1	Identify and select necessary components used in various electronic circuits.	60%
CO2	Design and organize simple circuits using different types of diodes and transistors	60%

CO3	Demonstrate the working of analog circuits such as rectifiers, amplifiers and oscillators	60%
CO4	Illustrate the working of basic building blocks of analog and digital systems such as Operational amplifiers and Logic gates.	60%
CO5	Demonstrate the use of basic measuring instruments used in electronics work.	70%
CO6	Compare and contrast various modulation techniques, communication systems and TV signal transmission techniques	70%

COURSE END SURVEY - EC100 - Basics of Electronics Engineering

Sl.No	Questions & Options
CO1	To what extent you are able to Identify and select necessary components used in various electronic circuits?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to Design and organize simple circuits using different types of diodes and transistors
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to Demonstrate the working of analog circuits such as rectifiers, amplifiers and oscillators ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to Illustrate the working of basic building blocks of analog and digital systems such as Operational amplifiers and Logic gates?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to Demonstrate the use of basic measuring instruments used in electronics work?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to Compare and contrast various modulation techniques, communication systems and TV signal transmission techniques ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - EC100 - Basics of Electronics Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		1	2						
CO2	3	2	2		1	2						
CO3	3	2	2		1	2						
CO4	3	2	2		1	2						
CO5	3	2	2		1	2						
CO6	3	2	2		1	2						

CO->PSO MAPPING - EC100 - Basics of Electronics Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	3		
CO2	3		
CO3	3		
CO4	3		
CO5	3		
CO6	3		

COURSE->PO MAPPING - EC100 - Basics of Electronics Engineering

EC100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2		1	2						

COURSE->PSO MAPPING - EC100 - Basics of Electronics Engineering

EC100/PSO	PSO1	PSO2	PSO3
	3		

EST100

Course Code	Course Name	L-T-P:C	Year of Introduction
EST100	ENGINEERING MECHANICS	2-1-0:3	2019

No.	Course Outcome - EST100 - ENGINEERING MECHANICS	Target
CO1	Revise the basic principles of statics and evaluate reactions under equilibrium	55%
CO2	Analyze planar and spatial force systems	55%
CO3	Determine friction under static conditions	55%
CO4	Comprehend the properties of planes and solids	55%
CO5	Identify basic concepts of kinetics and kinematics	55%
CO6	Assess the concept of vibrations	55%

COURSE END SURVEY - EST100 - ENGINEERING MECHANICS

Sl.No	Questions & Options
CO1	To what extent are you able to revise the basic principles of statics and evaluate reactions under equilibrium ?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	To what extent are you able to analyze planar and spatial force systems ?

	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extent are you able to determine friction under static conditions ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to comprehend the properties of planes and solids ?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	To what extent are you able to identify basic concepts of kinetics and kinematics ?
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO6	To what extent are you able to assess the concept of vibrations ?
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>

CO->PO MAPPING - EST100 - ENGINEERING MECHANICS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2						2		
CO2	3	3	2	2						2		
CO3	3	3	2	2						2		
CO4	3	3	2	2						2		
CO5	3	3	2	2						2		
CO6	3	3	2	2						2		

CO->PSO MAPPING - EST100 - ENGINEERING MECHANICS

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	1	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	
CO6	2	1	

COURSE->PO MAPPING - EST100 - ENGINEERING MECHANICS

EST100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2						2		

COURSE->PSO MAPPING - EST100 - ENGINEERING MECHANICS

	PSO1	PSO2	PSO3

EST100/PSO	2	1	
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est130

Course Code	Course Name	L-T-P:C	Year of Introduction
est130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0:4	2019

No.	Course Outcome - est130 - BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	Target
CO1	Apply fundamental concepts and circuit laws to solve simple DC electric and magnetic circuits	60%
CO2	Develop and solve models of magnetic circuits	60%
CO3	Apply the fundamental laws of electrical engineering to solve simple ac circuits on steady state	60%
CO4	Identify and select necessary components used in various electronic circuits.	60%
CO5	Describe and outline the working principle of a voltage amplifier and electronic instrumentation system	60%
CO6	Explain the principle of radio and cellular communication	60%

COURSE END SURVEY - est130 - BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

Sl.No	Questions & Options
CO1	To what extent you are able to apply fundamental concepts and circuit laws to solve simple DC electric and magnetic circuits
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extent you are able to develop and solve models of magnetic circuits
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent you are able to apply the fundamental laws of electrical engineering to solve simple ac circuits on steady state
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extent you are able to identify and select necessary components used in various electronic circuits.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent you are able to describe and outline the working principle of a voltage amplifier and electronic instrumentation system
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	To what extent you are able to explain the principle of radio and cellular communication
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - est130 - BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		1	3						2	
CO2	2	2									2	
CO3	2	2										
CO4	2	2										
CO5	2	2			2							
CO6	2	2			3						2	

CO->PSO MAPPING - est130 - BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - est130 - BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

est130/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2		1	3						2	

COURSE->PSO MAPPING - est130 - BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

est130/PSO	PSO1	PSO2	PSO3

HUN101

Course Code	Course Name	L-T-P:C	Year of Introduction
HUN101	LIFE SKILLS	2-0-2:0	2019

No.	Course Outcome - HUN101 - LIFE SKILLS	Target
CO1	Define and identify different life skills required in personal and professional life (Remembering-1).	60%
CO2	Develop self- awareness and apply well-defined techniques to cope with emotions, and stress (Creating-6).	60%
CO3	Examine the basic mechanics of effective communication and demonstrate through presentations (Applying-3).	60%

CO4	Judge a case or a situation by taking part in group discussions (Evaluating-5).	60%
CO5	Analyse and solve new problems using creative and critical thinking (Analysing-4).	60%
CO6	Discuss the basics of teamwork and leadership (Understanding-2).	60%

COURSE END SURVEY - HUN101 - LIFE SKILLS

Sl.No	Questions & Options
CO1	I am able to define and identify different life skills required in personal and professional life.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	I am able to develop self- awareness and apply well-defined techniques to cope with emotions, and stress.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	I am able to examine the basic mechanics of effective communication and demonstrate through presentations.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	I am able to Judge a case or a situation by taking part in group discussions
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	I am able to analyse and solve new problems using creative and critical thinking
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO6	I am capable of form team and take leadership
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - HUN101 - LIFE SKILLS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1	1	3	1	2	3	2	3	2
CO2	1		1			3	1	3	3	3	3	2
CO3	1	1	1		1	2	1	3	3	3	3	3
CO4	1		2		2	2	1	3	3	2	3	3
CO5	1	3	3	3	2	1	2	3	3	3	2	2
CO6	1		1			2	1	3	3	3	3	2

CO->PSO MAPPING - HUN101 - LIFE SKILLS

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			

CO4			
CO5			
CO6			

COURSE->PO MAPPING - HUN101 - LIFE SKILLS

HUN101/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	3	3	3	2	3	2	3	3	3	3	3

COURSE->PSO MAPPING - HUN101 - LIFE SKILLS

HUN101/PSO	PSO1	PSO2	PSO3

PHL120

Course Code	Course Name	L-T-P:C	Year of Introduction
PHL120	ENGINEERING PHYSICS LAB	0-0-2:1	2019

No.	Course Outcome - PHL120 - ENGINEERING PHYSICS LAB	Target
CO1	Apply modern instruments like CRO, strain gauge to measure the basic physical quantities viz. frequency and amplitude of a wave pattern, strain etc. Carryout measurement of wave pattern in a stretched string and the corresponding frequency values using a Melde's string apparatus.	60%
CO2	Determine the wavelength of monochromatic beam of light and thickness of micro-thin object etc. by forming Newton's rings pattern and an air wedge fringe pattern. Carryout the measurement of wavelength by diffraction of plane transmission grating and the spectra formed by a monochromatic beam of light and a laser.	60%
CO3	Carryout the measurement of wavelength of a semiconductor diode Laser by grating.	60%
CO4	Evaluate the properties of a solar cell and LED through its I-V characteristics.	60%
CO5	Measurement of numerical aperture of an optic fibre	60%

COURSE END SURVEY - PHL120 - ENGINEERING PHYSICS LAB

Sl.No	Questions & Options
CO1	1. To what extent you are able to apply modern instruments like CRO, strain gauge to measure the basic physical quantities viz. frequency and amplitude of a wave pattern, strain etc. (b) Carryout measurement of wave pattern in a stretched string and the corresponding frequency values using a Melde's string apparatus.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	2. To what extent you are able to determine the wavelength of monochromatic beam of light and thickness of micro-thin object etc. by forming Newton's rings pattern and an air wedge fringe pattern.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	3. To what extent you are able to Carryout the measurement of wavelength of a semiconductor diode Laser by grating.

	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	4. To what extent you are able to evaluate the properties of a solar cell and LED through its characteristics.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	5. To what extent you are able to determine the losses and measure numerical aperture of an optic fibre
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - PHL120 - ENGINEERING PHYSICS LAB

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2						2			2
CO2	3	2	2						2			2
CO3	3	2	2						2			2
CO4	3	2	2						2			2
CO5	3	2	2						2			2

CO->PSO MAPPING - PHL120 - ENGINEERING PHYSICS LAB

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	

COURSE->PO MAPPING - PHL120 - ENGINEERING PHYSICS LAB

PHL120/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2						2			2

COURSE->PSO MAPPING - PHL120 - ENGINEERING PHYSICS LAB

PHL120/PSO	PSO1	PSO2	PSO3
	2	1	

ESL130

Course Code	Course Name	L-T-P:C	Year of Introduction
ESL130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2:1	2019

No.	Course Outcome - ESL130 - ELECTRICAL & ELECTRONICS WORKSHOP	Target
CO1	Demonstrate safety measures against electric shocks	56%
CO2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols	56%
CO3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings	56%
CO4	Identify and test various electronic components and equipments	56%
CO5	Draw circuit schematics with EDA tools	56%
CO6	Assemble and test electronic circuits on boards	56%

COURSE END SURVEY - ESL130 - ELECTRICAL & ELECTRONICS WORKSHOP

Sl.No	Questions & Options
CO1	To what extent you are able to demonstrate safety measures against electric shocks
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO2	To what extent you are able to identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO3	To what extent you are able to develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO4	To what extent you are able to identify and test various electronic components and equipments
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO5	To what extent you are able to draw circuit schematics with EDA tools
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO6	To what extent you are able to assemble and test electronic circuits on boards
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>

CO->PO MAPPING - ESL130 - ELECTRICAL & ELECTRONICS WORKSHOP

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						1		2	2			
CO2	1		2		3						1	
CO3	2	1			3							
CO4	1								2			
CO5					2				2			

CO6									2			
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CO->PSO MAPPING - ESL130 - ELECTRICAL & ELECTRONICS WORKSHOP

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - ESL130 - ELECTRICAL & ELECTRONICS WORKSHOP

ESL130/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	1	2		3	1		2	2		1	

COURSE->PSO MAPPING - ESL130 - ELECTRICAL & ELECTRONICS WORKSHOP

ESL130/PSO	PSO1	PSO2	PSO3

PHT100

Course Code	Course Name	L-T-P:C	Year of Introduction
PHT100	ENGINEERING PHYSICS A	3-1-0:4	2019

No.	Course Outcome - PHT100 - ENGINEERING PHYSICS A	Target
CO1	Compute the quantitative aspects of waves and oscillations in engineering systems.	58%
CO2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.	58%
CO3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.	58%
CO4	Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems	58%
CO5	Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system	58%

COURSE END SURVEY - PHT100 - ENGINEERING PHYSICS A

Sl.No	Questions & Options
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CO1	To what extent are you able to compute the quantitative aspects of waves and oscillations in engineering systems ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to apply interference and diffraction in different natural optical processes and optical instruments ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to analyze the behavior of matter in the atomic and subatomic level through the principles of quantum mechanics ?. How can it be used to perceive the microscopic processes in electronic devices ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to apply the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - PHT100 - ENGINEERING PHYSICS A

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		1								
CO2	3	2		1								
CO3	3	2		1								
CO4	3	1		1								
CO5	3	1		1								

CO->PSO MAPPING - PHT100 - ENGINEERING PHYSICS A

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - PHT100 - ENGINEERING PHYSICS A

PHT100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2		1								

COURSE->PSO MAPPING - PHT100 - ENGINEERING PHYSICS A

PHT100/PSO	PSO1	PSO2	PSO3

SEMESTER-2**MA102**

Course Code	Course Name	L-T-P:C	Year of Introduction
MA102	Differential Equations	3-1-0:4	2016

No.	Course Outcome - MA102 - Differential Equations	Target
CO1	Demonstrate the use of homogeneous differential equations for the solution of engineering problems	62%
CO2	Solve non-homogeneous ordinary differential equations	60%
CO3	Demonstrate the properties and use of Fourier series and Euler's formulas	60%
CO4	Illustrate the use of Partial differential equations and their solutions	62%
CO5	Apply partial differential equations and Fourier series to solve one - dimensional wave equations	60%
CO6	Apply partial differential equations and Fourier series to solve one - dimensional heat equations	60%

COURSE END SURVEY - MA102 - Differential Equations

Sl.No	Questions & Options
CO1	To what extent you are able to demonstrate the use of homogeneous differential equations for the solution of engineering problems
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to solve non-homogeneous ordinary differential equations
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to demonstrate the properties and use of Fourier series and Euler's formulas
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to illustrate the use of Partial differential equations and their solutions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to apply partial differential equations and Fourier series to solve one - dimensional wave equations
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to apply partial differential equations and Fourier series to solve one - dimensional heat equations

Answer Choice- *Excellent/Very Good/Good Satisfactory/Needs improvement*

CO->PO MAPPING - MA102 - Differential Equations

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3							2	2
CO2	3	3	3	2							2	
CO3	3	3	3	3							2	
CO4	3	3	3	2							2	
CO5	3	3	3	2							2	
CO6	3	3	3	2							2	

CO->PSO MAPPING - MA102 - Differential Equations

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
CO6	3	2	

COURSE->PO MAPPING - MA102 - Differential Equations

MA102/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3							2	2

COURSE->PSO MAPPING - MA102 - Differential Equations

MA102/PSO	PSO1	PSO2	PSO3
	3	2	

CY100

Course Code	Course Name	L-T-P:C	Year of Introduction
CY100	Engineering Chemistry	3-1-0:4	2016

No.	Course Outcome - CY100 - Engineering Chemistry	Target
CO1	Demonstrate the principles of spectroscopy and apply them to explain chemical phenomena	65%
CO2	Illustrate principles and applications of various electrochemical techniques and cells.	65%

CO3	Describe instrumental methods like chromatography, conductivity and thermal analysis for chemical analysis.	60%
CO4	Recognize the properties and applications of engineering materials, such as polymers and nanomaterials	65%
CO5	Evaluate the properties of complex chemicals such as fuels and lubricants.	65%
CO6	Describe the properties of water and identify methods for water purification	65%

COURSE END SURVEY - CY100 - Engineering Chemistry

Sl.No	Questions & Options
CO1	To what extent you are able to explain the principles of spectroscopy and apply them to explain chemical phenomena
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to explain the principles and applications of various electrochemical techniques and cells.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to apply instrumental methods like chromatography, conductivity and thermal analysis for chemical analysis.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to recognize the properties and applications of engineering materials, such as polymers and nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to evaluate the properties of complex chemicals such as fuels and lubricants.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to describe the properties of water and identify methods for water purification
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CY100 - Engineering Chemistry

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	3	3	3					3
CO2	3	3	2		3							
CO3	3		2		3			2				
CO4	3	2	2	2	3							
CO5	3	2	2		3							
CO6	3	2	2			3						2

CO->PSO MAPPING - CY100 - Engineering Chemistry

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - CY100 - Engineering Chemistry

CY100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	3	3	3	2				3

COURSE->PSO MAPPING - CY100 - Engineering Chemistry

CY100/PSO	PSO1	PSO2	PSO3

ME100

Course Code	Course Name	L-T-P:C	Year of Introduction
ME100	Basics of Mechanical Engineering	2-1-0:3	2016

No.	Course Outcome - ME100 - Basics of Mechanical Engineering	Target
CO1	Compare various cycles involved in different thermodynamic processes	61%
CO2	Analyze the working of various energy conversion devices	61%
CO3	Apply basic thermodynamic principles to refrigeration and air conditioning systems	61%
CO4	Discuss different parts of an automobile and related power transmission devices	61%
CO5	Demonstrate working knowledge on manufacturing processes and machining operations	61%

COURSE END SURVEY - ME100 - Basics of Mechanical Engineering

Sl.No	Questions & Options
CO1	Students were able to understand various thermodynamic processes and cycles.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO2	Students came to know and learn about various turbines, pumps, boilers and other energy conversion devices
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO3	Students learnt basics and working of various refrigeration systems.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO4	Students got acquainted with parts of an automobile and its power transmission systems.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO5	Students were able to learn about various manufacturing processes and machines used for manufacturing.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO->PO MAPPING - ME100 - Basics of Mechanical Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1							2
CO2	3	2	2	2	1							2
CO3	3	2	2	2	1							2
CO4	3	2	1	1	1							2
CO5	3	2	2	2	1							2

CO->PSO MAPPING - ME100 - Basics of Mechanical Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	

COURSE->PO MAPPING - ME100 - Basics of Mechanical Engineering

ME100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	2	1							2

COURSE->PSO MAPPING - ME100 - Basics of Mechanical Engineering

ME100/PSO	PSO1	PSO2	PSO3
	3	1	

BE110

Course Code	Course Name	L-T-P:C	Year of Introduction
BE110	Engineering Graphics	1-1-2:3	2016

No.	Course Outcome - BE110 - Engineering Graphics	Target
CO1	Demonstrate Engineering Drawing Standards (as per BIS), dimensioning and preparation of drawings leading to illustration of Graphics as the communication language of Engineers	62%
CO2	Interpret engineering drawings, leading to enhanced presentation skills of 3-D objects in 2-D plane / paper and improved visualization of physical objects.	62%
CO3	Apply the principles of orthographic projections of lines, solids and sectioned views in the design of pipeline systems.	62%
CO4	Prepare isometric and perspective projections that help to reconstruct solutions to real-time engineering problems in 3D to provide better understanding.	62%
CO5	Create surface development and generate projections of penetrated objects which will help to develop suitable models for industrial applications.	62%
CO6	Recognize the importance of CAD software, and develop AutoCAD skills to transfer technical data and sketches into electronic drawing.	62%

COURSE END SURVEY - BE110 - Engineering Graphics

Sl.No	Questions & Options
CO1	To what extent you are able to demonstrate engineering drawing standards (as per BIS), dimensioning and preparation of drawings leading to illustration of graphics as the communication language of engineers
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to interpret engineering drawings, leading to enhanced presentation skills of 3-D objects in 2-D plane / paper and improved visualization of physical objects.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to apply the principles of orthographic projections of lines, solids and sectioned views in the design of pipeline systems.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to prepare isometric and perspective projections that help to reconstruct solutions to real-time engineering problems in 3D to provide better understanding.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to create surface development and generate projections of penetrated objects which will help to develop suitable models for industrial applications.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to recognize the importance of CAD software, and develop AutoCAD skills to transfer technical data and sketches into electronic drawing.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - BE110 - Engineering Graphics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3			2		2	1	2		3

CO2	3	2	2		3	2				3		2
CO3	3	2			3					2		2
CO4	3	2	3	1	1					2		2
CO5	3	2	2	1	3					2		2
CO6	2	3	2	1	3	2				3	3	2

CO->PSO MAPPING - BE110 - Engineering Graphics

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	
CO6	3	1	

COURSE->PO MAPPING - BE110 - Engineering Graphics

BE110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	3	2		2	1	3	3	3

COURSE->PSO MAPPING - BE110 - Engineering Graphics

BE110/PSO	PSO1	PSO2	PSO3
	3	1	

EC110

Course Code	Course Name	L-T-P:C	Year of Introduction
EC110	Electronics Engineering Workshop	0-0-2:1	2016

No.	Course Outcome - EC110 - Electronics Engineering Workshop	Target
CO1	Identify and select necessary components used in various electronic circuits and testing using a multimeter	76%
CO2	Generate waveforms with required frequency and amplitude using function generator and measure voltage, frequency and phase of any waveform using CRO.	72%
CO3	Analyze characteristics of simple circuits like rectifiers, multivibrators ,logic gates using transistors etc using bread board and soldering	72%
CO4	Demonstrate the working of Public Address System	72%

CO5	To simulate electronics circuits using LTSPICE and study the response	72%
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COURSE END SURVEY - EC110 - Electronics Engineering Workshop

Sl.No	Questions & Options
CO1	To what extent you are able to identify and select necessary components used in various electronic circuits and testing using a multimeter
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extent you are able to generate waveforms with required frequency and amplitude using function generator and measure voltage, frequency and phase of any waveform using CRO.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extent you are able to analyze characteristics of simple circuits like rectifiers, multivibrators ,logic gates using transistors etc using bread board and soldering
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extent you are able to demonstrate the working of Public Address System
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	To what extent you are able to to simulate electronics circuits using LTSPICE and study the response
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - EC110 - Electronics Engineering Workshop

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3				3				3	2		2
CO2	3		2		2				3	2		
CO3	3				2				3	2		
CO4	3		3		2	2			3	2		
CO5	3	2	3		2				3	2		

CO->PSO MAPPING - EC110 - Electronics Engineering Workshop

CO/PSO	PSO1	PSO2	PSO3
CO1	2		1
CO2	2		1
CO3	2		1
CO4	2		1
CO5	2		1

COURSE->PO MAPPING - EC110 - Electronics Engineering Workshop

EC110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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	3	2	3		3	2			3	2		2
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COURSE->PSO MAPPING - EC110 - Electronics Engineering Workshop

EC110/PSO	PSO1	PSO2	PSO3
	2		1

BE102

Course Code	Course Name	L-T-P:C	Year of Introduction
BE102	Design & Engineering	2-0-2:3	2016

No.	Course Outcome - BE102 - Design & Engineering	Target
CO1	Identify the different elements involved in good designs and practice them when called for.	66%
CO2	Solve the different stages of Design and formulate detailed designs with solid modeling and visualization.	66%
CO3	Develop the prototype and propose various stages towards final product design.	62%
CO4	Build a broader perspective of design covering the function, cost, environmental sensitivity, safety and factors other than from engineering analysis	62%
CO5	Identify product oriented and user oriented aspects that make the customer required design.	60%
CO6	Utilize various modern engineering methods and build basic knowledge of Intellectual Property Rights.	62%

COURSE END SURVEY - BE102 - Design & Engineering

Sl.No	Questions & Options
CO1	How far you have been able to identify the different elements involved in good designs and practice them when called for?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	How far you have been able to solve the different stages of design and formulate detailed designs with solid modeling and visualization?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	How far you have been able to develop the prototype and propose various stages towards final product design.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How far you have been able to build a broader perspective of design covering the function, cost, environmental sensitivity, safety and factors other than from engineering analysis
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	How far you have been able to Identify product oriented and user oriented aspects that make the customer required design?

	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	How far you have been able to utilize various modern engineering methods and build basic knowledge of Intellectual Property Rights.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - BE102 - Design & Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3		2	3	2	3		2		
CO2	3	2	3		2				2	3		
CO3	3	2	3		2				3	3	3	
CO4	3	2	3		2	2	3	3		2		
CO5	3	2	3		2							
CO6	3	2	3	2	2	2		3		3		3

CO->PSO MAPPING - BE102 - Design & Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			3
CO2	2	2	
CO3	2	2	
CO4			3
CO5	2	2	
CO6	2	2	2

COURSE->PO MAPPING - BE102 - Design & Engineering

BE102/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	2	2	3	3	3	3	3	3	3

COURSE->PSO MAPPING - BE102 - Design & Engineering

BE102/PSO	PSO1	PSO2	PSO3
	2	2	3

CY110

Course Code	Course Name	L-T-P:C	Year of Introduction
CY110	Engineering Chemistry Lab	0-0-2:1	2016

No.	Course Outcome - CY110 - Engineering Chemistry Lab	Target
CO1	Analyse and measure the quality of water and environmental pollution.	70%
CO2	Analyse and identify unknown compounds from spectral measurements.	70%
CO3	Prepare different polymers for industrial applications.	70%
CO4	Find the strength and pH of unknown solutions using different instrumental methods.	70%
CO5	Measure the percentage of metal present in metal ore.	70%
CO6	Apply and demonstrate theoretical concepts of Engineering Chemistry.	70%

COURSE END SURVEY - CY110 - Engineering Chemistry Lab

Sl.No	Questions & Options
CO1	To what extent you are able to analyse and measure the quality of water and environmental pollution.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to analyse and identify unknown compounds from spectral measurements.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to prepare different polymers for industrial applications.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to find the strength and pH of unknown solutions using different instrumental methods.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to measure the percentage of metal present in metal ore.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to apply and demonstrate theoretical concepts of Engineering Chemistry.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CY110 - Engineering Chemistry Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	3	3	3		2	2		2
CO2	3	2		2					2	2		
CO3	3	2	2	2					2	2	3	3
CO4	3	2	3	2	3				2	2		
CO5	3	2	3		3				2	2		
CO6	3	2	3		3	3				2	1	2

CO->PSO MAPPING - CY110 - Engineering Chemistry Lab

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - CY110 - Engineering Chemistry Lab

CY110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	2	3	3	3		2	2	3	3

COURSE->PSO MAPPING - CY110 - Engineering Chemistry Lab

CY110/PSO	PSO1	PSO2	PSO3

BE100

Course Code	Course Name	L-T-P:C	Year of Introduction
BE100	Engineering Mechanics	3-1-0:4	2016

No.	Course Outcome - BE100 - Engineering Mechanics	Target
CO1	Analyse reactions of various supports under equilibrium	55%
CO2	Determine the forces in planar and spatial systems	55%
CO3	Comprehend the properties of planes and solids	55%
CO4	Determine friction under static conditions	55%
CO5	Identify basic concepts of dynamic problems	55%

COURSE END SURVEY - BE100 - Engineering Mechanics

Sl.No	Questions & Options
CO1	To what extend you are able to determine the reactions of various supports under equilibrium condition
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extend you are able to determine the forces in planar and spatial systems
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
	How far you are able to comprehend the properties of planes and solids

CO3	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	How far you are able to determine the friction under static conditions
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	How far you are able to identify the basic concepts of dynamic problems
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - BE100 - Engineering Mechanics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2							2
CO2	3	2		3	2							2
CO3	3	2	2	3	2						3	2
CO4	3	2		3	2						3	2
CO5	3	2		3	2							2

CO->PSO MAPPING - BE100 - Engineering Mechanics

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - BE100 - Engineering Mechanics

BE100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	3	2						3	2

COURSE->PSO MAPPING - BE100 - Engineering Mechanics

BE100/PSO	PSO1	PSO2	PSO3

EE100

Course Code	Course Name	L-T-P:C	Year of Introduction
EE100	Basics of Electrical Engineering	2-1-0:3	2016

No.	Course Outcome - EE100 - Basics of Electrical Engineering	Target
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CO1	Summarize the basics of electrical engineering applied to various engineering problems	60%
CO2	Perform mathematical analysis of electric circuits and their power measurement	55%
CO3	Illustrate the basics of magnetism and apply them to electric machines	55%
CO4	Assess the basic structure of machines and power systems	60%
CO5	Evaluate the basic circuits and machines used in real world	60%

COURSE END SURVEY - EE100 - Basics of Electrical Engineering

Sl.No	Questions & Options
CO1	To what extend you are able to understand the the basics of electrical engineering
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend you are able to Perform mathematical analysis of electric circuits and its power measurement
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend you are able to illustrate the basics of magnetism and apply it to electric machines
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend you are able to understand the basic structure of machines and power systems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend you are able to evaluate the basic circuits and machines used in real world
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - EE100 - Basics of Electrical Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3			3							2	
CO2	3			3							2	
CO3	3			3							2	
CO4	3			3							2	
CO5	3			3	3						2	

CO->PSO MAPPING - EE100 - Basics of Electrical Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			

CO5			
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COURSE->PO MAPPING - EE100 - Basics of Electrical Engineering

EE100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3			3	3						2	

COURSE->PSO MAPPING - EE100 - Basics of Electrical Engineering

EE100/PSO	PSO1	PSO2	PSO3

EC100

Course Code	Course Name	L-T-P:C	Year of Introduction
EC100	Basics of Electronics Engineering	2-1-0:3	2016

No.	Course Outcome - EC100 - Basics of Electronics Engineering	Target
CO1	Identify and select necessary components used in various electronic circuits.	60.5%
CO2	Design and organize simple circuits using different types of diodes and transistors	60.5%
CO3	Demonstrate the working of analog circuits such as rectifiers, amplifiers and oscillators.	60.5%
CO4	Illustrate the working of basic building blocks of analog and digital systems such as Operational amplifiers and Logic gates.	60.5%
CO5	Demonstrate the use of basic measuring instruments used in electronics work.	60.5%
CO6	Compare and contrast various modulation techniques, communication systems and TV signal transmission techniques.	60.5%

COURSE END SURVEY - EC100 - Basics of Electronics Engineering

Sl.No	Questions & Options
CO1	To what extent you are able to identify and select necessary components used in various electronic circuits.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extent you are able to design and organize simple circuits using different types of diodes and transistors
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extent you are able to demonstrate the working of analog circuits such as rectifiers, amplifiers and oscillators.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extent you are able to Illustrate the working of basic building blocks of analog and digital systems such as Operational amplifiers and Logic gates.

	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	To what extent you are able to demonstrate the use of basic measuring instruments used in electronics work.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO6	To what extent you are able to compare and contrast various modulation techniques, communication systems and TV signal transmission techniques.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - EC100 - Basics of Electronics Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											2
CO2	3		3									2
CO3	3											
CO4	3		3									3
CO5	3			2								
CO6	3				2							2

CO->PSO MAPPING - EC100 - Basics of Electronics Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - EC100 - Basics of Electronics Engineering

EC100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3		3	2	2							3

COURSE->PSO MAPPING - EC100 - Basics of Electronics Engineering

EC100/PSO	PSO1	PSO2	PSO3

PH100

Course Code	Course Name	L-T-P:C	Year of Introduction
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PH100	Engineering Physics	3-1-0:4	2016
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No.	Course Outcome - PH100 - Engineering Physics	Target
CO1	Analyse different phenomena associated with the generation and propagation of oscillations and waves	62%
CO2	Demonstrate wave-like phenomena associated with light and use them to measure its properties	62%
CO3	Illustrate the phenomenon of superconductivity and evaluate the properties of the superconducting state	62%
CO4	Identify the features of quantum and statistical phenomena and demonstrate the dynamics of microscopic entities.	57%
CO5	Describe the production and properties of acoustic and ultrasonic waves and demonstrate their applications.	62%
CO6	Outline the construction and properties of different lasers and optoelectronic devices, and identify their applications	62%

COURSE END SURVEY - PH100 - Engineering Physics

Sl.No	Questions & Options
CO1	To what extent you are able to analyse different phenomena associated with the generation and propagation of oscillations and waves
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to demonstrate wave-like phenomena associated with light and use them to measure its properties
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to illustrate the phenomenon of superconductivity and evaluate the properties of the superconducting state
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to Identify the features of quantum and statistical phenomena and demonstrate the dynamics of microscopic entities.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to describe the production and properties of acoustic and ultrasonic waves and demonstrate their applications.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to outline the construction and properties of different lasers and optoelectronic devices, and identify their applications
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - PH100 - Engineering Physics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	3	2	1	2	2		1			1	2	1
CO2	3	2	1	2	2				1		1	1
CO3	3	2	1	2	2	1	1		1		1	1
CO4	3	2	1	2	2				1		2	
CO5	3	2	1	2	3	1	1		1	2	1	1
CO6	3	2	1	2	3	1			1	2	1	2

CO->PSO MAPPING - PH100 - Engineering Physics

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	1	1	
CO3	2		
CO4	2		
CO5	1	1	1
CO6	2	2	1

COURSE->PO MAPPING - PH100 - Engineering Physics

PH100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	1	2	3	1	1		1	2	2	2

COURSE->PSO MAPPING - PH100 - Engineering Physics

PH100/PSO	PSO1	PSO2	PSO3
	3	2	1

PH110

Course Code	Course Name	L-T-P:C	Year of Introduction
PH110	Engineering Physics Lab	0-0-2:1	2016

No.	Course Outcome - PH110 - Engineering Physics Lab	Target
CO1	Measure basic physical quantities, such as voltage, frequency, temperature etc and evaluate measurement accuracy.	70%
CO2	Measure and analyse the properties of electrical and acoustic waves and oscillations, and demonstrate resonance.	70%
CO3	Demonstrate wave-like properties of light and measure the wavelength of monochromatic light sources	70%

CO4	Illustrate the propagation of light through an optical fibre and measure its numerical aperture	70%
CO5	Demonstrate the working of devices such as solar cells and photoelectric cells	70%
CO6	Organize an experimental set up and measure fundamental constants such as the Planck's constant.	70%

COURSE END SURVEY - PH110 - Engineering Physics Lab

Sl.No	Questions & Options
CO1	To what extent you are able to Measure basic physical quantities, such as voltage, frequency, temperature etc and evaluate measurement accuracy.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extent you are able to measure and analyse the properties of electrical and acoustic waves and oscillations, and demonstrate resonance.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent you are able to demonstrate wave-like properties of light and measure the wavelength of monochromatic light sources
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extent you are able to illustrate the propagation of light through an optical fibre and measure its numerical aperture
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent you are able to demonstrate the working of devices such as solar cells and photoelectric cells
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	To what extent you are able to organize an experimental set up and measure fundamental constants such as the Planck's constant.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - PH110 - Engineering Physics Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2	1		2	2	3	2	
CO2	3	3	3	2	2		1	2	1	2	1	2
CO3	3	3	2	2	2							
CO4	3	3	1	2	2	1	1		1	1	1	1
CO5	3	2	3	2	2	1	2	1	1	1	1	1
CO6	3	3	1	2	3						1	

CO->PSO MAPPING - PH110 - Engineering Physics Lab

CO/PSO	PSO1	PSO2	PSO3
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CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3
CO6	3	3	

COURSE->PO MAPPING - PH110 - Engineering Physics Lab

PH110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	3	1	2	2	2	3	2	2

COURSE->PSO MAPPING - PH110 - Engineering Physics Lab

PH110/PSO	PSO1	PSO2	PSO3
	3	3	3

ME110

Course Code	Course Name	L-T-P:C	Year of Introduction
ME110	Mechanical Engineering Workshops	0-0-2:1	2016

No.	Course Outcome - ME110 - Mechanical Engineering Workshops	Target
CO1	Demonstrate various manufacturing processes in a basic mechanical engineering workshop, like smithy, carpentry, foundry and fitting	75%
CO2	Identify various hand tools used in basic mechanical engineering workshop sections, like smithy, carpentry, foundry and fitting.	75%
CO3	Choose different measuring devices necessary to carry out work in a workshop.	75%
CO4	Demonstrate the operations of various machine tools like lathe, milling, drilling and shaping machines.	75%
CO5	Assemble and disassemble machines like IC engines.	75%
CO6	Construct models using basic mechanical workshop sections involving welding, moulding, smithy, carpentry etc.	75%

COURSE END SURVEY - ME110 - Mechanical Engineering Workshops

Sl.No	Questions & Options
CO1	Did you get the basic idea about smithy, carpentry, foundry and fitting
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
	Can you choose the apt tool for a particular operation in the four sections

CO2	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	Are you able to select the proper measuring device required for a job
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO4	Do you have a basic idea about the machine tools like lathe, milling, drilling and shaping machines
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	Can you assemble and disassemble a piston and cylinder of an IC Engine
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	Can you choose tools and do a model independently
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - ME110 - Mechanical Engineering Workshops

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2		2	2	1	1	3	2		1
CO2	2	2	2		2	2	1	1	3	2		1
CO3	2	2	2		2	2	1	1	3	2		1
CO4	2	2	2		2	2	1	1	3	2		1
CO5	3	2	2		2	2			3	2		1
CO6	3	1	2		3	2	1	1	3	2		1

CO->PSO MAPPING - ME110 - Mechanical Engineering Workshops

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	2		
CO3	2		
CO4	2		
CO5	3		
CO6	3		

COURSE->PO MAPPING - ME110 - Mechanical Engineering Workshops

ME110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2		3	2	1	1	3	2		1

COURSE->PSO MAPPING - ME110 - Mechanical Engineering Workshops

	PSO1	PSO2	PSO3

ME110/PSO	3		
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MAT102

Course Code	Course Name	L-T-P:C	Year of Introduction
MAT102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0:4	2019

No.	Course Outcome - MAT102 - VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	Target
CO1	Apply the concept of vector functions and learn to work with conservative vector field	60%
CO2	Evaluate surface and volume integrals and study their relationship and applications	60%
CO3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients	60%
CO4	Use Laplace transform for engineering applications specially for ODEs arising from engineering problems	60%
CO5	Utilize Fourier transforms to solve physical problems arising in engineering	60%

COURSE END SURVEY - MAT102 - VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

Sl.No	Questions & Options
CO1	To what extend are you able to apply the concept of vector functions and learn to work with conservative vector field
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extend are you able to evaluate surface and volume integrals and study their relationship and applications
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extend are you able to solve homogeneous and non-homogeneous linear differential equation with constant coefficients
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extend are you able to use Laplace transform for engineering applications specially for ODEs arising from engineering problems
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extend are you able to utilize Fourier transforms to solve physical problems arising in engineering
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - MAT102 - VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	3	3							1			
CO2	3	3							1			
CO3	3	3							1			
CO4	3	3							1			
CO5	3	3							1			

CO->PSO MAPPING - MAT102 - VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - MAT102 - VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

MAT102/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3							1			

COURSE->PSO MAPPING - MAT102 - VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

MAT102/PSO	PSO1	PSO2	PSO3

CYT100

Course Code	Course Name	L-T-P:C	Year of Introduction
CYT100	ENGINEERING CHEMISTRY	3-1-0:4	2019

No.	Course Outcome - CYT100 - ENGINEERING CHEMISTRY	Target
CO1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields	61%
CO2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.	68%
CO3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.	64%
CO4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.	67%
CO5	Study various types of water treatment methods to develop skills for treating wastewater	65%

COURSE END SURVEY - CYT100 - ENGINEERING CHEMISTRY

Sl.No	Questions & Options
CO1	To what extent you understand the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent the spectroscopic techniques were found useful for various applications?
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO3	How the analytical techniques was found useful for chemical analysis?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How far you are familiarised to apply the knowledge of polymers for engineering applications?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	Was it helpful for you to apply the knowledge of water treatment methods for societal improvement?
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>

CO->PO MAPPING - CYT100 - ENGINEERING CHEMISTRY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1									
CO2	1	1		1	2							
CO3	1	1		1	2							
CO4	2	1										
CO5	1			1			3					

CO->PSO MAPPING - CYT100 - ENGINEERING CHEMISTRY

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2			
CO3	1		
CO4			
CO5	2	2	

COURSE->PO MAPPING - CYT100 - ENGINEERING CHEMISTRY

CYT100/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	1	1	2		3					

COURSE->PSO MAPPING - CYT100 - ENGINEERING CHEMISTRY

CYT100/PSO	PSO1	PSO2	PSO3
	2	2	

CYL120

Course Code	Course Name	L-T-P:C	Year of Introduction
CYL120	ENGINEERING CHEMISTRY LAB	0-0-2:1	2019

No.	Course Outcome - CYL120 - ENGINEERING CHEMISTRY LAB	Target
CO1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses	75%
CO2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs	78%
CO3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds	80%
CO4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis	77%
CO5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments	74%

COURSE END SURVEY - CYL120 - ENGINEERING CHEMISTRY LAB

Sl.No	Questions & Options
CO1	To what extent students will be able to apply knowledge about chemical analysis techniques?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	How far students developed their skills in polymer synthesis?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extent students can apply their knowledge in compound analysis using various spectroscopic techniques?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How far the students benefited from understanding the concepts of instrumental techniques?
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO5	How will you evaluate the skills acquired by doing engineering chemistry experiments?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>

CO->PO MAPPING - CYL120 - ENGINEERING CHEMISTRY LAB

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		2				3			3

CO2	3				3				3			3
CO3	3				3				3			3
CO4	3				3				3			3
CO5	3				1				3			3

CO->PSO MAPPING - CYL120 - ENGINEERING CHEMISTRY LAB

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - CYL120 - ENGINEERING CHEMISTRY LAB

CYL120/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2		3				3			3

COURSE->PSO MAPPING - CYL120 - ENGINEERING CHEMISTRY LAB

CYL120/PSO	PSO1	PSO2	PSO3

EST102

Course Code	Course Name	L-T-P:C	Year of Introduction
EST102	PROGRAMMING IN C	2-1-2:4	2019

No.	Course Outcome - EST102 - PROGRAMMING IN C	Target
CO1	Analyse a computational problem and develop an algorithm/ flow chart to find its solution.	56%
CO2	Develop C programs with branching and looping statements which uses Arithmetic, Logical, Relational or Bitwise operators.	56%
CO3	Develop C programs using arrays, structure and union for storing the data to be processed.	56%
CO4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem.	56%
CO5	Develop C programs which use pointers for array processing and parameter passing	56%
CO6	Develop C programs with files for reading input and storing output.	56%

COURSE END SURVEY - EST102 - PROGRAMMING IN C

Sl.No	Questions & Options
CO1	Are you able to analyse a computational problem and develop an algorithm/ flow chart to find its solution?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	Are you able to develop C programs with branching and looping statements which uses Arithmetic , Logical , Relational or Bitwise operators?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	Are you able to develop C programs with arrays , structure or union for storing the data to be processed?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	Are you able to divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	Are you able to develop C programs which use pointers for array processing and parameter passing?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO6	Are you able to develop C programs with files for reading input and storing output?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - EST102 - PROGRAMMING IN C

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3		2				3		3
CO2	3	3	3	2	3							2
CO3	3	3	3	2	3							2
CO4	3	3	3	3	3					3		3
CO5	3	3			3							2
CO6	3	3			3							2

CO->PSO MAPPING - EST102 - PROGRAMMING IN C

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - EST102 - PROGRAMMING IN C

EST102/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	2				3		3

COURSE->PSO MAPPING - EST102 - PROGRAMMING IN C

EST102/PSO	PSO1	PSO2	PSO3

EST110

Course Code	Course Name	L-T-P:C	Year of Introduction
EST110	ENGINEERING GRAPHICS	2-0-2:3	2019

No.	Course Outcome - EST110 - ENGINEERING GRAPHICS	Target
CO1	Demonstrate Engineering Drawing Standards (as per BIS), dimensioning and preparation of drawings leading to illustration of Graphics as the communication language of Engineers	65%
CO2	Interpret engineering drawings, leading to enhanced presentation skills of 3-D objects in 2-D plane / paper and improved visualization of physical objects.	65%
CO3	Apply the principles of orthographic projections of lines, solids and sectioned views in the design of pipeline systems.	65%
CO4	Prepare isometric and perspective projections that help to reconstruct solutions to real-time engineering problems in 3D to provide better understanding.	65%
CO5	Create surface development of objects which will help to develop suitable models for industrial applications.	65%
CO6	Recognize the importance of CAD software, and develop AutoCAD skills to transfer technical data and sketches into electronic drawing.	65%

COURSE END SURVEY - EST110 - ENGINEERING GRAPHICS

Sl.No	Questions & Options
CO1	To what extent you are able to demonstrate Engineering Drawing Standards (as per BIS), dimensioning and preparation of drawings leading to illustration of Graphics as the communication language of Engineers?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to interpret engineering drawings, leading to enhanced presentation skills of 3-D objects in 2-D plane / paper and improved visualization of physical objects?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to apply the principles of orthographic projections of lines, solids and sectioned views in the design of pipeline systems?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to prepare isometric and perspective projections that help to reconstruct solutions to real-time engineering problems in 3D to provide better understanding?

	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to create surface development and generate projections of penetrated objects which will help to develop suitable models for industrial applications?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to recognize the importance of CAD software, and develop AutoCAD skills to transfer technical data and sketches into electronic drawing?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - EST110 - ENGINEERING GRAPHICS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2			2		3		3		
CO2	2	3	2	2	2	2		2		3		3
CO3	3	2	2	2				2		3		
CO4	3	2	2	2						3		2
CO5	3	2	2			1				3		2
CO6		3	2	3	2	3				3		3

CO->PSO MAPPING - EST110 - ENGINEERING GRAPHICS

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - EST110 - ENGINEERING GRAPHICS

EST110/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	3	2	3		3		3		3

COURSE->PSO MAPPING - EST110 - ENGINEERING GRAPHICS

EST110/PSO	PSO1	PSO2	PSO3

EST120

Course Code	Course Name	L-T-P:C	Year of Introduction
EST120	BASICS OF CIVIL & MECHANICAL ENGINEERING	2-0-0:4	2019

No.	Course Outcome - EST120 - BASICS OF CIVIL & MECHANICAL ENGINEERING	Target
CO1	Discuss the relevance of Civil Engineering, buildings and its codal provisions	65%
CO2	Comprehend the concept of surveying and identify various building materials	65%
CO3	Examine the different components of a building and identify type of construction to be employed	65%
CO4	Compare various cycles involved in different thermodynamic processes	60%
CO5	Analyze different power transmission devices	60%
CO6	Demonstrate working knowledge on manufacturing processes and machining operations	60%

COURSE END SURVEY - EST120 - BASICS OF CIVIL & MECHANICAL ENGINEERING

Sl.No	Questions & Options
CO1	to what extend you understood the relevance of civil engineering, buildings and its codal provisions?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	how much you will be able to understand the concept of surveying and identify various building materials?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	to what extend you are able to identify type of construction to be employed and different components of a building?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	how much you are able to compare the cycles involve different thermodynamic process?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	to what extend you are able to analyse power transmission devices?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	to what extend you understand about manufacturing process and machining operations?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - EST120 - BASICS OF CIVIL & MECHANICAL ENGINEERING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1			2	2	1		1	1	
CO2	1					1	1			1		1
CO3	2	1	1									1
CO4	3		1							1		

CO5		1	1			1			1			
CO6	1		1					1				

CO->PSO MAPPING - EST120 - BASICS OF CIVIL & MECHANICAL ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
CO1			1
CO2	1	1	
CO3	1		
CO4	1	1	
CO5		1	
CO6			1

COURSE->PO MAPPING - EST120 - BASICS OF CIVIL & MECHANICAL ENGINEERING

EST120/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	1			2	2	1	1	1	1	1

COURSE->PSO MAPPING - EST120 - BASICS OF CIVIL & MECHANICAL ENGINEERING

EST120/PSO	PSO1	PSO2	PSO3
	1	1	1

ESL120

Course Code	Course Name	L-T-P:C	Year of Introduction
ESL120	CIVIL & MECHANICAL WORKSHOP	0-0-2:1	2019

No.	Course Outcome - ESL120 - CIVIL & MECHANICAL WORKSHOP	Target
CO1	Apply the modern measuring techniques for linear, area, volume calculations and carry out setting out operations	65%
CO2	Compute the level difference between points	65%
CO3	Co-ordinate the work related to masonry , plumbing, sanitary fittings and design of rain water harvesting systems	65%
CO4	Demonstrate various manufacturing processes in basic mechanical engineering workshops like smithy, carpentry, foundry and fitting	65%
CO5	Demonstrate the operations of various machine tools like lathe, milling, drilling and shaping machines	65%
CO6	Assemble and disassemble machines like IC Engines	65%

COURSE END SURVEY - ESL120 - CIVIL & MECHANICAL WORKSHOP

Sl.No	Questions & Options
CO1	To what extent you are able to apply modern measuring techniques for linear, area and volume calculations and carry out setting out operations
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extent you are able to compute the level difference between points for a civil work
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent you are able to coordinate the work related to masonry, plumbing, sanitary fittings and design of rain water harvesting system for a residential building construction
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extent you are able to select smithy, carpentry, foundry and fitting for a particular engineering job
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent you are able to choose the various machine tools like lathe, milling, drilling and shaping machines for your machining requirement
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	To what extent you are able to assemble and disassemble simple machine components
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - ESL120 - CIVIL & MECHANICAL WORKSHOP

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	3	2				2	2		
CO2	2	2	3	3	2				2	2		
CO3	2	2	3	3	2				2	2		
CO4	2	2	3	3	2				2	2		
CO5	2	2	3	3	2				2	2		
CO6	2	2	3	3	2				2	2		

CO->PSO MAPPING - ESL120 - CIVIL & MECHANICAL WORKSHOP

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - ESL120 - CIVIL & MECHANICAL WORKSHOP

ESL120/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	3	3	2				2	2		

COURSE->PSO MAPPING - ESL120 - CIVIL & MECHANICAL WORKSHOP

ESL120/PSO	PSO1	PSO2	PSO3

HUN102

Course Code	Course Name	L-T-P:C	Year of Introduction
HUN102	PROFESSIONAL COMMUNICATION	2-0-2:4	2019

No.	Course Outcome - HUN102 - PROFESSIONAL COMMUNICATION	Target
CO1	Use vocabulary and language skills relevant to engineering as a profession.	65%
CO2	Analyze, interpret and effectively summarize a variety of textual content.	65%
CO3	Create effective technical presentations	65%
CO4	Discuss a given technical/ non-technical topic in a group setting and arrive at generalizations/consensus.	65%
CO5	Identify drawbacks in listening patterns and apply listening techniques for specific needs.	65%
CO6	Assess and create professional and technical documents that are clear and adhering to all the necessary conventions.	65%

COURSE END SURVEY - HUN102 - PROFESSIONAL COMMUNICATION

Sl.No	Questions & Options
CO1	To what extend can you develop and use vocabulary and language skills relevant to engineering profession?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extend can you analyze, interpret and summarize a variety of textual content effectively?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extend can you create effective technical presentations?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extend can you discuss about a given technical/ non- technical topic in a group setting and arrive at a consensus??
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	To what extend can you identify drawbacks in listening patterns and apply listening techniques for specific needs?

	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO6	To what extend can you assess and create professional and technical documents that are clear and adhering to all the necessary conventions?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - HUN102 - PROFESSIONAL COMMUNICATION

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1	1						3		3
CO2		2								3		3
CO3									3	3		
CO4										3		2
CO5		2							3	3		
CO6		2	2	2						3		

CO->PSO MAPPING - HUN102 - PROFESSIONAL COMMUNICATION

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - HUN102 - PROFESSIONAL COMMUNICATION

HUN102/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	2	2	2					3	3		3

COURSE->PSO MAPPING - HUN102 - PROFESSIONAL COMMUNICATION

HUN102/PSO	PSO1	PSO2	PSO3

SEMESTER-3**MA201**

Course Code	Course Name	L-T-P:C	Year of Introduction
MA201	Linear Algebra & Complex Analysis	3-1-0:4	2016

No.	Course Outcome - MA201 - Linear Algebra & Complex Analysis	Target
CO1	Identify and study analytic functions and harmonic functions	60%
CO2	Recognize conformal mapping and find regions that are mapped under certain transformations	60%
CO3	Evaluate contour integrals using the theory of complex variables	60%
CO4	Evaluate real definite integrals as an application of residue theorem	60%
CO5	Solve systems of equations	60%
CO6	Compute eigen values and diagonalise a matrix	60%

COURSE END SURVEY - MA201 - Linear Algebra & Complex Analysis

Sl.No	Questions & Options
CO1	To what extent are you able to identify and study analytic functions and harmonic functions ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to recognize conformal mapping and find regions that are mapped under certain transformations ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to evaluate contour integrals using the theory of complex variables ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to evaluate real definite integrals as application of residue theorem ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to solve systems of equations ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent are you able to compute eigen values and diagonalise a matrix
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - MA201 - Linear Algebra & Complex Analysis

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2				1			1
CO2	3	3	2	2	2				1			1
CO3	3	3	3	2	2				1			1
CO4	3	3	3	3	2				2			2
CO5	3	3	3	3	2				2			2
CO6	3	3	2	2	2				1			1

CO->PSO MAPPING - MA201 - Linear Algebra & Complex Analysis

CO/PSO	PSO1	PSO2	PSO3
CO1	2	2	
CO2	2	2	
CO3	2	3	
CO4	3	3	
CO5	3	3	
CO6	2	2	

COURSE->PO MAPPING - MA201 - Linear Algebra & Complex Analysis

MA201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2				2			2

COURSE->PSO MAPPING - MA201 - Linear Algebra & Complex Analysis

MA201/PSO	PSO1	PSO2	PSO3
	3	3	

CH201

Course Code	Course Name	L-T-P:C	Year of Introduction
CH201	Chemical Process Calculations	3-1-0:4	2016

No.	Course Outcome - CH201 - Chemical Process Calculations	Target
CO1	Convert physical quantities and empirical equations from one unit system to another.	60%
CO2	Report the composition of solid, liquid and gaseous mixtures in adequate unit systems	60%
CO3	Calculate physical properties of gases and liquids using equations of state and other basic laws.	60%
CO4	Compute properties of air- water vapour mixture from basic definitions and from Humidity chart.	60%
CO5	Develop and solve material balance equations for unit operations and processes.	60%
CO6	Develop and solve energy balance equations for unit operations and processes.	62%

COURSE END SURVEY - CH201 - Chemical Process Calculations

Sl.No	Questions & Options
CO1	To what extent you are able convert physical quantities and empirical equations from one unit system to another
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
	To what extent you are able to report the composition of solid, liquid and gaseous mixtures in adequate units

CO2	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to calculate physical properties of gases and liquids using equations of state and other basic laws.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to compute properties of air- water vapour mixture from basic definitions and from Humidity chart
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to develop and solve material balance equations for unit operations and processes
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to develop and solve energy balance equations for unit operations and processes
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH201 - Chemical Process Calculations

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	2	2		1				1	1
CO2	3	3	1	2	2	1	1				1	1
CO3	3	3	1	2	2	1	1				1	1
CO4	1	2	1	3	3	1	1				1	1
CO5	1	3	1	3	3	2	2				1	1
CO6	1	3	2	3	3	2	2				1	1

CO->PSO MAPPING - CH201 - Chemical Process Calculations

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	
CO2	3	3	
CO3	3	3	
CO4	3	3	
CO5	3	3	
CO6	3	3	

COURSE->PO MAPPING - CH201 - Chemical Process Calculations

CH201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	3	3	2	2				1	1

COURSE->PSO MAPPING - CH201 - Chemical Process Calculations

CH201/PSO	PSO1	PSO2	PSO3
	3	3	

CH203

Course Code	Course Name	L-T-P:C	Year of Introduction
CH203	Particle Technology	3-1-0:4	2016

No.	Course Outcome - CH203 - Particle Technology	Target
CO1	Evaluate the particle size distribution, mean particle diameter, specific surface area and number of particles per unit mass using techniques such as sieve analysis, pipette analysis and beaker decantation	66%
CO2	Identify the principles of free settling, hindered settling and mineral beneficiation techniques	66%
CO3	Apply the concepts of filtration theory and select appropriate filtration equipment	66%
CO4	Describe separation techniques for particulates in air	66%
CO5	Select suitable size reduction equipment and estimate the energy requirements for a specified reduction in size for a given material.	66%
CO6	Demonstrate mixing and conveying processes in chemical industries	66%

COURSE END SURVEY - CH203 - Particle Technology

Sl.No	Questions & Options
CO1	To what extent have you understood the concepts of characteristics of particles ?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	How far did you understand the principles of particle settling ?
	Answer Choice- Excellent/Very Good/Good Satisfactory/Needs improvement
CO3	To what extent have you understood the concepts of filtration theory and filtration equipment ?
	Answer Choice- Excellent/Very Good/Good/Satisfactory/Poor
CO4	How far have you understood the air separation techniques ?
	Answer Choice- Excellent/Very Good/Good Satisfactory/Needs improvement
CO5	To what extent have you understood the size reduction operations?
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO6	How far have you understood the mixing and conveying process in chemical industries ?
	Answer Choice- Excellent/Very Good/Good/Satisfactory/Poor

CO->PO MAPPING - CH203 - Particle Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1								
CO2	3	3	1	1								
CO3	3	3	1	3	2				1			1
CO4	1	1	1	1	2							
CO5	3	3	3	3	2				1			1
CO6	1	1	1	1	2							1

CO->PSO MAPPING - CH203 - Particle Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	2	3	
CO2	2	3	
CO3	2	3	
CO4	2	1	
CO5	2	3	
CO6	2	1	

COURSE->PO MAPPING - CH203 - Particle Technology

CH203/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2				1			1

COURSE->PSO MAPPING - CH203 - Particle Technology

CH203/PSO	PSO1	PSO2	PSO3
	2	3	

CH207

Course Code	Course Name	L-T-P:C	Year of Introduction
CH207	Chemistry for Process Engineering –I	2-1-0:3	2016

No.	Course Outcome - CH207 - Chemistry for Process Engineering –I	Target
CO1	Demonstrate the relevance of organic chemistry for chemical engineering practice	62%
CO2	Illustrate role of reactions in chemical engineering	66%
CO3	Identify and explain advanced synthetic reagents and mechanisms	64%

CO4	Demonstrate the importance of selected industrially used organic compounds	62%
CO5	Explain various aspects of chemistry of food and drugs and their composition	62%

COURSE END SURVEY - CH207 - Chemistry for Process Engineering –I

Sl.No	Questions & Options
CO1	To what extent you understand the relevance of organic chemistry in chemical engineering practice
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How far you are able to illustrate the role of reactions in chemical engineering
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to Identify and explain advanced synthetic reagents and mechanisms
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How much you are able to demonstrate the importance of selected industrially used organic compounds
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	How far you are able to explain various aspects of chemistry of food and drugs and their composition
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH207 - Chemistry for Process Engineering –I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1					2			2
CO2	3	3		2					1			2
CO3	3	3		2					1			2
CO4	2	2		1					1			2
CO5	2	2		1					1			2

CO->PSO MAPPING - CH207 - Chemistry for Process Engineering –I

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	1	
CO5	3	1	

COURSE->PO MAPPING - CH207 - Chemistry for Process Engineering –I

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CH207/PO	3	3		2					2			2
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COURSE->PSO MAPPING - CH207 - Chemistry for Process Engineering –I

CH207/PSO	PSO1	PSO2	PSO3
	3	2	

CH231

Course Code	Course Name	L-T-P:C	Year of Introduction
CH231	Chemistry Lab for Process Engineering	0-0-3:1	2016

No.	Course Outcome - CH231 - Chemistry Lab for Process Engineering	Target
CO1	Analyze and identify unknown organic compounds	68%
CO2	Prepare different organic compounds	68%
CO3	Analyze and estimate different organic compounds volumetrically	68%
CO4	Identify organic compounds using colorimetric methods	68%
CO5	Identify organic and biomaterials using chromatographic methods.	68%

COURSE END SURVEY - CH231 - Chemistry Lab for Process Engineering

Sl.No	Questions & Options
CO1	To what extent you are able to analyze and identify unknown organic compounds
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to prepare different organic compounds
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to analyze and estimate different organic compounds volumetrically
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to identify organic compounds using colorimetric methods
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to identify organic and biomaterials using chromatographic methods
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH231 - Chemistry Lab for Process Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				3	2	1			2	2	1	

CO2				3	2	1			2	2	1	
CO3				3	2	1			2	2	1	
CO4				3	2	1			2	2	1	
CO5				3	2	1			2	2	1	

CO->PSO MAPPING - CH231 - Chemistry Lab for Process Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	2	2	1
CO3	2	2	1
CO4	2	2	1
CO5	2	2	1

COURSE->PO MAPPING - CH231 - Chemistry Lab for Process Engineering

CH231/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
				3	2	1			2	2	1	

COURSE->PSO MAPPING - CH231 - Chemistry Lab for Process Engineering

CH231/PSO	PSO1	PSO2	PSO3
	2	2	1

CH205

Course Code	Course Name	L-T-P:C	Year of Introduction
CH205	Fluid and Particle Mechanics - I	3-1-0:4	2016

No.	Course Outcome - CH205 - Fluid and Particle Mechanics - I	Target
CO1	Identify various properties of fluids and different types of flow systems.	61%
CO2	Describe the principles of fluid statics, buoyancy and pressure measurements.	61%
CO3	Analyse the mathematical models for flow behaviour in different systems utilizing the principles of kinematics.	61%
CO4	Formulate mathematical models for application of mass, energy, and momentum conservation principles in fluid flow.	61%
CO5	Develop the basic fluid dynamic equations for incompressible fluids	61%
CO6	Assess suitability of different types of valves and measuring/metering devices for fluids	63%

COURSE END SURVEY - CH205 - Fluid and Particle Mechanics - I

Sl.No	Questions & Options
CO1	Are you able to identify different properties of fluids and flow behaviours?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	Will you be able to explain the principles of fluid statics?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent can you analyse mathematical models of flow using the methods of fluid kinematics?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO4	Will you be able to assess application of mass, energy, and momentum conservation equations in fluid flow systems?
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>
CO5	To what extent can you develop equations of flow for incompressible fluids?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO6	How confident are you in assessing suitability of different types of valves and measuring devices used in fluid handling?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CH205 - Fluid and Particle Mechanics - I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	1							
CO2	2	1	1	2	1							
CO3	3	3	3	2	3							
CO4	3	3	3	2	3							
CO5	3	3	2	2	3							
CO6			3									1

CO->PSO MAPPING - CH205 - Fluid and Particle Mechanics - I

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	3	
CO4	3	3	
CO5	3	3	
CO6	3		

COURSE->PO MAPPING - CH205 - Fluid and Particle Mechanics - I

CH205/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	3							1

COURSE->PSO MAPPING - CH205 - Fluid and Particle Mechanics - I

CH205/PSO	PSO1	PSO2	PSO3
	3	3	

CH233

Course Code	Course Name	L-T-P:C	Year of Introduction
CH233	Chemical Technology and Environmental Engg Lab	0-0-3:1	2016

No.	Course Outcome - CH233 - Chemical Technology and Environmental Engg Lab	Target
CO1	Determine various properties of oils such as acid value, iodine value and saponification value.	66%
CO2	Make soap and determine its important properties	66%
CO3	Find out the sucrose content of sugar and available chlorine content of bleaching powder	66%
CO4	Perform common environmental experiments to find the quality of water and wastewater samples	66%
CO5	Identify the appropriate instrument facilities for water quality analysis	66%

COURSE END SURVEY - CH233 - Chemical Technology and Environmental Engg Lab

Sl.No	Questions & Options
CO1	To what extend you can determine the various properties of oils such as acid value, iodine value and saponification value.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extend you are able to make soap and determine its important properties
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extend you are able to find out the sucrose content of sugar and available chlorine content of bleaching powder
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extend you can perform common environmental experiments to find the quality of water and wastewater samples.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extend you are able to identify the appropriate instrument facilities for water quality analysis
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CH233 - Chemical Technology and Environmental Engg Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1		2	2	1			2	2	1	1
CO2	1	1		2	2	1			2	2	1	1
CO3	1	1		2	2	1			2	2	1	1
CO4	1	1		2	2	1			2	2	1	1
CO5	1	1		2	2	1			2	2	1	1

CO->PSO MAPPING - CH233 - Chemical Technology and Environmental Engg Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	2	3	1
CO2	2	2	1
CO3	2	3	1
CO4	2	2	1
CO5	2	2	1

COURSE->PO MAPPING - CH233 - Chemical Technology and Environmental Engg Lab

CH233/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	1		2	2	1			2	2	1	1

COURSE->PSO MAPPING - CH233 - Chemical Technology and Environmental Engg Lab

CH233/PSO	PSO1	PSO2	PSO3
	2	3	1

HS210

Course Code	Course Name	L-T-P:C	Year of Introduction
HS210	Life Skills/Business Economics	2-0-2:3	2016

No.	Course Outcome - HS210 - Life Skills/Business Economics	Target
CO1	comprehend the techniques of language skills in Group Discussion, Presentations, Letter writing and Reports.	60%
CO2	Applies critical and creative thinking to solve problems	60%
CO3	Demonstrates ability to work in groups and teams	60%
CO4	demonstrates the qualities of a professional and is aware of work ethics	60%
CO5	applies the qualities of a leadership in all activities	60%

CO6	applies communication and leadership techniques in all formal environments	60%
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COURSE END SURVEY - HS210 - Life Skills/Business Economics

Sl.No	Questions & Options
CO1	To what extend can you communicate effectively in formal presentations and in teams
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	To what extend can you use creativity and critical thinking in solving problems
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	To what extend can you effectively work in teams and groups
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>
CO4	To what extend are you aware of work and professional ethics
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend do you exhibit the qualities of a leader
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	To what extend can you apply communication and leadership qualities in formal environments
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>

CO->PO MAPPING - HS210 - Life Skills/Business Economics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			2	1		2	1	3	3	3	3	2
CO2			2	1		2	1	3	3	3	3	2
CO3			2	1		2	1	3	3	3	3	2
CO4			2	1		2	1	3	3	3	3	2
CO5			2	1		2	1	3	3	3	3	2
CO6			2	1		2	1	3	3	3	3	2

CO->PSO MAPPING - HS210 - Life Skills/Business Economics

CO/PSO	PSO1	PSO2	PSO3
CO1		1	3
CO2		1	3
CO3		1	3
CO4		1	3
CO5		1	3

CO6		1	3
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COURSE->PO MAPPING - HS210 - Life Skills/Business Economics

HS210/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
			2	1		2	1	3	3	3	3	2

COURSE->PSO MAPPING - HS210 - Life Skills/Business Economics

HS210/PSO	PSO1	PSO2	PSO3
		1	3

MAT201

Course Code	Course Name	L-T-P:C	Year of Introduction
MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0:4	2019

No.	Course Outcome - MAT201 - PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	Target
CO1	Solve partial differential equations	60%
CO2	Analyse solutions of one dimensional wave and heat equations	60%
CO3	Understand the important concepts of a complex valued functions like continuity, differentiability and conformal mappings.	60%
CO4	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula	60%
CO5	Formulate the series expansion of complex function about a singularity and apply residue theorem to compute several kinds of real integrals.	60%

COURSE END SURVEY - MAT201 - PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS

Sl.No	Questions & Options
CO1	To what extent are you able to solve partial differential equations?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extent are you able to analyse solutions of one dimensional wave and heat equations
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent are you able to understand the important concepts of a complex valued functions like continuity, differentiability and conformal mappings.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extent are you able to evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO5	To what extent are you able to formulate the series expansion of complex function about a singularity and apply residue theorem to compute several kinds of real integrals.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - MAT201 - PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2									
CO2	3	3	2									
CO3	3	3	2									
CO4	3	3	2									
CO5	3	3	2									

CO->PSO MAPPING - MAT201 - PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	2		
CO3	2		
CO4	2		
CO5	2		

COURSE->PO MAPPING - MAT201 - PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS

MAT201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2									

COURSE->PSO MAPPING - MAT201 - PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS

MAT201/PSO	PSO1	PSO2	PSO3
	2		

CHT201

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT201	CHEMISTRY FOR PROCESS ENGINEERING	3-1-0:4	2019

No.	Course Outcome - CHT201 - CHEMISTRY FOR PROCESS ENGINEERING	Target
CO1	Describe the principles of analytical chemistry and their applications in chemical industry.	60.5%
CO2	Apply the principles of spectroscopy and microscopy to identify and characterize molecules, compounds and surface structures	60.5%

CO3	Illustrate distribution law and apply the knowledge in solvent extraction and describe the kinetics of different chemical processes.	60.5%
CO4	Analyze the basics of adsorption, surface analysis techniques and colloidal nature of particles to evaluate the desirable properties of adsorbents for chemical synthesis and industrial production.	60.5%
CO5	Evaluate the applications of nuclear and photochemistry techniques in medical diagnosis and industries	60.5%

COURSE END SURVEY - CHT201 - CHEMISTRY FOR PROCESS ENGINEERING

Sl.No	Questions & Options
CO1	To what extent you are able to describe the principles of analytical chemistry and their applications in chemical industry. Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to apply the principles of spectroscopy and microscopy to identify and characterize molecules, compounds and surface structures Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to illustrate distribution law and apply the knowledge in solvent extraction and describe the kinetics of different chemical processes. Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to analyze the basics of adsorption, surface analysis techniques and colloidal nature of particles to evaluate the desirable properties of adsorbents for chemical synthesis and industrial production. Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to evaluate the applications of nuclear and photochemistry techniques in medical diagnosis and industries Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CHT201 - CHEMISTRY FOR PROCESS ENGINEERING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3			2		2			
CO2	2	2	2	2				2				
CO3	2			2								
CO4	2	2	2	2								
CO5	3	2	3	2								

CO->PSO MAPPING - CHT201 - CHEMISTRY FOR PROCESS ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	2
CO2	2	2	

CO3	2		
CO4	2	2	
CO5	2	2	

COURSE->PO MAPPING - CHT201 - CHEMISTRY FOR PROCESS ENGINEERING

CHT201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3			2	2	2			

COURSE->PSO MAPPING - CHT201 - CHEMISTRY FOR PROCESS ENGINEERING

CHT201/PSO	PSO1	PSO2	PSO3
	3	3	2

CHT203

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT203	CHEMICAL PROCESS PRINCIPLES	3-1-0:4	2019

No.	Course Outcome - CHT203 - CHEMICAL PROCESS PRINCIPLES	Target
CO1	Convert physical quantities and empirical equations from one unit system to another	61%
CO2	Identify the composition of solid, liquid and gaseous mixtures in adequate unit systems	61%
CO3	Illustrate the properties of air- water vapor mixture from basic definitions and from Humidity chart	61%
CO4	Develop and assess material balance equations for various mass transfer operations	61%
CO5	Develop and assess material balance equations for various processes involving chemical reactions	61%
CO6	Develop and assess energy balance equations for unit operations and processes.	61%

COURSE END SURVEY - CHT203 - CHEMICAL PROCESS PRINCIPLES

Sl.No	Questions & Options
CO1	To what extend are you able to convert physical quantities and empirical equations from one unit system to another
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend are you able to identify the composition of solid, liquid and gaseous mixtures in adequate unit systems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend are you able to Illustrate the properties of air- water vapour mixture from basic definitions and from Humidity chart
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO4	To what extend are you able to develop and assess material balance equations for various mass transfer operations
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend are you able to develop and assess material balance equations for various processes involving chemical reactions
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend are you able to develop and assess energy balance equations for unit operations and processes.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CHT203 - CHEMICAL PROCESS PRINCIPLES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	2	2		1				1	1
CO2	3	3	1	2	2	1	1				1	1
CO3	3	3	1	2	2	1	1				1	1
CO4	1	2	1	3	3	1	1				1	1
CO5	1	3	1	3	3	2	2				1	1
CO6	1	3	2	3	3	2	2				1	1

CO->PSO MAPPING - CHT203 - CHEMICAL PROCESS PRINCIPLES

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - CHT203 - CHEMICAL PROCESS PRINCIPLES

CHT203/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	3	3	2	2				1	1

COURSE->PSO MAPPING - CHT203 - CHEMICAL PROCESS PRINCIPLES

CHT203/PSO	PSO1	PSO2	PSO3

EST200

Course Code	Course Name	L-T-P:C	Year of Introduction
EST200	Design & Engineering	2-0-0:2	2019

COURSE END SURVEY - EST200 - Design & Engineering**CO->PO MAPPING - EST200 - Design & Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - EST200 - Design & Engineering

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - EST200 - Design & Engineering

EST200/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - EST200 - Design & Engineering

EST200/PSO	PSO1	PSO2	PSO3

EST200

Course Code	Course Name	L-T-P:C	Year of Introduction
EST200	Design & Engineering	2-0-0:2	2019

No.	Course Outcome - EST200 - Design & Engineering	Target
CO1	Understand the steps involved in the design process.	67%
CO2	Apply design thinking while learning and practicing engineering.	67%
CO3	Understand the various design communication mechanisms.	67%
CO4	Understand fundamental design engineering concepts.	67%
CO5	Apply expediency, economics and sustainability in Design Engineering.	67%

COURSE END SURVEY - EST200 - Design & Engineering

Sl.No	Questions & Options
CO1	To what extend you are able to understand the various steps involved in the design? process
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	I am able to apply design thinking while practicing engineering.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO3	To what extend you are able to understand the various design communication mechanisms?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO4	I understood fundamental design engineering concepts.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO5	To what extend you are able to apply expediency, economics and sustainability in Design Engineering?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - EST200 - Design & Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

CO->PSO MAPPING - EST200 - Design & Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - EST200 - Design & Engineering

EST200/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - EST200 - Design & Engineering

EST200/PSO	PSO1	PSO2	PSO3

MCN201

Course Code	Course Name	L-T-P:C	Year of Introduction
MCN201	Sustainable Engineering	2-0-0:0	2019

COURSE END SURVEY - MCN201 - Sustainable Engineering**CO->PO MAPPING - MCN201 - Sustainable Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - MCN201 - Sustainable Engineering

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - MCN201 - Sustainable Engineering

MCN201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - MCN201 - Sustainable Engineering

MCN201/PSO	PSO1	PSO2	PSO3

MCN201

Course Code	Course Name	L-T-P:C	Year of Introduction
MCN201	Sustainable Engineering	2-0-0:0	2019

No.	Course Outcome - MCN201 - Sustainable Engineering	Target
CO1	Perceive the relevance and concept of sustainability and associated global initiatives	61%
CO2	Expound on the different types of environmental pollution problems and their sustainable solutions	61%
CO3	Be abreast of environmental regulations and standards	61%
CO4	Outline concepts of conventional and non-conventional energy	61%
CO5	Demonstrate sustainable practices using engineering knowledge	61%

COURSE END SURVEY - MCN201 - Sustainable Engineering

Sl.No	Questions & Options
CO1	The Sustainable Development Goals form a road map for the future..
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO2	Is global warming linked to climate change ?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	EIA is a necessary criteria during the course of greenfield projects.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO4	Is renewable energy penetrating the global energy market ?
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>
CO5	Are sustainable habitats a part of urban life ?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - MCN201 - Sustainable Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

CO->PSO MAPPING - MCN201 - Sustainable Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - MCN201 - Sustainable Engineering

MCN201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - MCN201 - Sustainable Engineering

MCN201/PSO	PSO1	PSO2	PSO3

CHL201

Course Code	Course Name	L-T-P:C	Year of Introduction
CHL201	CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB	0-0-3:2	2019

No.	Course Outcome - CHL201 - CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB	Target
CO1	Analyse and estimate parameters for the selected chemicals	70%
CO2	Develop skills to use analytical and instrumental methods for measurement of parameters relevant to chemical engineering.	70%
CO3	Develop Experiments and analytical skills to determine environmental qualitative parameters	70%
CO4	Demonstrate capacity to work in team and exhibit knowledge of safety, health and environment by practicing laboratory ethics	70%

CO5	Develop skills of accuracy in experimentation, interpret the experimental result and suggest its area of application	70%
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COURSE END SURVEY - CHL201 - CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB

Sl.No	Questions & Options
CO1	To what extent you were able to analyse and estimate the parameters for selected chemicals
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Are you able to use analytical and instrument method for measurement of parameters relevant to chemical engineering
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	Are you able to develop Experiments and analytical skills to determine environmental qualitative parameters
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to Demonstrate capacity to work in team and exhibit knowledge of safety, health and environment by practicing laboratory ethics
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	Are you able to interpret the experimental result and suggest its area of application
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CHL201 - CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1	2	3					1	2	
CO2			1		3					1	2	
CO3		1	2		3					1	2	
CO4						3	2		3	3	3	1
CO5	3			2	3	1	1		3	3	3	2

CO->PSO MAPPING - CHL201 - CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	
CO3	2	1	
CO4	1		3
CO5	3	1	

COURSE->PO MAPPING - CHL201 - CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB

CHL201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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	3	1	2	2	3	3	2		3	3	3	2
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COURSE->PSO MAPPING - CHL201 - CHEMICAL TECHNOLOGY & ENVIRONMENTAL ENGINEERING LAB

CHL201/PSO	PSO1	PSO2	PSO3
	3	1	3

CHL203

Course Code	Course Name	L-T-P:C	Year of Introduction
CHL203	Chemistry Lab for Process Engineering	0-0-3:2	2019

No.	Course Outcome - CHL203 - Chemistry Lab for Process Engineering	Target
CO1	Explain the thermodynamics of solutes in a solvent and apply this knowledge in higher semester practical sessions	55%
CO2	Describe the mutual solubilities of liquids and apply this idea in solvent extraction	55%
CO3	Construct a phase diagram off bi and tri component systems and predict the composition of mixtures at various temperature	55%
CO4	Investigate the adsorption isotherms and apply this knowledge in various industrial process	55%
CO5	Quantify the analyte using electrochemical and analytical techniques such as conductometry and potentiometry	55%

COURSE END SURVEY - CHL203 - Chemistry Lab for Process Engineering

Sl.No	Questions & Options
CO1	To what extend you were able to study the concepts of thermodynamics in solutes in solvent from the experiments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	will you be able to analyze the mutual solubility of liquids and apply it in unit operations
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO3	Will you be able to construct the phase diagrams of various mixtures at different tempertaures
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO4	How effectively can you plot the adsorption isotherms and apply its knowledge in various industires
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extend can you Quantify the analyte using electrochemical and analytical techniques such as conductometry and potentiometry
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>

CO->PO MAPPING - CHL203 - Chemistry Lab for Process Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		2		1	1		1	1	2	
CO2	2	2	1	1		1			1	1	2	
CO3	3	1	1	1		1			1	1	2	
CO4	3	1	2	2		1	1		1	1	2	
CO5	2	1	1	2			1		1	1	2	

CO->PSO MAPPING - CHL203 - Chemistry Lab for Process Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	1
CO2	2	1	1
CO3	3	1	1
CO4	3	1	1
CO5	2	1	1

COURSE->PO MAPPING - CHL203 - Chemistry Lab for Process Engineering

CHL203/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	2		1	1		1	1	2	

COURSE->PSO MAPPING - CHL203 - Chemistry Lab for Process Engineering

CHL203/PSO	PSO1	PSO2	PSO3
	3	1	1

VAC

Course Code	Course Name	L-T-P:C	Year of Introduction
VAC	Remedial/Minor/Honours course	3-1-0:4	2019

COURSE END SURVEY - VAC - Remedial/Minor/Honours course**CO->PO MAPPING - VAC - Remedial/Minor/Honours course**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - VAC - Remedial/Minor/Honours course

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - VAC - Remedial/Minor/Honours course

VAC/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - VAC - Remedial/Minor/Honours course

VAC/PSO	PSO1	PSO2	PSO3

CHT205

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT205	FLUID AND PARTICLE MECHANICS	3-1-0:4	2019

No.	Course Outcome - CHT205 - FLUID AND PARTICLE MECHANICS	Target
CO1	Apply the basic properties and transport laws to fluid in different conditions like statics and dynamics	66%
CO2	Apply the fluid flow principles in the application of the mass, momentum and energy equations	61%
CO3	Design a piping network using the concept of fluid dynamics	62%
CO4	Design a fluidized bed and a packed bed using the concept of fluid dynamics considering its application.	63%
CO5	Select valves, pumps and flow measuring devices in process industries with the knowledge of the basic principles.	66%

COURSE END SURVEY - CHT205 - FLUID AND PARTICLE MECHANICS

Sl.No	Questions & Options
CO1	Where you able to apply the basic properties and transport laws to fluid in different conditions like statics and dynamics?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Where you able to apply the fluid flow principles in the application of the mass, momentum and energy equations?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Where you able to design a piping network using the concept of fluid dynamics?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Where you able to design a fluidized bed and a packed bed using the concept of fluid dynamics considering its application?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Where you able to select valves, pumps and flow measuring devices in process industries with the knowledge of the basic principles?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CHT205 - FLUID AND PARTICLE MECHANICS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO1	3	1	1	1					2	1		2
CO2	3	3	3	3	3				2	1		2
CO3	3	3	3	2					1	1		2
CO4	3	3	3	2					2	1		2
CO5	3	2					2		2	2		2

CO->PSO MAPPING - CHT205 - FLUID AND PARTICLE MECHANICS

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - CHT205 - FLUID AND PARTICLE MECHANICS

CHT205/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3		2		2	2		2

COURSE->PSO MAPPING - CHT205 - FLUID AND PARTICLE MECHANICS

CHT205/PSO	PSO1	PSO2	PSO3

CHT281

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT281	Introduction to Chemical Engineering	3-1-0:4	2019

No.	Course Outcome - CHT281 - Introduction to Chemical Engineering	Target
CO1	Understand the role of chemical engineer in product and process development	61%
CO2	Understand dimensions, systems of units and carryout related conversions	61%
CO3	To differentiate between different unit operations and understand unit processes.	61%
CO4	To gain basic knowledge on selected topics in fluid flow and heat transfer	61%
CO5	To gain basic knowledge on selected topics in Chemical reaction Engineering, Process Control and instrumentation	61%
CO6	To gain understanding basic concepts Environmental safety in Chemical Process Industries	61%

COURSE END SURVEY - CHT281 - Introduction to Chemical Engineering

Sl.No	Questions & Options
CO1	How far was you able to understand the relevance of chemical engineering?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	How far was you able to identify the concept of concentration of solutions and conversions?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Were you able to identify and enlist different chemical processes and equipments?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	How far the basics of heat transfer and reaction engineering were understood?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	How far were you able to evaluate instrumentation requirements and control strategies related to chemical engineering
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	How far you can evaluate and asses the environmental aspects of Chemical Engineering.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CHT281 - Introduction to Chemical Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							2		1	1		
CO2	3	1		1								
CO3	1	1	2								1	
CO4	3	3	3	1	1						1	
CO5	3	3	3	1	1						1	
CO6						3	3	2	2	2	2	2

CO->PSO MAPPING - CHT281 - Introduction to Chemical Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			1
CO2	3	2	
CO3	2	1	
CO4	3	3	
CO5	3	3	
CO6	2		3

COURSE->PO MAPPING - CHT281 - Introduction to Chemical Engineering

CHT281/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	1	3	3	2	2	2	2	2

COURSE->PSO MAPPING - CHT281 - Introduction to Chemical Engineering

CHT281/PSO	PSO1	PSO2	PSO3
	3	3	3

SEMESTER-4**MA202**

Course Code	Course Name	L-T-P:C	Year of Introduction
MA202	Probability Distributions, Transforms and Numerical Methods	3-1-0:4	2016

No.	Course Outcome - MA202 - Probability Distributions, Transforms and Numerical Methods	Target
CO1	Apply the concept of random variables, probability distributions, specific discrete distributions in various Engineering problems.	62%
CO2	Utilize specific continuous distributions in various Engineering problems.	65%
CO3	Use Laplace transforms for engineering applications.	65%
CO4	Implement Fourier transforms for engineering applications.	65%
CO5	Solve various engineering problems using numerical methods for solution of equations and interpolation.	65%
CO6	Employ numerical methods for integration, differentiation and solution of differential equations	65%

COURSE END SURVEY - MA202 - Probability Distributions, Transforms and Numerical Methods

Sl.No	Questions & Options
CO1	To what extent are you able to apply the concept of random variables, probability distributions, specific discrete distributions in various Engineering problems ?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to utilize specific continuous distributions in various Engineering problems?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to use Laplace transforms for engineering applications?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to implement Fourier transforms for engineering applications.?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO5	To what extent are you able to solve various engineering problems using numerical methods for solution of equations and interpolation?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent are you able to employ numerical methods for integration, differentiation and solution of differential equations?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - MA202 - Probability Distributions, Transforms and Numerical Methods

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		1	1							
CO2	3	3	2	1	1							
CO3	3	3	1	1	1							
CO4	3	3	1	1	1							
CO5	3	3	1	1	1							
CO6	3	3	1	2	1							

CO->PSO MAPPING - MA202 - Probability Distributions, Transforms and Numerical Methods

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	
CO6	3	1	

COURSE->PO MAPPING - MA202 - Probability Distributions, Transforms and Numerical Methods

MA202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	1							

COURSE->PSO MAPPING - MA202 - Probability Distributions, Transforms and Numerical Methods

MA202/PSO	PSO1	PSO2	PSO3
	3	1	

CH202

Course Code	Course Name	L-T-P:C	Year of Introduction
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CH202	Process Heat Transfer	3-1-0:4	2016
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No.	Course Outcome - CH202 - Process Heat Transfer	Target
CO1	Identify and distinguish various modes of heat transfer, examine the mechanisms involved and the associated governing laws.	63%
CO2	Choose appropriate governing equations and analyze the different modes of heat transfer in different geometries and systems under steady and transient processes.	63%
CO3	Compare the different heat transfer processes based on the concept of analogy.	63%
CO4	Perform basic calculations to determine relevant design parameters for common heat exchangers.	63%
CO5	Interpret the concepts involved in heat transfer in extended surfaces and carry out basic design of single and multiple effect evaporators.	63%
CO6	Analyze the heat transfer associated with boiling and condensation.	63%

COURSE END SURVEY - CH202 - Process Heat Transfer

Sl.No	Questions & Options
CO1	How far you have been able to Identify and distinguish various modes of heat transfer and mechanisms involved and the associated governing laws
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How far you have been able to Choose appropriate governing equations for different modes of heat transfer in different geometries and systems under steady and transient processes.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How far you have been able to compare the different heat transfer processes based on the concept of analogy.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How far you have been able to perform basic calculations to determine relevant design parameters for common heat exchangers.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	How far you have been able to interpret the concepts involved in heat transfer in extended surfaces and carry out basic design of single and multiple effect evaporators.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	How far you have been able to analyze the heat transfer associated with boiling and condensation.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH202 - Process Heat Transfer

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1							
CO2	3	3	1	1	1							

CO3	2	2	1	2	1							1
CO4	3	3	3	1	2	1		1			1	
CO5	2	2	1	2	1						1	
CO6	2	2	1	2	1							

CO->PSO MAPPING - CH202 - Process Heat Transfer

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	
CO3	2	2	
CO4	2	2	
CO5	1	1	
CO6	1	1	

COURSE->PO MAPPING - CH202 - Process Heat Transfer

CH202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	2	1		1			1	1

COURSE->PSO MAPPING - CH202 - Process Heat Transfer

CH202/PSO	PSO1	PSO2	PSO3
	2	2	

CH204

Course Code	Course Name	L-T-P:C	Year of Introduction
CH204	Chemical Engineering Thermodynamics	3-1-0:4	2016

No.	Course Outcome - CH204 - Chemical Engineering Thermodynamics	Target
CO1	Apply the laws of thermodynamics to analyze Chemical Engineering problems	62%
CO2	Compute the properties of ideal/real gases and mixtures/solutions	62%
CO3	Analyze various processes involving mass, energy and entropy balances	62%
CO4	Evaluate the composition of vapor-liquid equilibria for ideal and non-ideal systems	62%
CO5	Determine equilibrium constant and mole fraction of reaction mixtures under a given condition	62%
CO6	Analyze the effect of various factors on reaction equilibria	62%

COURSE END SURVEY - CH204 - Chemical Engineering Thermodynamics

Sl.No	Questions & Options
CO1	To what extent can you apply the laws of thermodynamics to analyze Chemical Engineering problems
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent can you compute the properties of ideal/real gases and mixtures/solutions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent can you analyze various processes involving mass, energy and entropy balances
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent can you evaluate the composition of vapor-liquid equilibria for ideal and non-ideal systems
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent can you determine equilibrium constant and mole fraction of reaction mixtures under a given condition
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent can you analyze the effect of various factors on reaction equilibria
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH204 - Chemical Engineering Thermodynamics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2							1
CO2	3	3	2	2	1							1
CO3	3	3	2	2	3							1
CO4	2	2	2	2	1							
CO5	2	2	2	1	1							1
CO6	2	2	1	1	1							

CO->PSO MAPPING - CH204 - Chemical Engineering Thermodynamics

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	2	2	
CO3	3	3	
CO4	1	1	
CO5	2	1	
CO6	1	1	

COURSE->PO MAPPING - CH204 - Chemical Engineering Thermodynamics

CH204/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	3							1

COURSE->PSO MAPPING - CH204 - Chemical Engineering Thermodynamics

CH204/PSO	PSO1	PSO2	PSO3
	3	3	

CH206

Course Code	Course Name	L-T-P:C	Year of Introduction
CH206	Fluid and Particle Mechanics II	3-0-0:3	2016

No.	Course Outcome - CH206 - Fluid and Particle Mechanics II	Target
CO1	Illustrate the concept of drag force and fluid flow around a solid body	61%
CO2	Devise processes with large fluid-solid contact area utilizing fluidization phenomenon	61%
CO3	Compare different types of pumps, mixers and agitators used in industry	61%
CO4	Interpret processes involving compressible flow with the help of Mach number and associated relations	61%
CO5	Generalize flow behavior of non-Newtonian fluids	61%

COURSE END SURVEY - CH206 - Fluid and Particle Mechanics II

Sl.No	Questions & Options
CO1	What is the level of your understanding about the principle of drag in fluid flow.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Are you able to understand the concept of fluidization and its applications.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	What is your ability to identify a fluid transporting device for a specific application along with its capacity.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	What is the level of your knowledge in compressible fluid flow.
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	What is the level of your knowledge on NonNewtonian fluids.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH206 - Fluid and Particle Mechanics II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	2	2	2	1	2							
CO2	2	2	1	1	1							
CO3	1	1	2		1							
CO4	2	2	1	1								
CO5	1			1	1							

CO->PSO MAPPING - CH206 - Fluid and Particle Mechanics II

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	
CO3		1	
CO4	1	1	
CO5	1		

COURSE->PO MAPPING - CH206 - Fluid and Particle Mechanics II

CH206/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	2	1	2							

COURSE->PSO MAPPING - CH206 - Fluid and Particle Mechanics II

CH206/PSO	PSO1	PSO2	PSO3
	2	1	

CH208

Course Code	Course Name	L-T-P:C	Year of Introduction
CH208	Chemistry for Process Engineering II	3-0-0:3	2016

No.	Course Outcome - CH208 - Chemistry for Process Engineering II	Target
CO1	Describe the principles of analytical chemistry and their applications in chemical industry.	60%
CO2	Apply the principles of spectroscopy and microscopy to identify and characterize molecules, compounds and surface structures	60%
CO3	Interpret phase equilibria and electrochemical equilibria for different chemical engineering applications.	60%
CO4	Demonstrate the principles of electrochemistry and their applications in sensors and electrochemical devices	60%
CO5	Analyze the basics of adsorption, surface analysis techniques and colloidal nature of particles to evaluate the desirable properties of adsorbents for chemical synthesis and industrial production.	60%

CO6	Evaluate the applications of nuclear and radiochemistry techniques in medical diagnosis and industries	60%
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COURSE END SURVEY - CH208 - Chemistry for Process Engineering II

Sl.No	Questions & Options
CO1	To what extent you are able to describe the principles of analytical chemistry and their applications in chemical industry.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to apply the principles of spectroscopy and microscopy to identify and characterize molecules, compounds and surface structures
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to Interpret phase equilibria and electrochemical equilibria for different chemical engineering applications.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to demonstrate the principles of electrochemistry and their applications in sensors and electrochemical devices
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	To what extent you are able to analyze the basics of adsorption, surface analysis techniques and colloidal nature of particles to evaluate the desirable properties of adsorbents for chemical synthesis and industrial production.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	To what extent you are able to evaluate the applications of nuclear and radiochemistry techniques in medical diagnosis and industries
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - CH208 - Chemistry for Process Engineering II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		2	2				1			
CO2	2	1	1		2				1			
CO3	1	1	1		2							
CO4	2	2	1		1							
CO5	2	2	1	1								
CO6	1			1								

CO->PSO MAPPING - CH208 - Chemistry for Process Engineering II

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	

CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	
CO6	1	1	

COURSE->PO MAPPING - CH208 - Chemistry for Process Engineering II

CH208/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	1	2	2				1			

COURSE->PSO MAPPING - CH208 - Chemistry for Process Engineering II

CH208/PSO	PSO1	PSO2	PSO3
	2	1	

CH232

Course Code	Course Name	L-T-P:C	Year of Introduction
CH232	Fluid and Particle Mechanics Lab	0-0-3:1	2016

No.	Course Outcome - CH232 - Fluid and Particle Mechanics Lab	Target
CO1	Determine the discharge coefficients of flow meters.	68%
CO2	Analyze the characteristic curves of centrifugal pumps	68%
CO3	Determine the pressure drop through packed bed and fluidized bed	68%
CO4	Determine the point velocity of a fluid using Pitot tube	68%
CO5	Analyze Bernoulli's theorem and flow behavior of fluids	68%

COURSE END SURVEY - CH232 - Fluid and Particle Mechanics Lab

Sl.No	Questions & Options
CO1	What is your level of ability to determine the discharge coefficients of flow meters
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	Rate your ability to analyze the characteristic curves of centrifugal pumps
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO3	What is your level of knowledge in determining the pressure drop through packed and fluidized bed.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO4	What is your level of ability in point velocity determination using Pitot tube
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	Rate your ability to analyze Bernoulli's theorem and flow behavior of fluids
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>

CO->PO MAPPING - CH232 - Fluid and Particle Mechanics Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	2				2	1		1
CO2	2	2	1		2				2	1		1
CO3	3	2	3	1	2				2	1		1
CO4	2	1	1		2	1	1	1	2	1		1
CO5	3	3	2	1	2				2	1		1

CO->PSO MAPPING - CH232 - Fluid and Particle Mechanics Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	2		1
CO2	2	2	1
CO3	3	2	1
CO4	2	1	1
CO5	3	2	1

COURSE->PO MAPPING - CH232 - Fluid and Particle Mechanics Lab

CH232/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	2	1	1	1	2	1		1

COURSE->PSO MAPPING - CH232 - Fluid and Particle Mechanics Lab

CH232/PSO	PSO1	PSO2	PSO3
	3	2	1

CH234

Course Code	Course Name	L-T-P:C	Year of Introduction
CH234	Particle Technology Lab	0-0-3:1	2016

No.	Course Outcome - CH234 - Particle Technology Lab	Target
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CO1	Determine the particle size distribution, mean particle diameter, specific surface area and number of particles per unit mass using techniques such as sieve analysis, pipette analysis and beaker decantation	65%
CO2	Plan and perform experiments using size reduction equipment and estimate the energy requirements for a specified reduction in size of a given material	65%
CO3	Find out the area of a thickener by conducting batch sedimentation experiment	65%
CO4	Plan and perform experiments using equipment used in industrial operations such as rotary drum filter and leaf filter	65%
CO5	Learn the mechanism of solid separation from gas-solid mixture	65%

COURSE END SURVEY - CH234 - Particle Technology Lab

Sl.No	Questions & Options
CO1	To what extend you are able to perform size analysis using experiments such as sieve analysis, pipette analysis and beaker decantation
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extend you can able to perform experiments on size reduction
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extend you are able to perform a batch sedimentation experiment.
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extend you can Plan and perform experiments using equipment used in industrial operations such as rotary drum filter and leaf filter
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	How far can you able to understand operation of a cyclon separator
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - CH234 - Particle Technology Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2				2	1		1
CO2	2	2	2		2				2	1		1
CO3	2	2	2		2				2	1		1
CO4	2	2	2		2				2	1		1
CO5	3	2	2	1	2				2	1		1

CO->PSO MAPPING - CH234 - Particle Technology Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	1

CO2	2	1	1
CO3	2	1	1
CO4	2	1	1
CO5	3	2	1

COURSE->PO MAPPING - CH234 - Particle Technology Lab

CH234/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	1	2				2	1		1

COURSE->PSO MAPPING - CH234 - Particle Technology Lab

CH234/PSO	PSO1	PSO2	PSO3
	3	2	1

HS200

Course Code	Course Name	L-T-P:C	Year of Introduction
HS200	Life Skills/Business Economics	3-0-0:3	2016

No.	Course Outcome - HS200 - Life Skills/Business Economics	Target
CO1	Identify concepts in economics and interpret their role in managerial economics which will be useful in their profession and business.	66%
CO2	Analyze and interpret demand and supply of goods and services in the economy and its influence and execute production analysis.	62%
CO3	Recognize the effect of trade cycle in business and analyze various market situations.	61%
CO4	Measure National Income and evaluate measures taken by RBI in controlling inflation.	61%
CO5	Analyze, compare and justify investment decisions based on capital budgeting methods.	61%
CO6	Prepare and analyze balance sheets, interpret taxation system in India, compare different sources of capital for firms and carry out demand forecast.	61%

COURSE END SURVEY - HS200 - Life Skills/Business Economics

Sl.No	Questions & Options
CO1	To what extent you are able to identify concepts in Economics & interpret their role in Managerial Economics Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	To what extent you are able to analyse & interpret determinants of demand & supply & the factors which leads to changes in demand & supply of goods & services in the economy. Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>

CO3	To what extent you are able to recognise the effect of trade cycle in business
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to evaluate the effect of the measures taken by RBI in controlling inflation
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	To what extent you are able to compare & justify investment decisions based on capital budgeting methods
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO6	To what extent you are able to prepare balance sheet,interpret GST& compare the different sources of finance for firms
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>

CO->PO MAPPING - HS200 - Life Skills/Business Economics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				1	1		1	2	1	1	3	2
CO2				1	1		1	2	1	1	3	2
CO3				1	1		1	2	1	1	3	2
CO4				1	1		1	2	1	1	3	2
CO5				1	1		1	2	1	1	3	2
CO6				1	1		1	2	1	1	3	2

CO->PSO MAPPING - HS200 - Life Skills/Business Economics

CO/PSO	PSO1	PSO2	PSO3
CO1		1	3
CO2		1	3
CO3		1	3
CO4		1	3
CO5		1	3
CO6		1	3

COURSE->PO MAPPING - HS200 - Life Skills/Business Economics

HS200/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
				1	1		1	2	1	1	3	2

COURSE->PSO MAPPING - HS200 - Life Skills/Business Economics

HS200/PSO	PSO1	PSO2	PSO3
		1	3

CHT202

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT202	Chemical Engineering Thermodynamics	3-1-0:4	2019

No.	Course Outcome - CHT202 - Chemical Engineering Thermodynamics	Target
CO1	Apply the laws of thermodynamics to analyse various processes	66%
CO2	Define thermodynamic properties and processes of a system	66%
CO3	Relate various thermodynamic properties to easily measurable properties	66%
CO4	Calculate the change in properties when given substances are mixed under specified conditions	66%
CO5	Construct phase diagrams and Explain VLE of completely miscible, partially miscible and immiscible liquids	66%
CO6	Evaluate equilibrium constant, composition and degrees of freedom for reactions taking place in a given mixture of components at given conditions of temperature and pressure	66%

COURSE END SURVEY - CHT202 - Chemical Engineering Thermodynamics

Sl.No	Questions & Options
CO1	To what extent are you able to apply the laws of thermodynamics to analyse various processes
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent can you define thermodynamic properties and processes of a system
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent can you relate thermodynamic properties to easily measurable properties
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO4	To what extent can you Calculate the change in properties when given substances are mixed under specified conditions
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	to what extent are you able to Construct phase diagrams and Explain VLE of completely miscible, partially miscible and immiscible liquids
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	to what extent can you Evaluate equilibrium constant, composition and degrees of freedom for reactions taking place in a given mixture of components at given conditions of temperature and pressure
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>

CO->PO MAPPING - CHT202 - Chemical Engineering Thermodynamics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	1	3	1	2	1	1						
CO2	3	1		1	1							
CO3	1	1		1	1							
CO4	1	1		1	1							
CO5	1	2		1								
CO6	2	3	1	2								

CO->PSO MAPPING - CHT202 - Chemical Engineering Thermodynamics

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - CHT202 - Chemical Engineering Thermodynamics

CHT202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	1	2	1	1						

COURSE->PSO MAPPING - CHT202 - Chemical Engineering Thermodynamics

CHT202/PSO	PSO1	PSO2	PSO3

CHT204

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT204	HEAT TRANSFER OPERATIONS	3-1-0:4	2019

No.	Course Outcome - CHT204 - HEAT TRANSFER OPERATIONS	Target
CO1	Identify and distinguish various modes of heat transfer and examine the mechanisms	65%
CO2	Apply appropriate governing equations and analyse conduction heat transfer problems for different geometries under steady state and transient processes	60%
CO3	Solve forced and natural convection heat transfer problems using empirical equations.	60%
CO4	Explain the concepts behind radiation heat transfer and solve radiation heat transfer problems	60%

CO5	Analyse the heat transfer processes involved in boiling and condensation	60%
CO6	Design of heat exchangers and evaporators after interpreting the basic concepts	60%

COURSE END SURVEY - CHT204 - HEAT TRANSFER OPERATIONS

Sl.No	Questions & Options
CO1	Where you able to identify and distinguish various modes of heat transfer?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Where you able to apply the different governing equations and analyse conduction heat transfer for different geometries under steady and unsteady processes??
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Where you able to solve convection heat transfer problems?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Where you able to understand concepts of radiation and solve related problems?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Where you able to understand boiling and condensation heat transfer processes?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	Whether apply the basic concepts of heat transfer to design heat exchangers and evaporators?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CHT204 - HEAT TRANSFER OPERATIONS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2	3	3		2								
CO3	3	3		2								
CO4	3	3		2								
CO5	3	3										
CO6	3	3	3		2							

CO->PSO MAPPING - CHT204 - HEAT TRANSFER OPERATIONS

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			

CO5			
CO6			

COURSE->PO MAPPING - CHT204 - HEAT TRANSFER OPERATIONS

CHT204/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	2							

COURSE->PSO MAPPING - CHT204 - HEAT TRANSFER OPERATIONS

CHT204/PSO	PSO1	PSO2	PSO3

CHT206

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT206	Particle Technology	3-1-0:4	2019

No.	Course Outcome - CHT206 - Particle Technology	Target
CO1	Evaluate the particle size distribution, mean particle diameter, specific surface area and number of particles per unit mass using techniques such as sieve analysis, pipette analysis and beaker decantation	68%
CO2	Identify the principles of free settling, hindered settling and mineral beneficiation techniques	68%
CO3	Apply the concepts of filtration theory and select appropriate filtration equipment	68%
CO4	Describe separation techniques for particulates in ai	68%
CO5	Select suitable size reduction equipment and estimate the energy requirements for a specified reduction in size for a given material.	68%
CO6	Demonstrate mixing and conveying processes in chemical industries	68%

COURSE END SURVEY - CHT206 - Particle Technology

Sl.No	Questions & Options
CO1	Where you able to Evaluate the particle size distribution, mean particle diameter, specific surface area and number of particles per unit mass using techniques such as sieve analysis, pipette analysis and beaker decantation
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Where you able to Identify the principles of free settling, hindered settling and mineral beneficiation techniques
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	where you able to Apply the concepts of filtration theory and select appropriate filtration equipment
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO4	Where you able to Describe separation techniques for particulates in air
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Where you able to Select suitable size reduction equipment and estimate the energy requirements for a specified reduction in size for a given material.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	where you able to Demonstrate mixing and conveying processes in chemical industries
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CHT206 - Particle Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2			3									
CO3	3											
CO4	3											
CO5			3									
CO6	3											

CO->PSO MAPPING - CHT206 - Particle Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	3		
CO2		3	
CO3	3		
CO4	3		
CO5		3	
CO6		3	

COURSE->PO MAPPING - CHT206 - Particle Technology

CHT206/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3		3									

COURSE->PSO MAPPING - CHT206 - Particle Technology

CHT206/PSO	PSO1	PSO2	PSO3
	3	3	

HUT200

Course Code	Course Name	L-T-P:C	Year of Introduction
HUT200	PROFESSIONAL ETHICS	2-0-0:2	2019

No.	Course Outcome - HUT200 - PROFESSIONAL ETHICS	Target
CO1	Understand and recall the core values that shape the ethical behavior of a professional (Knowledge and Comprehension).	0%
CO2	Adopt a good character and follow an ethical life.(Synthesize)	0%
CO3	Explain and point out the role and responsibility in technological development by keeping personal ethics and legal ethic(ANALYSING)	0%
CO4	Solve moral and ethical problems through exploration and assessment by established experiments(APPLYING)	0%
CO5	Apply and appraise the knowledge of human values and social values to contemporary ethical values and global issues.(EVALUATING)	0%

COURSE END SURVEY - HUT200 - PROFESSIONAL ETHICS

Sl.No	Questions & Options
CO1	I am able to understand and recall core values required in professional life.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	I am able to adopt a good character and follow an ethical life.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	I am able to understand the roles and responsibilities of a professional.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO4	I am able to analyze and solve moral and ethical problems.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	I am able to judge a case or global issue.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - HUT200 - PROFESSIONAL ETHICS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1	2									
CO2	1		2									
CO3	1			1								
CO4						1						
CO5						2						

CO->PSO MAPPING - HUT200 - PROFESSIONAL ETHICS

CO/PSO	PSO1	PSO2	PSO3
CO1	1		
CO2	2		
CO3	1		
CO4	1		
CO5	1		

COURSE->PO MAPPING - HUT200 - PROFESSIONAL ETHICS

HUT200/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	1	2	1		2						

COURSE->PSO MAPPING - HUT200 - PROFESSIONAL ETHICS

HUT200/PSO	PSO1	PSO2	PSO3
	2		

CHL202

Course Code	Course Name	L-T-P:C	Year of Introduction
CHL202	Fluid and Particle Mechanics Lab	0-0-3:2	2019

No.	Course Outcome - CHL202 - Fluid and Particle Mechanics Lab	Target
CO1	Plan and perform experiments in flow measuring equipments and analyse the principles involved	65%
CO2	Plan and perform experiments in fluid moving machinery and analyse the principles involved	65%
CO3	Plan and perform experiments in solid-fluid systems and analyse the principles involved.	65%
CO4	Demonstrate capacity to work in teams and exhibit knowledge of safety, health and environment by practicing laboratory ethics.	65%

COURSE END SURVEY - CHL202 - Fluid and Particle Mechanics Lab

Sl.No	Questions & Options
CO1	Were you able to perform experiments in flow measuring equipments and analyse the principles involved
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Were you able to perform experiments in fluid moving machinery and analyse the principles involved
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Were you able to perform experiments in solid-fluid systems and analyse the principles involved.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO4	Were you able to demonstrate capacity to work in teams and exhibit knowledge of safety, health and environment by practicing laboratory ethics.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CHL202 - Fluid and Particle Mechanics Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												

CO->PSO MAPPING - CHL202 - Fluid and Particle Mechanics Lab

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			

COURSE->PO MAPPING - CHL202 - Fluid and Particle Mechanics Lab

CHL202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CHL202 - Fluid and Particle Mechanics Lab

CHL202/PSO	PSO1	PSO2	PSO3

CHL204

Course Code	Course Name	L-T-P:C	Year of Introduction
CHL204	Particle Technology Lab	0-0-3:2	2019

No.	Course Outcome - CHL204 - Particle Technology Lab	Target
CO1	Use the basic principles of Particle technology to find solutions of problems by conducting experiments in the laboratory.	66%
CO2	Design experiments and analyze/interpret data collected from experimental investigation in the laboratory	66%
CO3	Use modern computing tools necessary for analysis of the experimental data in the laboratory.	66%
CO4	Exhibit ethical principles in engineering profession by practicing ethical approaches in experimental investigation, collection and reporting of data and adhering to the safety ethics set by the laboratory	66%

CO5	Practice work in diverse groups and perform laboratory experiments	66%
CO6	Prepare cogent reports of the experimental works conducted in laboratory	66%

COURSE END SURVEY - CHL204 - Particle Technology Lab

Sl.No	Questions & Options
CO1	Did you understand and differentiate the basic principles of particle technology?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	How far were you able to design experiments and analyze/interpret data collected from experimental investigation ?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	How far were you able analyse the experimental data?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How far were you able to incorporate ethical approaches in experimental investigation?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Were you able work in groups effectively?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	How far were you able to prepare cogent reports?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CHL204 - Particle Technology Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2		3		3								
CO3					3							
CO4						3		3				
CO5				2					3			
CO6				2						3		

CO->PSO MAPPING - CHL204 - Particle Technology Lab

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			

CO5			
CO6			

COURSE->PO MAPPING - CHL204 - Particle Technology Lab

CHL204/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3		3	3	3		3	3	3		

COURSE->PSO MAPPING - CHL204 - Particle Technology Lab

CHL204/PSO	PSO1	PSO2	PSO3

MAT202

Course Code	Course Name	L-T-P:C	Year of Introduction
MAT202	Probability, Statistics and Numerical Methods	3-1-0:4	2019

No.	Course Outcome - MAT202 - Probability, Statistics and Numerical Methods	Target
CO1	Understand the concept, properties and important models of discrete random variables and, using them analyse suitable random phenomena	55%
CO2	Understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena.	55%
CO3	Perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population	57%
CO4	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques	60%
CO5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.	60%

COURSE END SURVEY - MAT202 - Probability, Statistics and Numerical Methods

Sl.No	Questions & Options
CO1	How far this course has helped you to understand the concept, properties and important models of discrete random variables and, using them analyse suitable random phenomena
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	How far this course has helped you to understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	How far this course has helped you to perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO4	How far this course has helped you to compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	How far this course has helped you to apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - MAT202 - Probability, Statistics and Numerical Methods

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3										1
CO2	3	3										1
CO3	3	3		3								1
CO4	3	3										1
CO5	3	3										1

CO->PSO MAPPING - MAT202 - Probability, Statistics and Numerical Methods

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	2		
CO3	2		
CO4	2		
CO5	2		

COURSE->PO MAPPING - MAT202 - Probability, Statistics and Numerical Methods

MAT202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3		3								1

COURSE->PSO MAPPING - MAT202 - Probability, Statistics and Numerical Methods

MAT202/PSO	PSO1	PSO2	PSO3
	2		

MCN202

Course Code	Course Name	L-T-P:C	Year of Introduction
MCN202	CONSTITUTION OF INDIA	2-0-0:0	2019

No.	Course Outcome - MCN202 - CONSTITUTION OF INDIA	Target
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CO1	Awareness of Constitution of India	60%
CO2	Knowing duties and rights of Citizens	60%
CO3	Understanding the working of union executive, parliament..	60%
CO4	Understanding the working of judiciary, legislature, state executive	60%
CO5	Utilize special provision and statutory institutions	60%
CO6	Patriotism and being responsible citizens.	60%

COURSE END SURVEY - MCN202 - CONSTITUTION OF INDIA

Sl.No	Questions & Options
CO1	Did you have the awareness of constitution of India
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO2	Are you able to know about the duties and rights of Citizens
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	Did you able to understand the working of union executive, parliament..
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	Do you understand the working of judiciary, legislature, state executive
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO5	Are you aware about the special provision and statutory institutions
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO6	Did you get clear idea about the responsibilities of a citizens and importance patriotism
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO->PO MAPPING - MCN202 - CONSTITUTION OF INDIA

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												

CO->PSO MAPPING - MCN202 - CONSTITUTION OF INDIA

CO/PSO	PSO1	PSO2	PSO3
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CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - MCN202 - CONSTITUTION OF INDIA

MCN202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - MCN202 - CONSTITUTION OF INDIA

MCN202/PSO	PSO1	PSO2	PSO3

SEMESTER-5**CH305**

Course Code	Course Name	L-T-P:C	Year of Introduction
CH305	Chemical Reaction Engineering I	3-0-0:3	2016

No.	Course Outcome - CH305 - Chemical Reaction Engineering I	Target
CO1	Analyze the principles of chemical kinetics and thermodynamics of different chemical reactions.	66.5%
CO2	Analyze the mechanism of chemical reactions.	66.5%
CO3	Determine the chemical kinetic parameters using various experimental methods.	66.5%
CO4	Design of ideal reactors for single and complex reactions.	66.5%
CO5	Develop skills to choose the right reactor for multiple reactions.	66.5%
CO6	Determine rate laws for enzymatic reactions and design bioreactors.	66.5%

COURSE END SURVEY - CH305 - Chemical Reaction Engineering I

Sl.No	Questions & Options
CO1	What is your level of knowledge in analysing the kinetics of the chemical reactions.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	What is your level of knowledge in analyzing the mechanism of chemical reactions.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO3	What is your level of knowledge in the determination of chemical kinetic parameters using experimental methods.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to do the design of ideal reactors for single and complex reactions.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to choose the right reactor for multiple reactions.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	What is your level of knowledge in rate law determination of enzymatic reactions and bioreactor design.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH305 - Chemical Reaction Engineering I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	1							
CO2	2	2										
CO3	2	1	1									
CO4	2	2	2		1							
CO5	2	1	1		1							
CO6	2	1										

CO->PSO MAPPING - CH305 - Chemical Reaction Engineering I

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	2	1	
CO3	2	1	
CO4	2	2	
CO5	1	1	
CO6	1	1	

COURSE->PO MAPPING - CH305 - Chemical Reaction Engineering I

CH305/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	1	1							

COURSE->PSO MAPPING - CH305 - Chemical Reaction Engineering I

CH305/PSO	PSO1	PSO2	PSO3
	3	2	

CH301

Course Code	Course Name	L-T-P:C	Year of Introduction
CH301	Environmental Engineering	3-1-0:4	2016

No.	Course Outcome - CH301 - Environmental Engineering	Target
CO1	Recognize the environmental legislation and regulation aimed at protecting the environment from harmful actions.	62%
CO2	Know the different types of treatment processes for drinking water, municipal water and boiler feed water	62%
CO3	Know the primary, secondary & tertiary treatment methods used for the waste water treatment.	62%
CO4	Design waste water treatment equipment such as activated sludge process and trickling filters.	62%
CO5	Predict suitable treatment and disposal methods for industrial and hazardous wastes	62%
CO6	Identify air and noise pollution sources and select control methods	62%

COURSE END SURVEY - CH301 - Environmental Engineering

Sl.No	Questions & Options
CO1	To what extend you are able to recognise the environmental legislation and regulation aimed at protecting the environment from harmful actions.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend you are able to know the different types of treatment processes for drinking water, municipal water and boiler feed water
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend you are able to know the primary, secondary & tertiary treatment methods used for the waste water treatment
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend you are able to design waste water treatment equipment such as activated sludge process and trickling filters.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend you are able to predict suitable treatment and disposal methods for industrial and hazardous wastes
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend you are able to identify air and noise pollution sources and select control methods
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH301 - Environmental Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3	3	1		1		
CO2	2	1	1			1	1			1		
CO3	2	1	1			1	1			1		
CO4	2	2	3	1	1							
CO5	1	1				1	1					
CO6	1	1				1	1			1		

CO->PSO MAPPING - CH301 - Environmental Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1			1
CO2	2	1	
CO3	2	1	
CO4	2	2	
CO5	1		
CO6	1		

COURSE->PO MAPPING - CH301 - Environmental Engineering

CH301/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	3	1	1	3	3	1		1		

COURSE->PSO MAPPING - CH301 - Environmental Engineering

CH301/PSO	PSO1	PSO2	PSO3
	2	2	1

CH303

Course Code	Course Name	L-T-P:C	Year of Introduction
CH303	Mass Transfer Operations I	3-0-0:3	2016

No.	Course Outcome - CH303 - Mass Transfer Operations I	Target
CO1	Explain the phenomena of molecular diffusion and interphase mass transfer	60%
CO2	Explain the operation of gas-liquid contacting equipments	63%
CO3	Design absorption equipments	60%

CO4	Explain the process of adsorption, humidification and dehumidification	60%
CO5	Design drying equipments	60%
CO6	Explain the process of crystallization	60%

COURSE END SURVEY - CH303 - Mass Transfer Operations I

Sl.No	Questions & Options
CO1	To what extent are you able to explain the phenomena of molecular diffusion and interphase mass transfer
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to explain the operation of gas-liquid contacting equipments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to design absorption equipments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to explain the process of adsorption, humidification and dehumidification
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to design drying equipments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent are you able to explain the process of crystallization
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH303 - Mass Transfer Operations I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										
CO2	3	2										
CO3	2	2	1	1								
CO4	3	2										
CO5	2	2	3	1								
CO6	1											

CO->PSO MAPPING - CH303 - Mass Transfer Operations I

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	2		
CO3		1	

CO4	2		
CO5	3	1	
CO6	1		

COURSE->PO MAPPING - CH303 - Mass Transfer Operations I

CH303/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	1								

COURSE->PSO MAPPING - CH303 - Mass Transfer Operations I

CH303/PSO	PSO1	PSO2	PSO3
	3	1	

CH307

Course Code	Course Name	L-T-P:C	Year of Introduction
CH307	Computer Programming in C++	2-1-0:3	2016

No.	Course Outcome - CH307 - Computer Programming in C++	Target
CO1	Demonstrate the differences between traditional structured programming and Object-Oriented programming, describe datatypes and operators in object oriented programming.	60%
CO2	Describe and discuss various decision making and looping statements in object oriented programming	60%
CO3	Apply knowledge of computing and mathematics using derived datatypes such as functions and arrays and user defined datatype such as class	60%
CO4	Discuss operator and function overloading and apply the knowledge of overloading and inheritance in C++.	60%
CO5	Develop skill to use pointers, memory allocation and data handling through files in C++.	60%

COURSE END SURVEY - CH307 - Computer Programming in C++

Sl.No	Questions & Options
CO1	To what extent you are able to describe datatypes and operators in object oriented programming?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to describe and discuss various decision making and looping statements in object oriented programming?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to apply knowledge of computing and mathematics using derived datatypes such as functions and arrays and user defined datatype such as class?

	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to discuss operator and function overloading and apply the knowledge of overloading and inheritance in C++?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you have developed skill to use pointers, memory allocation and data handling through files in C++?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH307 - Computer Programming in C++

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1		3				1			
CO2	2	1	1		3				1		2	
CO3	3	2	2	1	3				1			
CO4	3	2	2	1	3				1			
CO5	2	1	1	1	3				1			

CO->PSO MAPPING - CH307 - Computer Programming in C++

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	1		2
CO3	2	2	
CO4	3	2	
CO5	3	1	

COURSE->PO MAPPING - CH307 - Computer Programming in C++

CH307/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	1	3				1		2	

COURSE->PSO MAPPING - CH307 - Computer Programming in C++

CH307/PSO	PSO1	PSO2	PSO3
	3	2	2

CH363

Course Code	Course Name	L-T-P:C	Year of Introduction
CH363	Principles of Nano Materials and Nano Technology	3-0-0:3	2016

No.	Course Outcome - CH363 - Principles of Nano Materials and Nano Technology	Target
CO1	To understand the fundamental principles of nanomaterials and their classification	61%
CO2	To gain knowledge on the instrumental techniques for characterization of nanoparticles	61%
CO3	To gain understanding of synthesizing various types of nanostructures	61%
CO4	To understand carbon nanomaterials, nanocomposites and their properties	61%
CO5	To gain knowledge on manufacture of nanoscale materials	61%
CO6	To understand the application of nanotechnology and their use in emerging areas	61%

COURSE END SURVEY - CH363 - Principles of Nano Materials and Nano Technology

Sl.No	Questions & Options
CO1	To what extend are you able to understand the fundamental principles of nanomaterials and their classification
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend are you able to gain knowledge on the instrumental techniques for characterization of nanoparticles
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend are you able to familiarize with the synthesis of various types of nanostructures
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend are you able to understand the special category of nanomaterials and their properties
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend are you able to identify laboratory based materials for the manufacture of nanoscale materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend are you able to understand the application of nanotechnology and their emerging areas
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH363 - Principles of Nano Materials and Nano Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1										
CO2			1	3	3							
CO3		1		2								
CO4	1	1		3								
CO5	1	1		3	2							

CO6			1				1					
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CO->PSO MAPPING - CH363 - Principles of Nano Materials and Nano Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	3		
CO2		1	
CO3		1	
CO4		1	
CO5		1	
CO6		1	

COURSE->PO MAPPING - CH363 - Principles of Nano Materials and Nano Technology

CH363/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	1	3	3		1					

COURSE->PSO MAPPING - CH363 - Principles of Nano Materials and Nano Technology

CH363/PSO	PSO1	PSO2	PSO3
	3	1	

CH333

Course Code	Course Name	L-T-P:C	Year of Introduction
CH333	CHEMICAL REACTION ENGINEERING LAB	0-0-3:1	2016

No.	Course Outcome - CH333 - CHEMICAL REACTION ENGINEERING LAB	Target
CO1	Determine kinetic parameters of chemical reactions.	67%
CO2	Determine kinetic parameters of chemical reactions in a batch reactor.	67%
CO3	Analyze the residence time distribution in flow reactors.	67%
CO4	Determine kinetic parameters of chemical reactions in continuous reactor systems.	67%
CO5	Analyze the performance of semi batch reactors.	67%
CO6	Analyze the performance of combined reactors.	67%

COURSE END SURVEY - CH333 - CHEMICAL REACTION ENGINEERING LAB

Sl.No	Questions & Options
CO1	To what extend you are able to determine kinetic parameters of chemical reactions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO2	To what extend you are able to kinetic parameters of chemical reactions in batch reactor
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extend you are able to analyze the residence time distribution in flow reactors
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extend you are able to determine kinetic parameters of the chemical reactions in continuous reactor systems.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extend you are able to analyze the performance of semi batch reactors
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extend you are able to analyze the performance of combined reactors.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH333 - CHEMICAL REACTION ENGINEERING LAB

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1					2	1		1
CO2	3	3	3	1	1				2	1		1
CO3	2	1	1	1	1				2	1		1
CO4	3	3	3	1	1				2	1		1
CO5	3	3	3	1	1				2	1		1
CO6	3	3	3	1	1				2	1		1

CO->PSO MAPPING - CH333 - CHEMICAL REACTION ENGINEERING LAB

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	2	2	1
CO3	2	1	1
CO4	2	2	1
CO5	2	2	1
CO6	2	2	1

COURSE->PO MAPPING - CH333 - CHEMICAL REACTION ENGINEERING LAB

CH333/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	1				2	1		1

COURSE->PSO MAPPING - CH333 - CHEMICAL REACTION ENGINEERING LAB

CH333/PSO	PSO1	PSO2	PSO3
	3	2	1

CH331

Course Code	Course Name	L-T-P:C	Year of Introduction
CH331	Heat Transfer Operations Lab	0-0-3:1	2016

No.	Course Outcome - CH331 - Heat Transfer Operations Lab	Target
CO1	Analyse heat transfer due to conduction through composite material and liquids	67%
CO2	Evaluate heat transfer coefficient in natural and forced convection heat transfer	67%
CO3	Estimate Stefan Boltzmann constant and emissivity in radiative heat transfer	67%
CO4	Analyze condensation phenomenon	67%
CO5	Analyze transient heat conduction	67%
CO6	Analyze effectiveness of heat pipe in conducting heat	67%

COURSE END SURVEY - CH331 - Heat Transfer Operations Lab

Sl.No	Questions & Options
CO1	To what extent you are able to analyse heat transfer due to conduction through composite material and liquids
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to evaluate heat transfer coefficient in natural and forced convection heat transfer
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to estimate Stefan Boltzmann constant and emissivity in radiative heat transfer
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you are able to analyze boiling and condensation phenomenon
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you are able to analyze transient heat conduction
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you are able to analyze heat exchanger performance
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH331 - Heat Transfer Operations Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1				2	1		1
CO2	3	3	2	1	2					1		1
CO3	3	2	2	1	1				2	1		1
CO4	3	3	2	1	2				2	1		1
CO5	3	3	2	1	2				2	1		1
CO6	3	3	2	1	2				1	1		1

CO->PSO MAPPING - CH331 - Heat Transfer Operations Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	3	2	1
CO3	2	1	1
CO4	2	1	1
CO5	2	1	1
CO6	2	1	1

COURSE->PO MAPPING - CH331 - Heat Transfer Operations Lab

CH331/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	2				2	1		1

COURSE->PSO MAPPING - CH331 - Heat Transfer Operations Lab

CH331/PSO	PSO1	PSO2	PSO3
	3	2	1

CH341

Course Code	Course Name	L-T-P:C	Year of Introduction
CH341	Design Project	0-1-2:2	2016

No.	Course Outcome - CH341 - Design Project	Target
CO1	Identify engineering aspects in the design of products, processes, or techniques in the area of chemical engineering.	66%
CO2	Relate theoretical principles with product or process designs.	62%
CO3	Develop innovative design solutions for engineering problems, as a team.	66%

CO4	Evaluate different solutions based on their engineering principle and suitability.	66%
CO5	Formulate appropriate engineering design for an identified solution through team work.	66%
CO6	Justify the developed design through oral and written communication.	66%

COURSE END SURVEY - CH341 - Design Project

Sl.No	Questions & Options
CO1	To what extent are you able to identify engineering aspect in the design of any product or process in chemical engineering?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	How far you be able to relate theoretical principles with the design process?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO3	How far you be able to develop innovative design solutions for an engineering problem?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO4	To what extend would you be able to critically evaluate different solutions to an engineering problem?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO5	How confident are you in working in a team for developing engineering design of a product or process?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO6	How far you are be able to justify an engineering design that you develop, both orally and in writing?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>

CO->PO MAPPING - CH341 - Design Project

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2			1	1	1	3	3	2	1
CO2	3	3	3	1	2				2	2	2	1
CO3	3	2	3	1	2			1	3	3	2	1
CO4	2	2	1		2				2	2	2	1
CO5	2	2	3	1	2			2	3	3	2	1
CO6					1	1				3	2	2

CO->PSO MAPPING - CH341 - Design Project

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	2
CO2	3	1	2
CO3	3	1	3

CO4	3	1	2
CO5	3	1	2
CO6	1	1	2

COURSE->PO MAPPING - CH341 - Design Project

CH341/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	2	1	1	2	3	3	2	2

COURSE->PSO MAPPING - CH341 - Design Project

CH341/PSO	PSO1	PSO2	PSO3
	3	1	3

HS300

Course Code	Course Name	L-T-P:C	Year of Introduction
HS300	Principles of Management	3-0-0:3	2016

No.	Course Outcome - HS300 - Principles of Management	Target
CO1	Manage people, organisation and environment for achieving competitive advantage	65%
CO2	Critically analyse, evaluate and manipulate management theories and practices	65%
CO3	Prepare an organizational plan and execute planning process based on the goals and objectives	65%
CO4	Design organizational structure and establish the relationship among departments.	65%
CO5	Demonstrate staffing and related human resource development functions to manage and appraise employees.	65%
CO6	To understand the practical implications of studying management with regards to the corporate world. Lead employees, subordinates and propose control activities in organizations	65%

COURSE END SURVEY - HS300 - Principles of Management

Sl.No	Questions & Options
CO1	To what extent does the course help to manage people, organisation and environment for achieving competitive advantage?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	Is the course helpful to critically analyse, evaluate and manipulate management theories and practices
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO3	Does the course help to prepare an organizational plan and execute planning process based on the goals and objectives?

	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO4	Does the course aid in designing organizational structure and establish the relationship among departments.
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>
CO5	To what level did the course demonstrate staffing and related human resource development functions to manage and appraise employees?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO6	Did the course help to understand the practical implications of studying management with regards to the corporate world. Lead employees, subordinates and propose control activities in organizations?
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO->PO MAPPING - HS300 - Principles of Management

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1					2	2	1	2	2	1	1
CO2	1		1			2		1	2	1	2	1
CO3			1			1		1	1	1	1	1
CO4			1			1		1	1	1	2	1
CO5						1		2	2	2	2	1
CO6						3	2	2	1	2	1	1

CO->PSO MAPPING - HS300 - Principles of Management

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	3
CO2		1	1
CO3		1	3
CO4			2
CO5			2
CO6			3

COURSE->PO MAPPING - HS300 - Principles of Management

HS300/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1		1			3	2	2	2	2	2	1

COURSE->PSO MAPPING - HS300 - Principles of Management

HS300/PSO	PSO1	PSO2	PSO3
	1	1	3

CH361

Course Code	Course Name	L-T-P:C	Year of Introduction
CH361	Energy Engineering	3-0-0:3	2016

No.	Course Outcome - CH361 - Energy Engineering	Target
CO1	Demonstrate awareness about the world energy resources and energy consumption	60%
CO2	Describe the applications of the conventional energy resources	60%
CO3	Demonstrate awareness about the applications of solar energy and wind energy	60%
CO4	Demonstrate awareness about the biomass,ocean and geothermal energy resources	60%
CO5	Explain the uses and applications of fuel cells and magnetohydrodynamic generators	60%
CO6	Analyze the energy conservation systems in industries	60%

COURSE END SURVEY - CH361 - Energy Engineering

Sl.No	Questions & Options
CO1	To what extent you have gained knowledge about the world energy resources and energy consumption
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How well can you describe the applications of the conventional energy resources
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extent you have gained knowledge about the applications of solar energy and wind energy
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent you can demonstrate awareness about the biomass,ocean and geothermal energy resources
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	How well can you explain the uses and applications of fuel cells and magnetohydrodynamic generators
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent can you analyze the energy conservation systems in industries
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>

CO->PO MAPPING - CH361 - Energy Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2					2	3	1		2		
CO2	2	1				2	2			1		
CO3	1	1				2	2			1		

CO4	1	1				1	1			1		
CO5	1	1				1	1			1		
CO6	1	1	1	1		1	1			1		

CO->PSO MAPPING - CH361 - Energy Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	2		1
CO2	2	1	1
CO3	2	1	1
CO4	2	1	1
CO5	2	1	1
CO6	2	1	1

COURSE->PO MAPPING - CH361 - Energy Engineering

CH361/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	1	1	1		2	3	1		2		

COURSE->PSO MAPPING - CH361 - Energy Engineering

CH361/PSO	PSO1	PSO2	PSO3
	2	1	1

CH367

Course Code	Course Name	L-T-P:C	Year of Introduction
CH367	Numerical Methods for Process Engineers	3-0-0:3	2016

No.	Course Outcome - CH367 - Numerical Methods for Process Engineers	Target
CO1	Apply the basic concepts of error, convergence etc. in numerical methods	67%
CO2	Solve system of equations using different numerical methods.	67%
CO3	Use suitable interpolation methods to deal with the data in hand	67%
CO4	Choose and apply appropriate numerical schemes to solve differential and integral equations.	67%
CO5	Apply various numerical schemes for solving ODE and PDE.	66%
CO6	Solve initial and final boundary value problems	66%

COURSE END SURVEY - CH367 - Numerical Methods for Process Engineers

Sl.No	Questions & Options
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CO1	To what extent can you apply the basic concepts of error, convergence etc. in numerical methods?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent are you able to solve system of equations using different numerical methods?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent are you able to use suitable interpolation methods to deal with the data in hand?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent are you are able to choose and apply appropriate numerical schemes to solve differential and integral equations?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent are you able to apply various numerical schemes used for solving ODE and PDE?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent are you able to solve initial and final boundary value problems?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH367 - Numerical Methods for Process Engineers

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2							
CO2	3	2	2	1	2							
CO3	2	3	1		2							
CO4	3	2	3		2							
CO5	3	2	1		2							
CO6	3	2	2		2							

CO->PSO MAPPING - CH367 - Numerical Methods for Process Engineers

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	
CO6	2	1	

COURSE->PO MAPPING - CH367 - Numerical Methods for Process Engineers

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CH367/PO	3	3	3	1	2							
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COURSE->PSO MAPPING - CH367 - Numerical Methods for Process Engineers

CH367/PSO	PSO1	PSO2	PSO3
	2	1	

CHT303

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT303	Environmental Engineering	3-1-0:4	2019

COURSE END SURVEY - CHT303 - Environmental Engineering**CO->PO MAPPING - CHT303 - Environmental Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CHT303 - Environmental Engineering

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CHT303 - Environmental Engineering

CHT303/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CHT303 - Environmental Engineering

CHT303/PSO	PSO1	PSO2	PSO3

HUT310

Course Code	Course Name	L-T-P:C	Year of Introduction
HUT310	MANAGEMENT FOR ENGINEERS	3-0-0:3	2019

No.	Course Outcome - HUT310 - MANAGEMENT FOR ENGINEERS	Target
CO1	Recognize the characteristics of management in the contemporary context.	66%
CO2	Describe the functions of management.	66%
CO3	Demonstrate ability in decision making process and productivity analysis.	66%
CO4	Illustrate project management technique and develop a project schedule.	66%
CO5	Summarize the functional areas of management and comprehend the concept of entrepreneurship.	66%

COURSE END SURVEY - HUT310 - MANAGEMENT FOR ENGINEERS

Sl.No	Questions & Options
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CO1	I am able to recognize the characteristics of management in the contemporary context.
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>
CO2	I am able to describe the functions of management.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	I am able to demonstrate the ability of decision making and productivity analysis.
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	I am able to Illustrate project management techniques and develop a project schedule.
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO5	I am able to summarize the functional areas of management and comprehend the concept of entrepreneurship.
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - HUT310 - MANAGEMENT FOR ENGINEERS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

CO->PSO MAPPING - HUT310 - MANAGEMENT FOR ENGINEERS

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - HUT310 - MANAGEMENT FOR ENGINEERS

HUT310/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - HUT310 - MANAGEMENT FOR ENGINEERS

HUT310/PSO	PSO1	PSO2	PSO3

CHL331

Course Code	Course Name	L-T-P:C	Year of Introduction
CHL331	Heat Transfer Operations Lab	0-0-3:2	2019

No.	Course Outcome - CHL331 - Heat Transfer Operations Lab	Target
CO1	Experiment with various modes of heat transfer	65%
CO2	Evaluation the heat transfer coefficients	65%
CO3	Determine the rate of heat transfer in various modes of heat transfer.	65%
CO4	Analyse the working of heat transfer equipments.	65%
CO5	Interpret and present the experimental data meaningfully.	65%

COURSE END SURVEY - CHL331 - Heat Transfer Operations Lab

Sl.No	Questions & Options
CO1	To what extend you are able to do experiment with various modes of heat transfer
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extend you are able to evaluate the heat transfer coefficients
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extend you are able to determine the rate of heat transfer in various modes of heat transfer
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extend you are able to analyze the working of heat transfer equipment
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extend you are able to interpret and present the experimental data meaningfully
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CHL331 - Heat Transfer Operations Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3								3			
CO2		3							3			
CO3		3	2						3			
CO4									3			3
CO5				3					3	3		

CO->PSO MAPPING - CHL331 - Heat Transfer Operations Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3		1
CO2	2		1
CO3	2		1
CO4	2		
CO5	2		

COURSE->PO MAPPING - CHL331 - Heat Transfer Operations Lab

CHL331/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	3					3	3		3

COURSE->PSO MAPPING - CHL331 - Heat Transfer Operations Lab

CHL331/PSO	PSO1	PSO2	PSO3
	3		1

CHL333

Course Code	Course Name	L-T-P:C	Year of Introduction
CHL333	Process Control Lab	0-0-3:2	2019

COURSE END SURVEY - CHL333 - Process Control Lab**CO->PO MAPPING - CHL333 - Process Control Lab**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CHL333 - Process Control Lab

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CHL333 - Process Control Lab

CHL333/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CHL333 - Process Control Lab

CHL333/PSO	PSO1	PSO2	PSO3

MCN301

Course Code	Course Name	L-T-P:C	Year of Introduction
MCN301	Disaster Management	2-0-0:2	2019

No.	Course Outcome - MCN301 - Disaster Management	Target
CO1	To understand the various terminologies in use in disaster management parlance and organize each of these terms in relation to the disaster management cycle	55%
CO2	To understand different hazard types and vulnerability types and do vulnerability assessment	55%
CO3	To understand the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk.	55%
CO4	To apply the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sectors and communities.	55%
CO5	To understand the factors that determine the nature of disaster response and discuss the various disaster response actions.	55%
CO6	To understand the various legislations and best practices for disaster management and risk reduction at the national and international levels.	55%

COURSE END SURVEY - MCN301 - Disaster Management

Sl.No	Questions & Options
CO1	Can you understand the various terminologies in use in disaster management parlance and organize each of these terms in relation to the disaster management cycle?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Can you understand different hazard types and vulnerability types and do vulnerability assessment?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	Can you understand the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	Are you able to apply the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sectors and communities?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	Can you understand the factors that determine the nature of disaster response and discuss the various disaster response actions?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	

CO->PO MAPPING - MCN301 - Disaster Management

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		2				2				2		2
CO2	2	3	2		2	2	3			3		2
CO3	2	3	2	2	2	2	3			3		2

CO4	3	3	3		2	2	3					2
CO5	3	3			2	2	3					2
CO6	3					2	3	3				2

CO->PSO MAPPING - MCN301 - Disaster Management

CO/PSO	PSO1	PSO2	PSO3
CO1	1		2
CO2	3	2	
CO3	3	2	
CO4	3	3	1
CO5	1	2	3
CO6			2

COURSE->PO MAPPING - MCN301 - Disaster Management

MCN301/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	2	2	3	3		3		2

COURSE->PSO MAPPING - MCN301 - Disaster Management

MCN301/PSO	PSO1	PSO2	PSO3
	3	3	3

CHT305

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT305	CHEMICAL REACTION ENGINEERING	3-1-0:4	2019

No.	Course Outcome - CHT305 - CHEMICAL REACTION ENGINEERING	Target
CO1	Explain the principles of chemical kinetics and determine chemical kinetic parameters using batch reactor data	60.5%
CO2	Design of chemical reactors under ideal conditions	60.5%
CO3	Design of single and multiple reactions in ideal reactors	60.5%
CO4	Design chemical reactors for non-isothermal operations	60.5%
CO5	Design chemical reactors for non ideal conditions	60.5%

COURSE END SURVEY - CHT305 - CHEMICAL REACTION ENGINEERING

Sl.No	Questions & Options

CO1	CO2
CO3	CO4
CO5	

CO->PO MAPPING - CHT305 - CHEMICAL REACTION ENGINEERING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3										
CO2	3	2	3									
CO3	3	2	3									
CO4	3	2	3									
CO5	3	2	3									

CO->PSO MAPPING - CHT305 - CHEMICAL REACTION ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - CHT305 - CHEMICAL REACTION ENGINEERING

CHT305/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3									

COURSE->PSO MAPPING - CHT305 - CHEMICAL REACTION ENGINEERING

CHT305/PSO	PSO1	PSO2	PSO3

CHT301

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT301	MASS TRANSFER OPERATIONS -I	3-1-0:4	2019

No.	Course Outcome - CHT301 - MASS TRANSFER OPERATIONS - I	Target
CO1	Analyse fundamentals of mass transfer operations and estimate diffusion coefficients	50%
CO2	Summarize interface mass transfer and concepts of mass transfer coefficients	50%

CO3	Differentiate among different types of equipments for mass transfer operations	55%
CO4	Analyse and design tray and packed columns of gas liquid contacting equipments	50%
CO5	Analyse and design humidification and adsorption systems	50%
CO6	Analyse and design drying and crystallization systems.	50%

COURSE END SURVEY - CHT301 - MASS TRANSFER OPERATIONS -I

Sl.No	Questions & Options
CO1	CO2
CO3	CO4
CO5	CO6

CO->PO MAPPING - CHT301 - MASS TRANSFER OPERATIONS -I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3										
CO2	3	3										
CO3	3											
CO4	3	3	3									
CO5	3	3										
CO6	3	3										

CO->PSO MAPPING - CHT301 - MASS TRANSFER OPERATIONS -I

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - CHT301 - MASS TRANSFER OPERATIONS -I

CHT301/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3									

COURSE->PSO MAPPING - CHT301 - MASS TRANSFER OPERATIONS -I

CHT301/PSO	PSO1	PSO2	PSO3

CHT307

Course Code	Course Name	L-T-P:C	Year of Introduction
CHT307	INSTRUMENTATION AND PROCESS CONTROL	3-1-0:4	2019

No.	Course Outcome - CHT307 - INSTRUMENTATION AND PROCESS CONTROL	Target
CO1	Categorize measuring instruments for industrial applications and illustrate instrumentation for temperature, pressure, flow, level, composition and pH	61%
CO2	Apply Laplace transforms to solve linear differential equations and to obtain the transfer function related to first order systems.	62%
CO3	Develop the response of linear open loop second order systems and systems in series for various forcing functions.	63%
CO4	Describe various types of controllers and analyse servo and regulatory problems of closed loop systems by using transient response.	64%
CO5	Analyze the stability of linear systems by using analytical and graphical methods. Design controllers.	65%

COURSE END SURVEY - CHT307 - INSTRUMENTATION AND PROCESS CONTROL

Sl.No	Questions & Options
CO1	How far you were able to understand the working, principle and applications of industrial measuring instruments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	able to solve and understand the transfer functions related to first order systems
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO3	Able to develop the response of linear open loop systems and systems in series for various input functions
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO4	Get a thorough knowledge about types of controllers and is able to solve the servo and regulatory problems of closed loop systems
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	Able to analyze stability of linear systems by using analytical and graphical methods
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO->PO MAPPING - CHT307 - INSTRUMENTATION AND PROCESS CONTROL

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3								
CO2	3	3	3	3								
CO3	3	3	3	3								

CO4	3	3	3	3								
CO5	3	3	3	3								

CO->PSO MAPPING - CHT307 - INSTRUMENTATION AND PROCESS CONTROL

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - CHT307 - INSTRUMENTATION AND PROCESS CONTROL

CHT307/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3								

COURSE->PSO MAPPING - CHT307 - INSTRUMENTATION AND PROCESS CONTROL

CHT307/PSO	PSO1	PSO2	PSO3

SEMESTER-6**CH010601**

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010601	Mass transfer operations II	4-0-0:4	2010

COURSE END SURVEY - CH010601 - Mass transfer operations II**CO->PO MAPPING - CH010601 - Mass transfer operations II**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010601 - Mass transfer operations II

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010601 - Mass transfer operations II

CH010601/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010601 - Mass transfer operations II

CH010601/PSO	PSO1	PSO2	PSO3

CH010602

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010602	Environmental Engineering	4-0-0:4	2010

COURSE END SURVEY - CH010602 - Environmental Engineering**CO->PO MAPPING - CH010602 - Environmental Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010602 - Environmental Engineering

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010602 - Environmental Engineering

CH010602/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010602 - Environmental Engineering

CH010602/PSO	PSO1	PSO2	PSO3

CH010603

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010603	CHEMICAL TECHNOLOGY II	4-0-0:4	2010

COURSE END SURVEY - CH010603 - CHEMICAL TECHNOLOGY II**CO->PO MAPPING - CH010603 - CHEMICAL TECHNOLOGY II**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010603 - CHEMICAL TECHNOLOGY II

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010603 - CHEMICAL TECHNOLOGY II

CH010603/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010603 - CHEMICAL TECHNOLOGY II

CH010603/PSO	PSO1	PSO2	PSO3

CH010604

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010604	Process dynamics and control	4-0-0:4	2010

COURSE END SURVEY - CH010604 - Process dynamics and control**CO->PO MAPPING - CH010604 - Process dynamics and control**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010604 - Process dynamics and control

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010604 - Process dynamics and control

CH010604/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010604 - Process dynamics and control

CH010604/PSO	PSO1	PSO2	PSO3

CH010606L01

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010606L01	MATERIAL SCIENCE AND ENGINEERING	4-0-0:4	2010

COURSE END SURVEY - CH010606L01 - MATERIAL SCIENCE AND ENGINEERING**CO->PO MAPPING - CH010606L01 - MATERIAL SCIENCE AND ENGINEERING**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010606L01 - MATERIAL SCIENCE AND ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010606L01 - MATERIAL SCIENCE AND ENGINEERING

CH010606L01/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010606L01 - MATERIAL SCIENCE AND ENGINEERING

CH010606L01/PSO	PSO1	PSO2	PSO3

CH010606L05

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010606L05	MODELING AND SIMULATION FOR PROCESS INDUSTRIES	4-0-0:4	2010

COURSE END SURVEY - CH010606L05 - MODELING AND SIMULATION FOR PROCESS INDUSTRIES**CO->PO MAPPING - CH010606L05 - MODELING AND SIMULATION FOR PROCESS INDUSTRIES**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010606L05 - MODELING AND SIMULATION FOR PROCESS INDUSTRIES

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010606L05 - MODELING AND SIMULATION FOR PROCESS INDUSTRIES

CH010606L05/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010606L05 - MODELING AND SIMULATION FOR PROCESS INDUSTRIES

CH010606L05/PSO	PSO1				PSO2				PSO3			

CH010607

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010607	ENVIRONMENTAL ENGINEERING LAB	0-0-4:0	2010

COURSE END SURVEY - CH010607 - ENVIRONMENTAL ENGINEERING LAB**CO->PO MAPPING - CH010607 - ENVIRONMENTAL ENGINEERING LAB**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010607 - ENVIRONMENTAL ENGINEERING LAB

CO/PSO	PSO1				PSO2				PSO3			

COURSE->PO MAPPING - CH010607 - ENVIRONMENTAL ENGINEERING LAB

CH010607/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010607 - ENVIRONMENTAL ENGINEERING LAB

CH010607/PSO	PSO1				PSO2				PSO3			

CH010608

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010608	Heat Transfer Operations Lab	0-0-4:0	2010

COURSE END SURVEY - CH010608 - Heat Transfer Operations Lab**CO->PO MAPPING - CH010608 - Heat Transfer Operations Lab**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010608 - Heat Transfer Operations Lab

CO/PSO	PSO1				PSO2				PSO3			

COURSE->PO MAPPING - CH010608 - Heat Transfer Operations Lab

CH010608/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010608 - Heat Transfer Operations Lab

CH010608/PSO	PSO1	PSO2	PSO3

CH010605

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010605	chemical reaction engineering II	4-0-0:4	2010

COURSE END SURVEY - CH010605 - chemical reaction engineering II**CO->PO MAPPING - CH010605 - chemical reaction engineering II**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010605 - chemical reaction engineering II

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH010605 - chemical reaction engineering II

CH010605/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010605 - chemical reaction engineering II

CH010605/PSO	PSO1	PSO2	PSO3

CH010606L04

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010606L04	Energy Engineering	4-0-0:4	2010

COURSE END SURVEY - CH010606L04 - Energy Engineering**CO->PO MAPPING - CH010606L04 - Energy Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010606L04 - Energy Engineering

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH010606L04 - Energy Engineering

CH010606L04/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010606L04 - Energy Engineering

CH010606L04/PSO	PSO1	PSO2	PSO3

English

Course Code	Course Name	L-T-P:C	Year of Introduction
English	English	4-0-0:4	2010

COURSE END SURVEY - English - English**CO->PO MAPPING - English - English**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - English - English

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - English - English

English/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - English - English

English/PSO	PSO1	PSO2	PSO3

CH304

Course Code	Course Name	L-T-P:C	Year of Introduction
CH304	Inorganic chemical technology	3-0-0:3	2016

No.	Course Outcome - CH304 - Inorganic chemical technology	Target
CO1	Explain various process engineering techniques used manufacturing of industrial gases and acids	67.5%
CO2	Describe various unit operations and process involved in Chlor- alkali, various sodium salts industries	67.5%
CO3	Analyze different unit processes and unit operations in glass industries	67.5%
CO4	Choose best process for a particular product from among different alternatives available in surface coating manufacturing industry	67.5%
CO5	Troubleshoot various errors in process lines, vessels, and reactions of Fertilizer manufacturing industries	67.5%
CO6	Describe various unit operations and process involved in Cement, electrothermal industries	67.5%

COURSE END SURVEY - CH304 - Inorganic chemical technology

Sl.No	Questions & Options
CO1	To what extend Explain various process engineering techniques used manufacturing of industrial gases and acids Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO2	To what extend you can describe various unit operations and process involved in Chlor- alkali, various sodium salts industries

	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extend you can analyze different unit processes and unit operations in glass industries
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extend you can select best process for a particular product from among different alternatives available in surface coating manufacturing industry
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	How far can you can troubleshoot various errors in process lines, vessels, and reactions of Fertilizer manufacturing industries
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO6	To what extend can you describe various unit operations and process involved in Cement, electrothermal industries
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - CH304 - Inorganic chemical technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2					1	1			1	1	
CO2	2					1	1			1	1	
CO3	1					1	1			1	1	
CO4	2	1	1			1	1			1	1	
CO5	2	1	1			1	1			1	1	
CO6	2	1	1			1	1			1	1	

CO->PSO MAPPING - CH304 - Inorganic chemical technology

CO/PSO	PSO1	PSO2	PSO3
CO1	1		1
CO2	1		1
CO3	1		1
CO4	1		1
CO5	1		1
CO6	1		1

COURSE->PO MAPPING - CH304 - Inorganic chemical technology

CH304/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	1	1			1	1			1	1	

COURSE->PSO MAPPING - CH304 - Inorganic chemical technology

CH304/PSO	PSO1	PSO2	PSO3
	1		1

CH306

Course Code	Course Name	L-T-P:C	Year of Introduction
CH306	Mass transfer operations II	3-0-0:3	2016

No.	Course Outcome - CH306 - Mass transfer operations II	Target
CO1	Explain the process of distillation	58%
CO2	Design fractionation columns by McCabe-Thiele method	58%
CO3	Design distillation tower by Ponchon-Savarit method	58%
CO4	Design extraction equipments	60%
CO5	Design leaching equipments	60%
CO6	Explain membrane separation process	60%

COURSE END SURVEY - CH306 - Mass transfer operations II

Sl.No	Questions & Options
CO1	To what extend you are able to explain the process of distillation
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	To what extend you are able to design fractionation columns by McCabe-Thiele method
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extend you are able to design distillation tower by Ponchon-Savarit method
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	To what extend you are able to design extraction equipments
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	To what extend you are able to design leaching equipments
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO6	To what extend you are able to explain membrane separation process
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>

CO->PO MAPPING - CH306 - Mass transfer operations II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	1	1										
CO2	2	2	3	1	1							
CO3	2	2	3	1	1							
CO4	2	2	3	1	1							
CO5	2	2	3	1	1							
CO6	2	1										

CO->PSO MAPPING - CH306 - Mass transfer operations II

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	
CO6	2		

COURSE->PO MAPPING - CH306 - Mass transfer operations II

CH306/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	3	1	1							

COURSE->PSO MAPPING - CH306 - Mass transfer operations II

CH306/PSO	PSO1	PSO2	PSO3
	3	1	

CH308

Course Code	Course Name	L-T-P:C	Year of Introduction
CH308	chemical reaction engineering II	3-0-0:3	2016

No.	Course Outcome - CH308 - chemical reaction engineering II	Target
CO1	Evaluate the non-ideal behavior in chemical reactors by RTD studies	62%
CO2	Use RTD based models to evaluate reactor conversions	62%
CO3	Analyze the kinetics and design aspects of catalytic and non-catalytic heterogeneous reactions	62%
CO4	Formulate and solve energy balances for non-isothermal operation of chemical reactors	62%

CO5	Design chemical reactors for non-isothermal operations	62%
CO6	Evaluate the stability and safety of chemical reactors	62%

COURSE END SURVEY - CH308 - chemical reaction engineering II

Sl.No	Questions & Options
CO1	To what extent you can evaluate the non-ideal behavior in chemical reactors by RTD studies
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent are you able to use RTD based models to evaluate reactor conversions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent can you analyze the kinetics and design aspects of catalytic and non-catalytic heterogeneous reactions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent can you formulate and solve energy balances for non-isothermal operation of chemical reactors
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent can you design chemical reactors for non-isothermal operations
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent can you evaluate the stability and safety of chemical reactors
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH308 - chemical reaction engineering II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1		1							
CO2	3	2	1		1							
CO3	3	2	2	1	1							
CO4	3	2	2	1	1							
CO5	3	3	3	1	1							
CO6	2	1	1				1					

CO->PSO MAPPING - CH308 - chemical reaction engineering II

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	

CO4	3	2	
CO5	3	2	
CO6	1	1	

COURSE->PO MAPPING - CH308 - chemical reaction engineering II

CH308/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	1		1					

COURSE->PSO MAPPING - CH308 - chemical reaction engineering II

CH308/PSO	PSO1	PSO2	PSO3
	3	2	

CH312

Course Code	Course Name	L-T-P:C	Year of Introduction
CH312	Chemical engineering design- I	3-0-0:3	2016

No.	Course Outcome - CH312 - Chemical engineering design- I	Target
CO1	Demonstrate general P&ID symbols and I&C drawings used in Chemical Engineering practice.	62%
CO2	Design Pressure vessels and jacketed vessels using given process parameters.	62%
CO3	Design tall columns, supports and non-standard flanges for a vessel with given specifications.	62%
CO4	Design storage vessels for volatile and non-volatile liquids using given process conditions.	62%
CO5	Design heat transfer equipment like double pipe heat exchanger, shell and tube heat exchanger and condenser.	62%
CO6	Construct detailed proportionate drawings of double pipe heat exchanger, shell and tube heat exchanger and condenser.	62%

COURSE END SURVEY - CH312 - Chemical engineering design- I

Sl.No	Questions & Options
CO1	To what extend you are able to Demonstrate general P&ID symbols and I&C drawings used in Chemical Engineering practice
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extend you are able to Design Pressure vessels and jacketed vessels using given process parameters.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extend you are able to Design tall columns, supports and non-standard flanges for a vessel with given specifications

	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extend you are able to Design storage vessels for volatile and non-volatile liquids using given process conditions.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extend you are able to Design heat transfer equipment like double pipe heat exchanger, shell and tube heat exchanger and condenser
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extend you are able to Construct detailed proportionate drawings of double pipe heat exchanger, shell and tube heat exchanger and condenser
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH312 - Chemical engineering design- I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2		1		2					1		
CO2	3	2	3	1	2							
CO3	3	2	3	1	2							
CO4	3	2	3	1	2							
CO5	3	2	3	1	2							
CO6	2	2	3	1	2							

CO->PSO MAPPING - CH312 - Chemical engineering design- I

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
CO6	1	1	

COURSE->PO MAPPING - CH312 - Chemical engineering design- I

CH312/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	1	2					1		

COURSE->PSO MAPPING - CH312 - Chemical engineering design- I

CH312/PSO	PSO1	PSO2	PSO3
	3	2	

CH332

Course Code	Course Name	L-T-P:C	Year of Introduction
CH332	Mass transfer operations lab	0-0-3:1	2016

No.	Course Outcome - CH332 - Mass transfer operations lab	Target
CO1	Determine the percentage actual recovery of solutes using various leaching methods such as simple leaching, cross current leaching, and counter current leaching	63%
CO2	Plan and execute experiments on adsorption isotherm and ternary liquid equilibrium	63%
CO3	Determine the rate of batch drying and diffusion of vapor in air	63%
CO4	Plan and execute experiments on simple distillation and liquid-liquid extraction	63%
CO5	Plan and perform experiments using equipment used in industrial operations such as packed bed absorption and packed bed distillation	63%

COURSE END SURVEY - CH332 - Mass transfer operations lab

Sl.No	Questions & Options
CO1	To what extent you are able to determine the percentage actual recovery of solutes using various leaching methods such as simple leaching, cross current leaching, and counter current leaching?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to plan and execute experiments on adsorption isotherm and ternary liquid equilibrium?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to determine the rate of batch drying and diffusion of vapor in air?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to plan and execute experiments on simple distillation and liquid-liquid extraction?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to plan and perform experiments using equipment used in industrial operations such as packed bed absorption and packed bed distillation?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH332 - Mass transfer operations lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	2				2	1		1
CO2	3	1	2	1	2				2	1		1
CO3	3	1	2	1	2				2	1		1

CO4	3	1	2	1	2				2	1		1
CO5	3	1	2	1	2				2	1		1

CO->PSO MAPPING - CH332 - Mass transfer operations lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	2	1
CO5	3	2	1

COURSE->PO MAPPING - CH332 - Mass transfer operations lab

CH332/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	2	1	2				2	1		1

COURSE->PSO MAPPING - CH332 - Mass transfer operations lab

CH332/PSO	PSO1	PSO2	PSO3
	3	2	1

CH334

Course Code	Course Name	L-T-P:C	Year of Introduction
CH334	Programming and process simulation lab	0-0-3:1	2016

No.	Course Outcome - CH334 - Programming and process simulation lab	Target
CO1	Develop software programmes for simulating Chemical Engineering problems using MS Excel	66%
CO2	Model and simulate typical chemical plants using Scilab	66%
CO3	Model and simulate the control systems using scilab	66%
CO4	Model and simulate the chemical process plant using DWSIM	66%
CO5	Develop C++ programmes to implement numerical methods	66%

COURSE END SURVEY - CH334 - Programming and process simulation lab

Sl.No	Questions & Options
CO1	To what extent you are able to Develop software programmes for simulating Chemical Engineering problems using MS Excel
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO2	To what extend you are able to Model and simulate typical chemical plants using SCILAB
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extend you are able to Apply modelling in scilab
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extend you are able to Apply numerical methods in DWSIM
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extend you are able to Apply DESIGN OF CHEMICAL ENGINEERING PLANT in DWSIM
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH334 - Programming and process simulation lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	3				3	2		1
CO2	3	3	3	2	3				2	2		1
CO3	2	2	2	1	3				2	2		1
CO4	2	2	2	1	3				2	2		1
CO5	2	2	2	1	3				2	2		1

CO->PSO MAPPING - CH334 - Programming and process simulation lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	2
CO2	3	3	2
CO3	3	1	2
CO4	3	1	2
CO5	3	1	2

COURSE->PO MAPPING - CH334 - Programming and process simulation lab

CH334/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	3				3	2		1

COURSE->PSO MAPPING - CH334 - Programming and process simulation lab

CH334/PSO	PSO1	PSO2	PSO3
	3	3	2

CH352

Course Code	Course Name	L-T-P:C	Year of Introduction
CH352	Comprehensive Exam	0-1-1:2	2016

No.	Course Outcome - CH352 - Comprehensive Exam	Target
CO1	Discuss confidently the fundamental aspects of Chemical Engineering	67%
CO2	Demonstrate the depth and breadth of their knowledge on subjects studied in the previous semester	67%
CO3	Evaluate their own theoretical and applied competencies in Chemical Engineering field	67%
CO4	Identify the need for further enhancing knowledge and lifelong learning	67%
CO5	Perform confidently during an interview	67%
CO6	Debate and answer questions of the chosen topic with depth and clarity	67%

COURSE END SURVEY - CH352 - Comprehensive Exam

Sl.No	Questions & Options
CO1	To what extend you are able to Discuss confidently the fundamental aspects of Chemical Engineering
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extend you are able to Demonstrate the depth and breadth of their knowledge on subjects studied in the previous semester
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extend you are able to evaluate your own theoretical and applied competencies in Chemical Engineering field
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extend you are able to Identify the need for further enhancing knowledge and lifelong learning
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extend you are able to Perform confidently during an interview
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extend you are able to Debate and answer questions of the chosen topic with depth and clarity
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH352 - Comprehensive Exam

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1		1				3	2		1
CO2	3	3	2	1	2	2	2	3	3	2	2	1
CO3	3	2	2	1	2	1	2	2	2	2	2	1

CO4						3	3		2	3		3
CO5									3	3		1
CO6			1			1		1	3	2	1	

CO->PSO MAPPING - CH352 - Comprehensive Exam

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	2
CO3	1	1	2
CO4		2	2
CO5			2
CO6			3

COURSE->PO MAPPING - CH352 - Comprehensive Exam

CH352/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	1	2	3	3	3	3	3	2	3

COURSE->PSO MAPPING - CH352 - Comprehensive Exam

CH352/PSO	PSO1	PSO2	PSO3
	2	2	3

CH372

Course Code	Course Name	L-T-P:C	Year of Introduction
CH372	Catalyst Science and Catalytic Processes	3-0-0:3	2016

No.	Course Outcome - CH372 - Catalyst Science and Catalytic Processes	Target
CO1	Explain the general characteristics of catalysts and the principle behind the catalytic activity	62%
CO2	Outline appropriate preparative method for a catalyst	61%
CO3	Apply the basic concepts and theory for characterization of catalysts	62%
CO4	Identify various industrial catalysts	65%
CO5	Analyze catalyst deactivation	62%
CO6	Describe modern trends in catalyst technology	62%

COURSE END SURVEY - CH372 - Catalyst Science and Catalytic Processes

Sl.No	Questions & Options
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CO1	To what extent you are able to explain the general characteristics of catalysts and the principle behind the catalytic activity?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to outline appropriate preparative method for a catalyst?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to apply the basic concepts and theory for characterization of catalysts?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to identify various industrial catalysts?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to analyze catalyst deactivation?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to describe modern trends in catalyst technology?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH372 - Catalyst Science and Catalytic Processes

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1		1								
CO2	3											
CO3	3	1										
CO4	2	1	1									
CO5	2	1	1									
CO6	2											

CO->PSO MAPPING - CH372 - Catalyst Science and Catalytic Processes

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2		1	
CO3	2	1	
CO4	2	1	
CO5	1		
CO6	1	1	

COURSE->PO MAPPING - CH372 - Catalyst Science and Catalytic Processes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CH372/PO	3	1	1	1								
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COURSE->PSO MAPPING - CH372 - Catalyst Science and Catalytic Processes

CH372/PSO	PSO1	PSO2	PSO3
	2	1	

CH362

Course Code	Course Name	L-T-P:C	Year of Introduction
CH362	Non-Conventional Petroleum Resources	3-0-0:3	2016

No.	Course Outcome - CH362 - Non-Conventional Petroleum Resources	Target
CO1	Describe the concepts pertaining to non-conventional petroleum resources	60%
CO2	Apply the concepts related to exploration and development of Shale Gas Reservoirs	60%
CO3	Apply the concepts related to exploration and development of Coal Bed Methane	60%
CO4	Demonstrate awareness related to the concepts related to formation of gas hydrates	60%
CO5	Apply the concepts related to different conversion processes for the production of hydrocarbons	60%
CO6	Demonstrate awareness related to environmental issues involved in the development of non-conventional hydrocarbon resources	60%

COURSE END SURVEY - CH362 - Non-Conventional Petroleum Resources

Sl.No	Questions & Options
CO1	To what extent you are able to describe the concepts pertaining to non-conventional petroleum resources?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you can apply the concepts related to exploration and development of Shale Gas Reservoirs to non conventional resources
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able apply the concepts related to Coal Bed Methane to non conventional energy
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO4	To what extent you have developed an awareness related to the concepts related to formation of gas hydrates
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	To what extent you can apply the concepts related to different conversion processes for the production of hydrocarbons
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO6	To what extent you have developed an awareness related to environmental issues involved in the development of non-conventional hydrocarbon resources
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - CH362 - Non-Conventional Petroleum Resources

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2					1	1					
CO2	2	1	1		1	1	1					
CO3	2	1	1		1	1	1					
CO4	2	1	1		1	1	1					
CO5	2	1	1		1	1	1					1
CO6	2	1	1		1	3	3	3	2	1		

CO->PSO MAPPING - CH362 - Non-Conventional Petroleum Resources

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	
CO6	2	1	2

COURSE->PO MAPPING - CH362 - Non-Conventional Petroleum Resources

CH362/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	1	1		1	3	3	3	2	1		1

COURSE->PSO MAPPING - CH362 - Non-Conventional Petroleum Resources

CH362/PSO	PSO1	PSO2	PSO3
	2	1	2

CH302

Course Code	Course Name	L-T-P:C	Year of Introduction
CH302	Process dynamics and control	3-1-0:4	2016

No.	Course Outcome - CH302 - Process dynamics and control	Target
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CO1	[1] Solve the differential equations using Laplace transforms	72%
CO2	[2] Determine transfer function for simple chemical process systems	66%
CO3	[3] Develop control system block diagram and reduce a given block diagram to input /output transfer function model.	67%
CO4	[4] Analyze the stability of open loop and closed loop systems	72%
CO5	[5] Determine the tuning parameters of controllers	66%
CO6	[6] Describe the types of controllers and advanced control systems	66%

COURSE END SURVEY - CH302 - Process dynamics and control

Sl.No	Questions & Options
CO1	What is your ability to solve differential equations using Laplace transforms
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Are you able to develop transfer functions for simple chemical process systems
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	What is the level of your ability to convert physical systems into block diagrams and develop input-output transfer functions from these diagrams
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	Describe your ability to analyze the stability of open and closed loop systems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	Indicate your ability to tune and set controllers
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	How do you rate your ability to describe the different types of controllers and advanced control system
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH302 - Process dynamics and control

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	2							
CO2	3	3	2	2	2							
CO3	2	2	2	1								
CO4	2	2	3	2	1							
CO5	1	1	1	1	1							
CO6	2											

CO->PSO MAPPING - CH302 - Process dynamics and control

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	2	1	
CO4	3	1	
CO5	2		
CO6	1		

COURSE->PO MAPPING - CH302 - Process dynamics and control

CH302/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	2							

COURSE->PSO MAPPING - CH302 - Process dynamics and control

CH302/PSO	PSO1	PSO2	PSO3
	3	2	

CH374

Course Code	Course Name	L-T-P:C	Year of Introduction
CH374	Process Design for Pollution Control	3-0-0:3	2016

No.	Course Outcome - CH374 - Process Design for Pollution Control	Target
CO1	understand the importance of protection and improvement of the environment	60%
CO2	to monitor and design water pollution control systems	60%
CO3	design air pollution control devices	60%
CO4	to understand biomedical pollution control	60%
CO5	design pollution control equipments like incinerator and microwave	60%

COURSE END SURVEY - CH374 - Process Design for Pollution Control

Sl.No	Questions & Options
CO1	to which extend where you are to understand the importance of protection and improvement of the environment
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	to what level where you are able to design water pollution control system
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO3	to what level where you able to design air pollution control devices
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	to what extend you where able to understand biomedical pollution control
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	to what level where you able to design pollution control equipments like incinerator and microwave
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH374 - Process Design for Pollution Control

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1										
CO2	2											
CO3	2		2	1	1	2						
CO4	2											
CO5	3											

CO->PSO MAPPING - CH374 - Process Design for Pollution Control

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - CH374 - Process Design for Pollution Control

CH374/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	2	1	1	2						

COURSE->PSO MAPPING - CH374 - Process Design for Pollution Control

CH374/PSO	PSO1	PSO2	PSO3

CH364

Course Code	Course Name	L-T-P:C	Year of Introduction
CH364	Bioprocess Engineering	3-0-0:3	2016

No.	Course Outcome - CH364 - Bioprocess Engineering	Target
CO1	Understand industrial fermentation and design an industrial fermenter	60%
CO2	Distinguish between primary and secondary metabolites	60%
CO3	Identify the process technologies for commercial production of microbial products	60%
CO4	Summarize the production of enzymes and its applications	60%
CO5	Explain the role of microorganisms in bioremediation and in agriculture	60%
CO6	Recognize the role of microbial products in medical therapy and food industries	60%

COURSE END SURVEY - CH364 - Bioprocess Engineering

Sl.No	Questions & Options
CO1	To what extent you have understood industrial fermentation processes?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	How well can you distinguish between the applications of primary and secondary metabolites?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	How well can you describe the process technologies for commercial production of microbial products?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	To what extent can you summarize the production of enzymes and its applications
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent can you explain the role of microorganisms in bioremediation and in agriculture?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO6	To what extent can you recognize the role of microbial products in medical therapy and food industries?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - CH364 - Bioprocess Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	3		2							
CO2	2											
CO3	2											
CO4	2											
CO5	2											
CO6	2											

CO->PSO MAPPING - CH364 - Bioprocess Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	
CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	2	
CO6	2	1	

COURSE->PO MAPPING - CH364 - Bioprocess Engineering

CH364/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	3		2							

COURSE->PSO MAPPING - CH364 - Bioprocess Engineering

CH364/PSO	PSO1	PSO2	PSO3
	2	2	

Ch366

Course Code	Course Name	L-T-P:C	Year of Introduction
Ch366	Corrosion Engineering	3-0-0:3	2016

No.	Course Outcome - Ch366 - Corrosion Engineering	Target
CO1	Define corrosion and understand the principles of corrosion	60%
CO2	Identify and classify various types of corrosion	60%
CO3	Understand the different methods of corrosion testing	60%
CO4	Understand the corrosion prevention methods and design techniques	60%
CO5	Understand the composition of engineering materials and the effects of corrosion on them	60%
CO6	Study and evaluate the corrosion and its prevention in various engineering fields	60%

COURSE END SURVEY - Ch366 - Corrosion Engineering

Sl.No	Questions & Options
CO1	To what extend you are able to define corrosion and understand the principles of corrosion?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend you are able to identify and classify various types of corrosion?

	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend you are able to understand the different methods of corrosion testing?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend you are able to understand the corrosion prevention methods and design techniques?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend you are able to understand the composition of engineering materials and the effects of corrosion on them?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend you are able to study and evaluate the corrosion and its prevention in various engineering fields?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - Ch366 - Corrosion Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1								
CO2	3	2	1	2								
CO3	3	2	2	2		1			2	2		1
CO4	3	3	3	3	2	2			1	1		1
CO5	3	3	2	1	1	1			1	1		1
CO6	3	3	3	3	1	2	2		2	2	2	1

CO->PSO MAPPING - Ch366 - Corrosion Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	1
CO2	3	3	1
CO3	3	3	2
CO4	3	3	2
CO5	3	3	1
CO6	3	3	3

COURSE->PO MAPPING - Ch366 - Corrosion Engineering

Ch366/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2	2	2		2	2	2	1

COURSE->PSO MAPPING - Ch366 - Corrosion Engineering

Ch366/PSO	PSO1	PSO2	PSO3
	3	3	3

SEMESTER-7**CH010701**

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010701	CHEMICAL ENGINEERING DESIGN AND DRAWING I	4-0-0:4	2010

COURSE END SURVEY - CH010701 - CHEMICAL ENGINEERING DESIGN AND DRAWING I**CO->PO MAPPING - CH010701 - CHEMICAL ENGINEERING DESIGN AND DRAWING I**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010701 - CHEMICAL ENGINEERING DESIGN AND DRAWING I

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010701 - CHEMICAL ENGINEERING DESIGN AND DRAWING I

CH010701/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010701 - CHEMICAL ENGINEERING DESIGN AND DRAWING I

CH010701/PSO	PSO1	PSO2	PSO3

CH010702

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010702	Process Instrumentation	4-0-0:4	2010

COURSE END SURVEY - CH010702 - Process Instrumentation**CO->PO MAPPING - CH010702 - Process Instrumentation**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010702 - Process Instrumentation

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010702 - Process Instrumentation

CH010702/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010702 - Process Instrumentation

CH010702/PSO	PSO1	PSO2	PSO3

CH010703

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010703	Transport Phenomenon	4-0-0:4	2010

COURSE END SURVEY - CH010703 - Transport Phenomenon**CO->PO MAPPING - CH010703 - Transport Phenomenon**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010703 - Transport Phenomenon

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010703 - Transport Phenomenon

CH010703/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010703 - Transport Phenomenon

CH010703/PSO	PSO1	PSO2	PSO3

CH010704

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010704	PETROLEUM REFINERY ENGINEERING ANDPETROCHEMICALS	4-0-0:4	2010

COURSE END SURVEY - CH010704 - PETROLEUM REFINERY ENGINEERING ANDPETROCHEMICALS**CO->PO MAPPING - CH010704 - PETROLEUM REFINERY ENGINEERING ANDPETROCHEMICALS**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010704 - PETROLEUM REFINERY ENGINEERING ANDPETROCHEMICALS

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010704 - PETROLEUM REFINERY ENGINEERING ANDPETROCHEMICALS

CH010704/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010704 - PETROLEUM REFINERY ENGINEERING ANDPETROCHEMICALS

CH010704/PSO	PSO1	PSO2	PSO3

CH010706L04

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010706L04	FOOD TECHNOLOGY AND ENGINEERING	4-0-0:4	2010

COURSE END SURVEY - CH010706L04 - FOOD TECHNOLOGY AND ENGINEERING**CO->PO MAPPING - CH010706L04 - FOOD TECHNOLOGY AND ENGINEERING**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010706L04 - FOOD TECHNOLOGY AND ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010706L04 - FOOD TECHNOLOGY AND ENGINEERING

CH010706L04/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010706L04 - FOOD TECHNOLOGY AND ENGINEERING

CH010706L04/PSO	PSO1	PSO2	PSO3

CH010706L05

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010706L05	BIOCHEMICAL ENGINEERING	4-0-0:4	2010

COURSE END SURVEY - CH010706L05 - BIOCHEMICAL ENGINEERING**CO->PO MAPPING - CH010706L05 - BIOCHEMICAL ENGINEERING**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010706L05 - BIOCHEMICAL ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010706L05 - BIOCHEMICAL ENGINEERING

CH010706L05/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010706L05 - BIOCHEMICAL ENGINEERING

CH010706L05/PSO	PSO1	PSO2	PSO3

CH010707

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010707	CHEMICAL ENGINEERING DESIGN SOFTWARE LAB	0-0-4:0	2010

COURSE END SURVEY - CH010707 - CHEMICAL ENGINEERING DESIGN SOFTWARE LAB

CO->PO MAPPING - CH010707 - CHEMICAL ENGINEERING DESIGN SOFTWARE LAB

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010707 - CHEMICAL ENGINEERING DESIGN SOFTWARE LAB

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010707 - CHEMICAL ENGINEERING DESIGN SOFTWARE LAB

CH010707/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010707 - CHEMICAL ENGINEERING DESIGN SOFTWARE LAB

CH010707/PSO	PSO1	PSO2	PSO3

CH010708

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010708	Mass transfer operations lab	0-0-4:0	2010

COURSE END SURVEY - CH010708 - Mass transfer operations lab**CO->PO MAPPING - CH010708 - Mass transfer operations lab**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010708 - Mass transfer operations lab

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010708 - Mass transfer operations lab

CH010708/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010708 - Mass transfer operations lab

CH010708/PSO	PSO1	PSO2	PSO3

CH010709

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010709	Seminar	4-0-0:4	2010

COURSE END SURVEY - CH010709 - Seminar**CO->PO MAPPING - CH010709 - Seminar**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010709 - Seminar

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010709 - Seminar

CH010709/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010709 - Seminar

CH010709/PSO	PSO1	PSO2	PSO3

CH010705

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010705	ECONOMICS AND MANAGEMENT FOR PROCESS INDUSTRIES	4-0-0:4	2010

COURSE END SURVEY - CH010705 - ECONOMICS AND MANAGEMENT FOR PROCESS INDUSTRIES**CO->PO MAPPING - CH010705 - ECONOMICS AND MANAGEMENT FOR PROCESS INDUSTRIES**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010705 - ECONOMICS AND MANAGEMENT FOR PROCESS INDUSTRIES

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH010705 - ECONOMICS AND MANAGEMENT FOR PROCESS INDUSTRIES

CH010705/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010705 - ECONOMICS AND MANAGEMENT FOR PROCESS INDUSTRIES

CH010705/PSO	PSO1	PSO2	PSO3

CH010710

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010710	Project	0-0-4:0	2010

COURSE END SURVEY - CH010710 - Project**CO->PO MAPPING - CH010710 - Project**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010710 - Project

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH010710 - Project

CH010710/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010710 - Project

CH010710/PSO	PSO1	PSO2	PSO3

CH010710

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010710	Project	4-0-0:4	2010

COURSE END SURVEY - CH010710 - Project**CO->PO MAPPING - CH010710 - Project**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010710 - Project

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH010710 - Project

CH010710/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010710 - Project

CH010710/PSO	PSO1	PSO2	PSO3

CH010709

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010709	Seminar	0-0-4:0	2010

COURSE END SURVEY - CH010709 - Seminar**CO->PO MAPPING - CH010709 - Seminar**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - CH010709 - Seminar

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH010709 - Seminar

CH010709/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010709 - Seminar

CH010709/PSO	PSO1	PSO2	PSO3

CH401

Course Code	Course Name	L-T-P:C	Year of Introduction
CH401	Transport Phenomena in Processes	3-1-0:4	2016

No.	Course Outcome - CH401 - Transport Phenomena in Processes	Target
CO1	Analyse the dependence of temperature and pressure on the transport coefficients and derive simple shell balances for momentum transport	53.5%
CO2	Apply the governing equations of momentum transport in solving engineering problems	53.5%
CO3	Derive simple shell balances to formulate conservation equations of heat transport apply them in simple engineering problems.	53.5%
CO4	Apply the governing equations of heat transport in solving engineering problems	53.5%
CO5	Understand the concepts diffusivity and the mechanism of Mass Transport	53.5%
CO6	Develop analogies between the transport processes and apply them in solving engineering problems	53.5%

COURSE END SURVEY - CH401 - Transport Phenomena in Processes

Sl.No	Questions & Options
CO1	To what extent you are able to analyse and derive shell balances for momentum transport
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to apply the governing equations of momentum transport in solving engineering problems
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	How well can you formulate conservation equations of heat transport
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent can you apply the governing equations of heat transport in solving engineering problems
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	How well have you understood the concepts diffusivity and the mechanism of Mass Transport
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO6	To what extent can you develop analogies between the transport processes and apply them in solving engineering problems
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - CH401 - Transport Phenomena in Processes

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1							
CO2	3	3	2	2	1							

CO3	3	3	2	2	1							
CO4	3	3	2	2	1							
CO5	3	2	1	1	1							
CO6	2	2	1	1	1							

CO->PSO MAPPING - CH401 - Transport Phenomena in Processes

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
CO6	3	2	

COURSE->PO MAPPING - CH401 - Transport Phenomena in Processes

CH401/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	1							

COURSE->PSO MAPPING - CH401 - Transport Phenomena in Processes

CH401/PSO	PSO1	PSO2	PSO3
	3	2	

CH403

Course Code	Course Name	L-T-P:C	Year of Introduction
CH403	Process Instrumentation	3-0-0:3	2016

No.	Course Outcome - CH403 - Process Instrumentation	Target
CO1	Explain the physics of pressure, temperature, level and flow measurement	62.5%
CO2	Demonstrate the mechanical and electrical aspects of instruments used to measure temperatures of processes and their range of applicability and characteristics	62.5%
CO3	Recognize the mechanical and electrical aspects of pressure and level measurement devices and their suitability for process-dependent application	62.5%
CO4	Illustrate the principles and working of variety of meters and techniques used for liquid and gas flow measurements.	62.5%
CO5	Identify the techniques used to estimate and analyse moisture contents in solids, liquids and gases	62.5%

CO6	Demonstrate the principles and operations of advanced sophisticated analysis techniques for material composition & characteristics using spectroscopy, chromatography and polarography as well as fundamentals of P& I diagrams	62.5%
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COURSE END SURVEY - CH403 - Process Instrumentation

Sl.No	Questions & Options
CO1	To what extent you are able to explain the physics of pressure, temperature, level and flow measurement? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	How well can you demonstrate mechanical and electrical aspects of instruments used to measure temperatures of processes and their range of applicability and characteristics? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	How well do you recognize the mechanical and electrical aspects of pressure and level measurement devices and their suitability for process-dependent applications? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent can you illustrate the principles and working of meters and techniques used for liquid and gas flow measurement? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	How well can you identify the techniques used to estimate and analyse moisture content in solids, liquids and gases? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	How well can you demonstrate the principle and operations of advanced sophisticated analysis of material composition & characteristics using spectroscopy, chromatography and polarography, as well as fundamentals of P& I diagrams? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH403 - Process Instrumentation

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2	3		1		1							
CO3	3		1		1							
CO4	3		1		1							
CO5	3		1		1							
CO6	3	1	1		2							

CO->PSO MAPPING - CH403 - Process Instrumentation

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	

CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	2	2	
CO6	3	2	

COURSE->PO MAPPING - CH403 - Process Instrumentation

CH403/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	1		2							

COURSE->PSO MAPPING - CH403 - Process Instrumentation

CH403/PSO	PSO1	PSO2	PSO3
	3	2	

CH405

Course Code	Course Name	L-T-P:C	Year of Introduction
CH405	Chemical Engineering Design - II	3-0-0:3	2016

No.	Course Outcome - CH405 - Chemical Engineering Design - II	Target
CO1	Select and design single and multiple effect evaporators used in industries	62%
CO2	Design cooling towers for process industries	62%
CO3	Select and design suitable drying equipment for process and allied industries	62%
CO4	Design absorption and stripping columns for process industries	62%
CO5	Select and design distillation columns for refinery and other process industries	62%
CO6	Design suitable extraction columns for industrial application	62%

COURSE END SURVEY - CH405 - Chemical Engineering Design - II

Sl.No	Questions & Options
CO1	To what extend you are able to select and design single and multiple effect evaporators used in industries
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extend you are able to design cooling towers for process industries
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extend you are able to select and design suitable drying equipment for process and allied industries

	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extend you are able to select and design distillation columns for refinery and other process industries
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extend you are able to design absorption and stripping columns for process industries
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	To what extend you are able to design suitable extraction columns for industrial application
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CH405 - Chemical Engineering Design - II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	1	1							
CO2	3	2	3	1	1							
CO3	3	2	3	1	1							
CO4	3	2	3	1	1							
CO5	3	2	3	1	1							
CO6	3	2	3	1	1							

CO->PSO MAPPING - CH405 - Chemical Engineering Design - II

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
CO6	3	2	

COURSE->PO MAPPING - CH405 - Chemical Engineering Design - II

CH405/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	1	1							

COURSE->PSO MAPPING - CH405 - Chemical Engineering Design - II

CH405/PSO	PSO1	PSO2	PSO3
	3	2	

CH409

Course Code	Course Name	L-T-P:C	Year of Introduction
CH409	Organic Chemical Technology	3-0-0:3	2016

No.	Course Outcome - CH409 - Organic Chemical Technology	Target
CO1	Demonstrate the manufacturing processes in food industry	68%
CO2	Apply the concepts of unit processes in the manufacture of sugars, starches and related products	68%
CO3	Explain the conversion of raw materials into useful organic products like soaps and detergents	68%
CO4	Illustrate the manufacturing process of various organic chemicals	68%
CO5	Identify the process parameters for the manufacture of various synthetic organic chemicals.	68%
CO6	Demonstrate the manufacturing processes and properties of organic chemicals like dyes, intermediates, pesticides, pharmaceuticals etc.	68%

COURSE END SURVEY - CH409 - Organic Chemical Technology

Sl.No	Questions & Options
CO1	How far have you understood the basic processing industries?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent have you understood the sugar manufacturing and related products?
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO3	How far have you understood the process production of soap,detergent production?
	Answer Choice- <i>Most acceptable/Moderately Acceptable Acceptable/Less acceptable/Not acceptable</i>
CO4	To what extent have you understood the preparation of various organic chemicals?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	How far have you understood the preparation of dyes ,organic chemicals and intermediates?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO6	To what extend have you understood the outline the manufacturing process and properties of organic chemicals like dyes,intermediates etc?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH409 - Organic Chemical Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2	3	2	2	1								
CO3	3		1									

CO4	3		1									
CO5	3		1									
CO6	3		1									

CO->PSO MAPPING - CH409 - Organic Chemical Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	
CO6	3	1	

COURSE->PO MAPPING - CH409 - Organic Chemical Technology

CH409/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	1								

COURSE->PSO MAPPING - CH409 - Organic Chemical Technology

CH409/PSO	PSO1	PSO2	PSO3
	3	1	

CH461

Course Code	Course Name	L-T-P:C	Year of Introduction
CH461	Petroleum Refinery Engineering	3-0-0:3	2016

No.	Course Outcome - CH461 - Petroleum Refinery Engineering	Target
CO1	List different sources of Petroleum.	66%
CO2	Recognize primary processing techniques of crude oil	65.7%
CO3	Categories appropriate cracking methods required for different crude oil.	65.7%
CO4	Choose a required catalytic cracking technique for a given crude.	65.7%
CO5	Outline various products and its production process in petroleum industries.	65.7%
CO6	Characterize products from petroleum industry.	65.7%

COURSE END SURVEY - CH461 - Petroleum Refinery Engineering

Sl.No	Questions & Options
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CO1	To what extend you will be able to list different sources of petroleum?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Will you able to recognize primary processing techniques of crude oil?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	Would you be able to categories appropriate cracking methods required for different crude oil?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How effective are you in choosing a required catalytic cracking technique for a given crude oil?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extend you will be able categories products and its production process in petroleum industries?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	To what extend can you apply the characterization methods for products from petroleum industry?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CH461 - Petroleum Refinery Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2						1					
CO2	2											
CO3	2											
CO4	2	1	1	1			1					
CO5	3											
CO6	2	1	1									

CO->PSO MAPPING - CH461 - Petroleum Refinery Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	1		
CO2	2	1	
CO3	2	1	
CO4	3	2	
CO5	1		
CO6	1	1	

COURSE->PO MAPPING - CH461 - Petroleum Refinery Engineering

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CH461/PO	3	1	1	1			1					
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COURSE->PSO MAPPING - CH461 - Petroleum Refinery Engineering

CH461/PSO	PSO1	PSO2	PSO3
	3	2	

CH471

Course Code	Course Name	L-T-P:C	Year of Introduction
CH471	Solid Waste Management	3-0-0:3	2016

No.	Course Outcome - CH471 - Solid Waste Management	Target
CO1	Analyze solid waste management systems with respect to its physical, chemical and biological properties.	67%
CO2	Identify changing nature of solid wastes and the factors affecting the solid waste generation rates.	67%
CO3	Select appropriate method for solid waste collection and transportation.	67%
CO4	Select appropriate method for solid waste disposal.	67%
CO5	Design solid waste management systems.	67%
CO6	Analyze the material, energy recovery operations and hazardous solid waste management.	67%

COURSE END SURVEY - CH471 - Solid Waste Management

Sl.No	Questions & Options
CO1	What is your ability to analyze solid waste management systems with respect to its physical, chemical and biological properties.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to identify changing nature of solid wastes and the factors affecting the solid waste generation rates.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	What is your level of ability to select appropriate method for solid waste collection and transportation.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	What is your level of ability to select appropriate method for solid waste disposal.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	What is level of knowledge in the design solid waste management systems.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO6	What is your ability to analyze the material, energy recovery operations and hazardous solid waste management.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH471 - Solid Waste Management

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1		1		3	3	1			2	1
CO2	2	1		1		2	2	1			1	1
CO3	2	2	1	1		2	2	1			1	1
CO4	3	2	2	1		3	3	1	1	1	1	1
CO5	3	3	3	2		3	3	1	1	1	1	1
CO6	2	2	2	2		2	2	1	1	1	1	1

CO->PSO MAPPING - CH471 - Solid Waste Management

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	2	1	1
CO3	2	1	
CO4	3	1	1
CO5	3	2	1
CO6	3	1	1

COURSE->PO MAPPING - CH471 - Solid Waste Management

CH471/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2		3	3	1	1	1	2	1

COURSE->PSO MAPPING - CH471 - Solid Waste Management

CH471/PSO	PSO1	PSO2	PSO3
	3	2	1

CH431

Course Code	Course Name	L-T-P:C	Year of Introduction
CH431	Process Control Lab	0-0-3:1	2016

No.	Course Outcome - CH431 - Process Control Lab	Target
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CO1	Determine the dynamics and dynamic parameters of liquid level systems	62.2%
CO2	Determine the dynamics and dynamic parameters of temperature measuring devices like thermometer	62.1%
CO3	Demonstrate the step response of a second order system	62.1%
CO4	Demonstrate different types of control mechanisms	62.1%
CO5	Determine the characteristics of control valves	62.1%
CO6	Demonstrate the application of software tools for process control	62.1%

COURSE END SURVEY - CH431 - Process Control Lab

Sl.No	Questions & Options
CO1	To what extent you are able to determine the dynamics and dynamic parameters of liquid level systems?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How proficient are you in the dynamics and dynamic parameters of temperature measuring devices like thermometer?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to demonstrate the step response of a second order system?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	How far you are able to demonstrate different types of control mechanisms?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	To what extent you can determine the characteristics of control valves
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent are you able to demonstrate the application of software tools for process control?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH431 - Process Control Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	3			1	2	2		1
CO2	3	3	2	3	3			1	2	2		1
CO3	3	2	2	1	1				2	2		1
CO4	3	2	2	1	1				2	2		1
CO5	3	2	2	1	1				2	2		1
CO6	2	2	2	2	3				2	2		1

CO->PSO MAPPING - CH431 - Process Control Lab

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	3	2	1
CO3	3	2	1
CO4	3	2	1
CO5	3	2	1
CO6	3	2	1

COURSE->PO MAPPING - CH431 - Process Control Lab

CH431/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	3	3			1	2	2		1

COURSE->PSO MAPPING - CH431 - Process Control Lab

CH431/PSO	PSO1	PSO2	PSO3
	3	2	1

CH451

Course Code	Course Name	L-T-P:C	Year of Introduction
CH451	Seminar & Project Preliminary	0-1-4:2	2016

No.	Course Outcome - CH451 - Seminar & Project Preliminary	Target
CO1	Develop presentation skills and provide transfer of knowledge effectively to an audience	70%
CO2	Analyze scientific literature for assimilating knowledge	70%
CO3	Write technical documents and give oral presentations	70%
CO4	Describe acquired information using a variety of modern presentation tools	70%
CO5	Identify a current engineering problem of professional interest, analyze it and propose a preliminary work plan to solve it.	70%

COURSE END SURVEY - CH451 - Seminar & Project Preliminary

Sl.No	Questions & Options
CO1	To what extent have you developed presentation skills and provide transfer of knowledge effectively to an audience
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent can you analyze scientific literature for assimilating knowledge

	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well are you able to write technical documents and give oral presentations
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How well can you describe acquired information using a variety of modern presentation tools
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	How well are you able to identify a current engineering problem of professional interest, analyze it and propose a preliminary work plan to solve it.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH451 - Seminar & Project Preliminary

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									3	3		1
CO2	1	2		1	1				3	3		1
CO3									2	3		1
CO4					3				2	3		1
CO5	3	2	2	1	2	1	1	1	2	2	2	1

CO->PSO MAPPING - CH451 - Seminar & Project Preliminary

CO/PSO	PSO1	PSO2	PSO3
CO1			3
CO2	2	2	2
CO3			3
CO4			2
CO5	2	2	2

COURSE->PO MAPPING - CH451 - Seminar & Project Preliminary

CH451/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	1	3	1	1	1	3	3	2	1

COURSE->PSO MAPPING - CH451 - Seminar & Project Preliminary

CH451/PSO	PSO1	PSO2	PSO3
	2	2	3

CH407

Course Code	Course Name	L-T-P:C	Year of Introduction
CH407	BIOCHEMICAL ENGINEERING	3-0-0:3	2016

No.	Course Outcome - CH407 - BIOCHEMICAL ENGINEERING	Target
CO1	Become familiar with types of cells, their structure and composition.	72%
CO2	Understand what enzymes are, how they are classified, what their function is, and the mechanistic models describing their function in enzymatic reactions.	72%
CO3	Compare methods for production, purification, characterization and immobilization of enzymes	72%
CO4	Grasp the mechanisms and energetics of metabolic pathways in the cell	72%
CO5	Measure and classify stages of microbial growth and understand fermentation schemes	72%
CO6	Apply the basic concepts of mass and heat transfer in reactor design for biochemical processes	72%

COURSE END SURVEY - CH407 - BIOCHEMICAL ENGINEERING

Sl.No	Questions & Options
CO1	Did you get the basic biology for understanding biochemical process systems
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO2	What is the level of your understanding on enzyme classes, functions and enzymatic reactions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	Will you be able to characterize, purify and immobilize an enzyme
	Answer Choice- <i>Very frequently/Frequently/Rarely Very rarely/Never</i>
CO4	Did the study of various metabolic pathways in cell help your understanding of a biological process
	Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO5	What is the level of your knowledge on microbial growth and fermentation schemes
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	What is your understanding about applying unit operations to a bioprocess
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH407 - BIOCHEMICAL ENGINEERING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					1						
CO2	3	1	1	1	1							
CO3	3				2							
CO4	3	1		1	1							

CO5	3	1	1	1	1							
CO6	3	2	3	1	2							

CO->PSO MAPPING - CH407 - BIOCHEMICAL ENGINEERING

CO/PSO	PSO1	PSO2	PSO3
CO1	1		
CO2	1	1	
CO3	2	1	
CO4	2	2	
CO5	2	2	
CO6	3	2	

COURSE->PO MAPPING - CH407 - BIOCHEMICAL ENGINEERING

CH407/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	1	2	1						

COURSE->PSO MAPPING - CH407 - BIOCHEMICAL ENGINEERING

CH407/PSO	PSO1	PSO2	PSO3
	3	2	

CH467

Course Code	Course Name	L-T-P:C	Year of Introduction
CH467	Process Modelling and Simulation	3-0-0:3	2016

No.	Course Outcome - CH467 - Process Modelling and Simulation	Target
CO1	Explain basic concepts in modelling and simulation and identify appropriate models.	70%
CO2	Derive basic equations in momentum heat and mass transfer.	70%
CO3	Develop mathematical models for chemical engineering systems.	70%
CO4	Identify the variations in process parameters for unit operations like distillation and boiling.	70%
CO5	Design mathematical models for distributed systems such as jacketed vessels.	70%
CO6	Apply suitable numerical simulation methods for the solution of models.	70%

COURSE END SURVEY - CH467 - Process Modelling and Simulation

Sl.No	Questions & Options
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CO1	How far you are able to explain basic concepts in modelling and simulation and identify appropriate models?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	How far you are able to derive basic equations in momentum heat and mass transfer?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent you can develop mathematical models for chemical engineering systems?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How far you are able to identify variations in process parameters for unit operations like distillation and boiling?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent can you design mathematical models for distributed systems such as jacketed vessels?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	How far you are able to apply suitable numerical simulation methods for the solution of models?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - CH467 - Process Modelling and Simulation

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2							
CO2	3	2	2	1								
CO3	3	3	2	1	1							
CO4	2	2	2	1	1							
CO5	2	2	2	1	1							
CO6	2	2	2	1	3							

CO->PSO MAPPING - CH467 - Process Modelling and Simulation

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	2	2	
CO4	2	2	
CO5	1	1	
CO6	2	2	

COURSE->PO MAPPING - CH467 - Process Modelling and Simulation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CH467/PO	3	3	2	1	3							
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COURSE->PSO MAPPING - CH467 - Process Modelling and Simulation

CH467/PSO	PSO1	PSO2	PSO3
	3	2	

CH463

Course Code	Course Name	L-T-P:C	Year of Introduction
CH463	Enzyme Engineering	3-0-0:3	2016

COURSE END SURVEY - CH463 - Enzyme Engineering**CO->PO MAPPING - CH463 - Enzyme Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH463 - Enzyme Engineering

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH463 - Enzyme Engineering

CH463/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH463 - Enzyme Engineering

CH463/PSO	PSO1	PSO2	PSO3

SEMESTER-8**CH010802**

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010802	Nano Technology	0-0-0:0	2014

No.	Course Outcome - CH010802 - Nano Technology	Target
CO1	Explain the important characteristics of nanostructured materials	60%
CO2	Identify different instruments for characterization of nanomaterials	60%
CO3	Identify the various techniques for synthesis of nanomaterials	60%
CO4	Outline various manufacturing techniques of nanoscale manipulation	60%
CO5	Analyze the various applications of nanomaterials and develop novel applications	60%

COURSE END SURVEY - CH010802 - Nano Technology

Sl.No	Questions & Options
CO1	How well can you explain the important characteristics of nanostructured materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How well can you Identify different instruments for characterization of nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well can you Identify the various techniques for synthesis of nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How well can you outline various manufacturing techniques of nanoscale manipulation
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	How well can you analyze the various applications of nanomaterials and develop novel applications
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH010802 - Nano Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		1								1
CO2	1	1		3								1
CO3	2	1		2								3
CO4	1	1		2								2
CO5	3	2	2									1

CO->PSO MAPPING - CH010802 - Nano Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	
CO2	1	1	
CO3		1	
CO4		1	
CO5	1	1	

COURSE->PO MAPPING - CH010802 - Nano Technology

CH010802/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	3								3

COURSE->PSO MAPPING - CH010802 - Nano Technology

	PSO1	PSO2	PSO3

CH010802/PSO	3	3	
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CH010803

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010803	Chemical Process Optimization	0-0-0:0	2014

No.	Course Outcome - CH010803 - Chemical Process Optimization	Target
CO1	Apply optimization techniques to formulate and solve practical problems	60%
CO2	Apply different numerical methods for optimization of single variable unconstrained functions	60%
CO3	Solve unconstrained multivariable optimization problems	60%
CO4	Solve linear programming and nonlinear programming problems with constraints using various methods	60%
CO5	Analyze typical applications of optimization techniques in chemical process industries	60%

COURSE END SURVEY - CH010803 - Chemical Process Optimization

Sl.No	Questions & Options
CO1	To what extent you are able to apply optimization techniques to formulate and solve practical problems?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you are able to apply different numerical methods for optimization of single variable unconstrained functions?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to solve unconstrained multivariable optimization problems?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to solve linear programming problems using various methods?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to analyze typical optimization issues in chemical process industries?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH010803 - Chemical Process Optimization

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2					1	1	1
CO2	3	3	2	2	2					1	1	1
CO3	3	3	1	2	2					1	1	1

CO4	3	3	2	2	2					1	1	1
CO5	3	3	1	2	2					1	1	1

CO->PSO MAPPING - CH010803 - Chemical Process Optimization

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	1	
CO3	3	1	
CO4	3	1	
CO5	3	1	

COURSE->PO MAPPING - CH010803 - Chemical Process Optimization

CH010803/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	2	2					1	1	1

COURSE->PSO MAPPING - CH010803 - Chemical Process Optimization

CH010803/PSO	PSO1	PSO2	PSO3
	3	1	

CH010801

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010801	Chemical Engineering Design and Drawing II	0-0-0:0	2014

No.	Course Outcome - CH010801 - Chemical Engineering Design and Drawing II	Target
CO1	Select and design single and multiple effect evaporators used in industries	60%
CO2	Design cooling towers for process industries	60%
CO3	Select and design distillation columns for refinery and other process industries	60%
CO4	Design absorption and stripping columns for process industries	60%
CO5	Design suitable extraction columns for industrial applications	60%
CO6	Select and design suitable drying equipment for process and allied industries	60%

COURSE END SURVEY - CH010801 - Chemical Engineering Design and Drawing II

Sl.No	Questions & Options
CO1	To what extent you are able to select and design the relevant evaporators for industries
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO2	How would you rate your ability to design a cooling tower for industrial purpose?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO3	To what extent you are able to design distillation columns for process industries?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	To what extent you are able to design absorption and stripping columns for process industries?
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO5	How would you rate your ability to design extractors for industries?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO6	To what extent you are able to design suitable drying equipment for process and allied industries
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - CH010801 - Chemical Engineering Design and Drawing II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	1		1		1	2	2	2
CO2	3	3	3	2	2	1	1	1	1	1	3	3
CO3	3	2	3	3	3	1	1		1	2	2	3
CO4	3	3	2	3	2	1	1			2	2	3
CO5	3	3	3	2	2				1	1	2	2
CO6	3	3	2	2	1	1			1	1	1	1

CO->PSO MAPPING - CH010801 - Chemical Engineering Design and Drawing II

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	
CO2	1	1	
CO3	1	1	1
CO4	1	1	1
CO5	1	1	
CO6	1	1	

COURSE->PO MAPPING - CH010801 - Chemical Engineering Design and Drawing II

CH010801/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	1	1	1	1	2	3	3

COURSE->PSO MAPPING - CH010801 - Chemical Engineering Design and Drawing II

CH010801/PSO	PSO1	PSO2	PSO3
	1	1	1

CH010804L05

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010804L05	Numerical Methods for Chemical Engineers	4-0-0:4	2010

COURSE END SURVEY - CH010804L05 - Numerical Methods for Chemical Engineers**CO->PO MAPPING - CH010804L05 - Numerical Methods for Chemical Engineers**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010804L05 - Numerical Methods for Chemical Engineers

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010804L05 - Numerical Methods for Chemical Engineers

CH010804L05/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010804L05 - Numerical Methods for Chemical Engineers

CH010804L05/PSO	PSO1	PSO2	PSO3

CH010805G04

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010805G04	Safety in Chemical Industries	3-1-0:4	2014

No.	Course Outcome - CH010805G04 - Safety in Chemical Industries	Target
CO1	Explain the basic concepts of industrial safety	65%
CO2	Identify various hazards in a chemical industry.	65%
CO3	Do documentations regarding various safety related works	65%
CO4	Outline the safety practices in industries	65%
CO5	Propose emergency procedures to be adapted to chemical industries	65%

COURSE END SURVEY - CH010805G04 - Safety in Chemical Industries

Sl.No	Questions & Options
CO1	To what extent you are able to explain the basic concepts of industrial safety
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO2	To what extend you can Identify various hazards in a chemical industry
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO3	To what extend can you do documentations regarding various safety related works
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO4	To what extend you can outline the safety practices in industries
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5
CO5	To what extend you can propose emergency procedures to be adapted in chemical industries
	Answer Choice- 5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5

CO->PO MAPPING - CH010805G04 - Safety in Chemical Industries

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	1	1	3	2	2	1	2	2	3
CO2	2	3	3	2	1	3	1	2	2	2	2	2
CO3	2	3	3	1	1	3	2	3	3	3	3	1
CO4	3	2	2	3	1	3	2	2	2	3	2	2
CO5	3	2	3	2	2	3	2	2	2	2	3	2

CO->PSO MAPPING - CH010805G04 - Safety in Chemical Industries

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3
CO5	3	3	3

COURSE->PO MAPPING - CH010805G04 - Safety in Chemical Industries

CH010805G04/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2	3	2	3	3	3	3	3

COURSE->PSO MAPPING - CH010805G04 - Safety in Chemical Industries

CH010805G04/PSO	PSO1	PSO2	PSO3
	3	3	3

CH010805G01

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010805G01	Project Engineering	4-0-0:4	2010

COURSE END SURVEY - CH010805G01 - Project Engineering**CO->PO MAPPING - CH010805G01 - Project Engineering**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH010805G01 - Project Engineering

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH010805G01 - Project Engineering

CH010805G01/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH010805G01 - Project Engineering

CH010805G01/PSO	PSO1	PSO2	PSO3

CH010807

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010807	Project	0-0-0:0	2014

No.	Course Outcome - CH010807 - Project	Target
CO1	Apply the relevant knowledge and skills, which are acquired within the technical area to solve a given problem	60%
CO2	Analyse the problem scientifically and arrive at workable solutions	60%
CO3	Think innovatively and develop relevant components, products, processes or technologies	60%
CO4	Organize and execute work in a team	60%
CO5	Document and present ones own work for a given target group, with strict requirements on structure and format	60%
CO6	Identify the need to further enhance knowledge and lifelong learning	60%

COURSE END SURVEY - CH010807 - Project

Sl.No	Questions & Options
CO1	<p>To what extent you are able to apply the relevant knowledge and skills, which are acquired within the technical area to solve a given problem</p> <p>Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i></p>

CO2	To what extent you are able to analyse the problem scientifically and arrive at workable solutions	To what extent are you able to identify the need to further enhance knowledge and lifelong learning
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>	
CO3	To what extent you are able to think innovatively and develop relevant components, products, processes or technologies	
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>	
CO4	To what extent you are able to organize and execute work in a team	
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>	
CO5	CO6	
Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>		

CO->PO MAPPING - CH010807 - Project

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1							
CO2	3	3	3	3	1							
CO3	2	2	3	3	2							
CO4							1	2	3	3	1	3
CO5				2	2					3	1	1
CO6								2			3	

CO->PSO MAPPING - CH010807 - Project

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			

CO4			
CO5			
CO6			

COURSE->PO MAPPING - CH010807 - Project

CH010807/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2		1	2	3	3	3	3

COURSE->PSO MAPPING - CH010807 - Project

CH010807/PSO	PSO1	PSO2	PSO3

CH010804L02

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010804L02	Water and Waste water Engineering	0-0-0:0	2014

No.	Course Outcome - CH010804L02 - Water and Waste water Engineering	Target
CO1	Explain the important characteristics, analysis techniques and standards for water and wastewater	60%
CO2	Identify different treatment systems and plants for water and wastewater	60%
CO3	Identify the various techniques for waste water treatment based on the nature of pollutants	60%
CO4	Design systems for industrial waste water treatment	60%
CO5	Analyze the operation, trouble shooting and maintenance of treatment plant operations	60%

COURSE END SURVEY - CH010804L02 - Water and Waste water Engineering

Sl.No	Questions & Options
CO1	How well can you Explain the important characteristics, analysis techniques and standards for water and wastewater
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How well can you identify different treatment systems and plants for water and wastewater
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well can you identify the various techniques for waste water treatment based on the nature of pollutants
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How well can you design systems for industrial waste water treatment
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO5	How well can you analyze the operation, trouble shooting and maintenance of treatment plant operations
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - CH010804L02 - Water and Waste water Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	3	3			1		2			
CO2	1	1	3	1			1		2			
CO3	1	1	3	1			1		3			
CO4	2	2	3	1			1		3			
CO5	2	3	3	1		1	2		2			

CO->PSO MAPPING - CH010804L02 - Water and Waste water Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	1	2	1
CO2	1	1	
CO3	1	1	
CO4	3	1	
CO5	1	1	

COURSE->PO MAPPING - CH010804L02 - Water and Waste water Engineering

CH010804L02/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	3	3		1	2		3			

COURSE->PSO MAPPING - CH010804L02 - Water and Waste water Engineering

CH010804L02/PSO	PSO1	PSO2	PSO3
	3	2	1

CH010806

Course Code	Course Name	L-T-P:C	Year of Introduction
CH010806	Chemical Reaction Engineering and Process Control Lab	0-0-0:0	2014

No.	Course Outcome - CH010806 - Chemical Reaction Engineering and Process Control Lab	Target
CO1	Analyze experimental data to obtain the reaction rate law expressions	65%
CO2	Determine the kinetics of chemical reactions using steady state reactors	65%
CO3	Design experiments to acquire the data pertaining to kinetics and residence time distribution	65%

CO4	Analyze the characteristics of control valves	65%
CO5	Determine the step response of first and second order systems	65%

COURSE END SURVEY - CH010806 - Chemical Reaction Engineering and Process Control Lab

Sl.No	Questions & Options
CO1	What is your ability in the determination of rate law expressions
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	What is your knowledge in kinetics determination using steady state reactors
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	Rate your ability in determining the kinetics and residence time distribution
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO4	What is your ability in analyzing the characteristics of control valve
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	What is your level of ability in the determination of step response of first and second order systems
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH010806 - Chemical Reaction Engineering and Process Control Lab

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1				2	1		
CO2	3	3	2	2	1				2	1		
CO3	3	3	2	1	1				2	1		
CO4	3	3	2	1	1				2	1		
CO5	3	3	2	1	1				2	1		

CO->PSO MAPPING - CH010806 - Chemical Reaction Engineering and Process Control Lab

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - CH010806 - Chemical Reaction Engineering and Process Control Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CH010806/PO	3	3	2	2	1				2	1		
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COURSE->PSO MAPPING - CH010806 - Chemical Reaction Engineering and Process Control Lab

CH010806/PSO	PSO1	PSO2	PSO3

CH468

Course Code	Course Name	L-T-P:C	Year of Introduction
CH468	Food Processing and Technology	3-0-0:3	2016

No.	Course Outcome - CH468 - Food Processing and Technology	Target
CO1	Understand the general aspects of Global and Indian food industry and classify food constituents, additives and their deteriorative factors.	61%
CO2	Analyze food conversion operations and food quality control.	61%
CO3	Categorize various food preservation methods such as hot and cold, irradiation, microwave, fermentation and pickling.	61%
CO4	Describe the production and processing of cereals, pulses, vegetables, spices, fats and oils.	61%
CO5	Analyze processing methods in dairy, meat, poultry and fish industry.	61%
CO6	Classify beverage industry and understand the treatment and disposal of food processing wastes.	61%

COURSE END SURVEY - CH468 - Food Processing and Technology

Sl.No	Questions & Options
CO1	To what extent were you able to understand general aspects of Global and Indian food industry and classification of food constituents, additives and their deteriorative factors?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How far were you able to analyze food conversion operations and food quality control?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent were you able to categorize various food preservation methods such as hot & cold, irradiation, microwave, fermentation and pickling?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How far were you able to describe the production and processing of cereals, pulses, vegetables, spices, fats and oils?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	How far were you able to analyze the processing methods in dairy, meat, poultry and fish industry?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO6	To what extent were you able to classify beverage industry and understand the treatment and disposal of food processing wastes?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH468 - Food Processing and Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2						1					
CO2	3	1		1								
CO3	3	1	1									
CO4	3	1	1									
CO5	3	1	1									
CO6	3	1	1			1	2	1				

CO->PSO MAPPING - CH468 - Food Processing and Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	1		
CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	
CO6	2	1	1

COURSE->PO MAPPING - CH468 - Food Processing and Technology

CH468/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	1	1		1	2	1				

COURSE->PSO MAPPING - CH468 - Food Processing and Technology

CH468/PSO	PSO1	PSO2	PSO3
	2	1	1

CH492

Course Code	Course Name	L-T-P:C	Year of Introduction
CH492	Project	0-0-9:6	2016

No.	Course Outcome - CH492 - Project	Target
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CO1	demonstrate proficiency in collecting and processing real-world data, in designing the best methods to solve the problem, in implementing a solution, and quantifying the robustness and accuracy of their model	68%
CO2	demonstrate competence in presenting material by delivering two presentations: a proposal on how to approach the problem and their final solution	68%
CO3	learn how to work in small teams with at least one other student on their project	68%
CO4	will write a report on their project for evaluation by the instructor(s) in consultation with the project advisors	68%
CO5	to apply knowledge of chemical engineering to design or to research on chemical and related processes and to determine his/her proficiency level of the subjects learnt in the entire course	68%

COURSE END SURVEY - CH492 - Project

Sl.No	Questions & Options
CO1	How far you were able to combine the scientific principles and engineering concepts to formulate models of a system or a process that is appropriate in terms of applicability and required accuracy? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you were able to demonstrate the ability to formulate a solution plan and methodology for your project? Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extent were you able to demonstrate the ability to form a team and define a role for each member? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent were you able to create engineering standard figures, reports and drawing to complement writing and presentations Answer Choice- <i>Extremely helpful/Moderately helpful/ Helpful/A little helpful/Not at all helpful</i>
CO5	How far you were able to formulate a solution plan and methodology for an engineering problem by applying the knowledge of Chemical Engineering principles throughout the entire course Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - CH492 - Project

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	1	3	1	1	1	3	1		1
CO2					3	1	1	1	3	3		1
CO3					3	1	1	1	3	3		1
CO4					3	1	1	1	3	3	1	1
CO5	3	2	2	1	3	3	2	3	2	3	2	2

CO->PSO MAPPING - CH492 - Project

CO/PSO	PSO1	PSO2	PSO3
CO1	1	2	3
CO2			3
CO3			3
CO4		1	2
CO5	3	2	3

COURSE->PO MAPPING - CH492 - Project

CH492/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	3	3	2	3	3	3	2	2

COURSE->PSO MAPPING - CH492 - Project

CH492/PSO	PSO1	PSO2	PSO3
	3	2	3

CH466

Course Code	Course Name	L-T-P:C	Year of Introduction
CH466	Composite Materials	3-0-0:3	2016

COURSE END SURVEY - CH466 - Composite Materials**CO->PO MAPPING - CH466 - Composite Materials**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH466 - Composite Materials

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH466 - Composite Materials

CH466/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH466 - Composite Materials

CH466/PSO	PSO1	PSO2	PSO3

CH482

Course Code	Course Name	L-T-P:C	Year of Introduction
CH482	Process utilities and pipe line design	3-0-0:3	2016

No.	Course Outcome - CH482 - Process utilities and pipe line design	Target
CO1	Evaluate flow diagrams and piping installations	60%
CO2	Compare various pumps and valves	60%
CO3	Select water treatment methods for various utilities in industries	60%
CO4	Illustrate steam generation and its applications in chemical processes	60%
CO5	Assess the application of compressors and Vacuum Pumps in process industries	60%
CO6	Describe industrial heating, chilling and nitrogen systems	60%

COURSE END SURVEY - CH482 - Process utilities and pipe line design

Sl.No	Questions & Options
CO1	To what extend you are able to evaluate flow diagrams and piping installation?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend you are able to Compare various pumps and valves
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well are you able to Select water treatment methods for various utilities in industries
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend you are able to Illustrate steam generation and its applications in chemical processes
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend you are able to Assess the application of compressors and Vacuum Pumps in process industries
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend you are able to Describe industrial heating, chilling and nitrogen systems
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH482 - Process utilities and pipe line design

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1		1	1							
CO2	3	1		1	1							
CO3	2	2	1	1	1							
CO4	2	1	1	1	1	1	1					
CO5	3	1		1	1							
CO6	3	2	2	1	1	1	1					

CO->PSO MAPPING - CH482 - Process utilities and pipe line design

CO/PSO	PSO1	PSO2	PSO3
CO1	1		
CO2	3		
CO3	2	1	
CO4	2	1	
CO5	3		
CO6	3	2	

COURSE->PO MAPPING - CH482 - Process utilities and pipe line design

CH482/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	1	1	1	1					

COURSE->PSO MAPPING - CH482 - Process utilities and pipe line design

CH482/PSO	PSO1	PSO2	PSO3
	3	2	

CH404

Course Code	Course Name	L-T-P:C	Year of Introduction
CH404	Safety Engineering of Process Plants	3-0-0:3	2016

No.	Course Outcome - CH404 - Safety Engineering of Process Plants	Target
CO1	Impart the basic concepts of safety in Process Engineering	66%
CO2	Develop an understanding about safety practices in industries and emergency procedures	66%
CO3	Identify and apply managerial principles in the chemical process industries	66%
CO4	Recognize safety standards and professional codes of conduct for engineers by audit and analysis studies	66%
CO5	Apply engineering fundamentals on fire safety by fire extinguisher and fire proofing	66%
CO6	Incorporate inherent safety, awareness about government agencies, regulatory bodies, codes, and standards that govern the global, societal, and environmental impact	66%

COURSE END SURVEY - CH404 - Safety Engineering of Process Plants

Sl.No	Questions & Options
CO1	How well do you understand the basic concepts of safety in Process Engineering
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO2	To what extent you have understood about safety practices in industries and emergency procedures
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent can you identify and apply managerial principles in the chemical process industries
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent can you recognize safety standards and professional codes of conduct
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	How well can you apply engineering fundamentals on fire safety by fire extinguisher and fire proofing
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	How well can you incorporate inherent safety, awareness about government agencies, regulatory bodies, codes, and standards that govern the global, societal, and environmental impact
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH404 - Safety Engineering of Process Plants

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3		3	1	2		1
CO2					1	2		1	1	2		1
CO3					1	2		1	1	2	2	1
CO4					1	3	1	3	1	2	3	1
CO5	2	1			1	1	3	2	1	2		1
CO6					1	3	2	3	1	2	2	1

CO->PSO MAPPING - CH404 - Safety Engineering of Process Plants

CO/PSO	PSO1	PSO2	PSO3
CO1			2
CO2			3
CO3			3
CO4			2
CO5	2	1	1
CO6			3

COURSE->PO MAPPING - CH404 - Safety Engineering of Process Plants

CH404/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	1			1	3	3	3	1	2	3	1

COURSE->PSO MAPPING - CH404 - Safety Engineering of Process Plants

CH404/PSO	PSO1	PSO2	PSO3
	2	1	3

CH402

Course Code	Course Name	L-T-P:C	Year of Introduction
CH402	Project Engineering and Process Plant Economics	3-0-0:3	2016

No.	Course Outcome - CH402 - Project Engineering and Process Plant Economics	Target
CO1	Explain scope and role of a project Engineer and classify projects	61.5%
CO2	Define planning and scheduling of projects and study the different office procedures related to projects	61.5%
CO3	elaborate the scope and different standards used in piping design	61.5%
CO4	explain different tools in the plant economic studies and to determine the depreciation techniques	61.5%
CO5	Explain different types of cost indices and comparison techniques used	61.5%
CO6	elaborate the different mathematical methods used for profitability evaluation and explain the variable cost and fixed cost related to plant economics	61.5%

COURSE END SURVEY - CH402 - Project Engineering and Process Plant Economics

Sl.No	Questions & Options
CO1	How far you are able to explain the role of a project engineer and to classify projects?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	how far are you able to answer the office procedures relating to project?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	how far are you able to explain the scope piping engineering
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	to what extent are you able to understand depreciation and plant economics?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	how far are you able to explain the cost indices methods and principles of accounting
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	how far are you able to explain profitability analysis , variable and fixed cost analysis
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - CH402 - Project Engineering and Process Plant Economics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				1		3				1	3	
CO2					2				2		3	
CO3	1		1		1							
CO4			1		2	3					3	
CO5					2						3	
CO6					2						3	

CO->PSO MAPPING - CH402 - Project Engineering and Process Plant Economics

CO/PSO	PSO1	PSO2	PSO3
CO1			1
CO2			1
CO3	2	1	1
CO4		1	2
CO5		1	2
CO6		1	2

COURSE->PO MAPPING - CH402 - Project Engineering and Process Plant Economics

CH402/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1		1	1	2	3			2	1	3	

COURSE->PSO MAPPING - CH402 - Project Engineering and Process Plant Economics

CH402/PSO	PSO1	PSO2	PSO3
	2	1	2

CH464

Course Code	Course Name	L-T-P:C	Year of Introduction
CH464	Water and Waste water Engineering	3-0-0:3	2016

No.	Course Outcome - CH464 - Water and Waste water Engineering	Target
CO1	Analyze the physical, chemical as well as biological characteristics of water.	60.5%
CO2	Interpret water quality data to assess its sustainable use in potable or recycled water supply systems.	60.5%
CO3	Analyze the wastewater flow, characteristics and treatment component.	60.5%

CO4	Select appropriate treatment schemes to remove the pollutants present in water or wastewater.	60.5%
CO5	Investigate the sludge treatment and its disposal.	60.5%
CO6	Analyze the treatment schemes for different industries.	60.5%

COURSE END SURVEY - CH464 - Water and Waste water Engineering

Sl.No	Questions & Options
CO1	To what extent you are able to analyze the physical, chemical as well as biological characteristics of water.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	What is your ability to interpret water quality data to assess its sustainable use in potable or recycled water supply systems.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you are able to analyze the wastewater flow, characteristics and treatment component.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you are able to select appropriate treatment schemes to remove the pollutants present in water or wastewater.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent you are able to investigate the sludge treatment and its disposal.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent you are able to analyze the treatment schemes for different industries.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - CH464 - Water and Waste water Engineering

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1		1								
CO2	2	2	2	1		1	1			1		
CO3	3	1		1		1		1				
CO4	3	3	2	1	1	1	1	1	1	1	1	1
CO5	2	1	1	1		2	2	1	1	1	1	1
CO6	2	1	1	1		1	1	1		1	1	1

CO->PSO MAPPING - CH464 - Water and Waste water Engineering

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	1
CO2	2	1	1

CO3	2	1	
CO4	3	2	1
CO5	2	1	1
CO6	1	1	

COURSE->PO MAPPING - CH464 - Water and Waste water Engineering

CH464/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	2	1	1	2	2	1	1	1	1	1

COURSE->PSO MAPPING - CH464 - Water and Waste water Engineering

CH464/PSO	PSO1	PSO2	PSO3
	3	2	1

CH484

Course Code	Course Name	L-T-P:C	Year of Introduction
CH484	Fuel cell technology	3-0-0:3	2016

COURSE END SURVEY - CH484 - Fuel cell technology**CO->PO MAPPING - CH484 - Fuel cell technology**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH484 - Fuel cell technology

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - CH484 - Fuel cell technology

CH484/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH484 - Fuel cell technology

CH484/PSO	PSO1	PSO2	PSO3

CH472

Course Code	Course Name	L-T-P:C	Year of Introduction
CH472	Process Integration	3-0-0:3	2016

COURSE END SURVEY - CH472 - Process Integration**CO->PO MAPPING - CH472 - Process Integration**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - CH472 - Process Integration

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - CH472 - Process Integration

CH472/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - CH472 - Process Integration

CH472/PSO	PSO1	PSO2	PSO3

M.Tech-Nano Technology**SEMESTER-1****MNT107**

Course Code	Course Name	L-T-P:C	Year of Introduction
MNT107	Seminar	0-0-4:4	2010

COURSE END SURVEY - MNT107 - Seminar**CO->PO MAPPING - MNT107 - Seminar**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO->PSO MAPPING - MNT107 - Seminar

CO/PSO	PSO1	PSO2	PSO3

COURSE->PO MAPPING - MNT107 - Seminar

MNT107/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - MNT107 - Seminar

MNT107/PSO	PSO1	PSO2	PSO3

04CH6103

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6103	Introduction to Nanotechnology	3-1-0:4	2016

No.	Course Outcome - 04CH6103 - Introduction to Nanotechnology	Target
CO1	Describe the history of nanotechnology and illustrate fundamental concepts of confinement and nanosynthesis	55%
CO2	Explain the concepts of tunneling, inter-molecular forces, various structures and surface phenomenons in nanoscale.	55%

CO3	Explain Moore's laws and various nano-fabrication techniques	55%
CO4	Compare various lithographic techniques for manufacturing nanoscale structures	55%
CO5	Describe the physical methods and chemical methods for synthesis of nanomaterials.	55%
CO6	Describe the physical methods for synthesis of nano materials	55%

COURSE END SURVEY - 04CH6103 - Introduction to Nanotechnology

Sl.No	Questions & Options	
CO1	To what extend you are able to Describe the history of nanotechnology and illustrate fundamental concepts of confinement and nanosynthesis	
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>	
CO2	To what extend you are able to Explain the concepts of tunneling, inter-molecular forces, various structures and surface phenomenons in nanoscale.	
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>	
CO3	CO4	To what extend you are able to Compare various lithographic techniques for manufacturing nanoscale structures
Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>		
CO5	To what extend you are able to Describe the chemical methods for synthesis of nanomaterials.	
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>	
CO6	To what extend you are able to Describe the physical methods for synthesis of nano materials	
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>	

CO->PO MAPPING - 04CH6103 - Introduction to Nanotechnology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1			2							1
CO2	1	1	1	1	2	1						
CO3	1	1				1			1			1

CO4	1	2		1	2	1						
CO5	1	3			2							1
CO6	1	3			2							1

CO->PSO MAPPING - 04CH6103 - Introduction to Nanotechnology

CO/PSO	PSO1	PSO2	PSO3
CO1	1		1
CO2	1	1	
CO3	1	1	
CO4	2	1	
CO5	3	2	
CO6	3	2	

COURSE->PO MAPPING - 04CH6103 - Introduction to Nanotechnology

04CH6103/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	1	1	2	1			1			1

COURSE->PSO MAPPING - 04CH6103 - Introduction to Nanotechnology

04CH6103/PSO	PSO1	PSO2	PSO3
	3	2	1

04CH6107

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6107	Engineering Principles for Nanotechnology	3-0-0:4	2016

No.	Course Outcome - 04CH6107 - Engineering Principles for Nanotechnology	Target
CO1	To acquaint with fundamental aspects of advanced vacuum technology and its applications in nano-forming	61%
CO2	To demonstrate the role of vaporization in microminiaturization of silicon circuits	61%
CO3	To understand the fundamentals of semiconductor functioning in order to further nano-scale transistor integration	61%
CO4	To evaluate the various nano-lithographic techniques for appropriate nano-fabrication needs	61%
CO5	To understand the change in material characteristics and behaviour when made into thin films, corresponding evolution of Micro-Electro-Mechanical Systems	61%

CO6	To demonstrate the applications of Nanoelectromechanical systems (NEMS) devices in various fields like molecular electronics, micro-fluidics, etc.	61%
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COURSE END SURVEY - 04CH6107 - Engineering Principles for Nanotechnology

Sl.No	Questions & Options
CO1	How well are you acquainted with fundamental aspects of advanced vacuum technology and its applications in nano-forming?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	How well can you demonstrate the role of vaporization in microminiaturization of silicon circuits?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	How well do you understand the fundamentals of semiconductor functioning in order to further nano-scale transistor integration?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent can you evaluate the various nano-lithographic techniques for appropriate nano-fabrication needs.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	How well do you understand the change in material characteristics and behaviour when made into thin films, corresponding evolution of Micro-Electro-Mechanical Systems?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent can you demonstrate the applications of Nanoelectromechanical systems (NEMS) devices in various fields like molecular electronics, micro-fluidics, etc.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - 04CH6107 - Engineering Principles for Nanotechnology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3	3	2	2	2	2	2	1
CO2	3	3	2	1	3	3	2	1	2	2	1	2
CO3	3	3	2	2	2	3	2	1	2	2	1	3
CO4	3	3	3	3	3	3	2	1	2	2	1	2
CO5	3	3	3	3	2	3	3	1	3	2	1	2
CO6	3	3	3	3	3	3	3	2	2	2	2	3

CO->PSO MAPPING - 04CH6107 - Engineering Principles for Nanotechnology

CO/PSO	PSO1	PSO2	PSO3
CO1	2	3	1
CO2	3	2	1

CO3	3	3	2
CO4	2	3	2
CO5	3	3	1
CO6	3	3	2

COURSE->PO MAPPING - 04CH6107 - Engineering Principles for Nanotechnology

04CH6107/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	3	3	2	3	2	2	3

COURSE->PSO MAPPING - 04CH6107 - Engineering Principles for Nanotechnology

04CH6107/PSO	PSO1	PSO2	PSO3
	3	3	2

04GN6001

Course Code	Course Name	L-T-P:C	Year of Introduction
04GN6001	Research Methodology	0-2-0:2	2016

No.	Course Outcome - 04GN6001 - Research Methodology	Target
CO1	To get introduced to research philosophy and processes in general.	60%
CO2	To formulate the research problem and prepare research plan	60%
CO3	Got the basic idea of IPR, copyright and patent for the social development	60%
CO4	To apply various numerical /quantitative techniques for data analysis	60%
CO5	To prepare and communicate the research findings effectively with modern tool	60%

COURSE END SURVEY - 04GN6001 - Research Methodology

Sl.No	Questions & Options
CO1	to what extent you understand what is research means and its types
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	At what confidence level you are able to formulate and prepare research problem and plan
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	what level you understand the importance of IPR Copy right and patent
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
	at what extent you apply various numerical /quantitative techniques for data analysis

CO4	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO5	how much you are capable of preparing and communicate the research findings effectively with modern tool
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - 04GN6001 - Research Methodology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1	2								
CO2		2										
CO3									2			
CO4			3	3	3							
CO5									3			

CO->PSO MAPPING - 04GN6001 - Research Methodology

CO/PSO	PSO1	PSO2	PSO3
CO1		2	
CO2			
CO3			
CO4	2		
CO5			

COURSE->PO MAPPING - 04GN6001 - Research Methodology

04GN6001/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		2	3	3	3				3			

COURSE->PSO MAPPING - 04GN6001 - Research Methodology

04GN6001/PSO	PSO1	PSO2	PSO3
	2	2	

04CH6101

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6101	MATHEMATICAL METHODS FOR NANOTECHNOLOGY	3-1-0:4	2016

No.	Course Outcome - 04CH6101 - MATHEMATICAL METHODS FOR NANOTECHNOLOGY	Target
CO1	Demonstrate the use of Linear transformations and vector spaces.	60%
CO2	Demonstrate the use of Matrix of transformations and Inner product spaces.	60%

CO3	Illustrate the use of power series for solving and studying the solutions of partial differential equations	60%
CO4	Classify, formulate and solve partial differential equations	60%
CO5	Demonstrate the method of series solution of ordinary differential equations	60%
CO6	Demonstrate the tensor representations for vector algebra	60%

COURSE END SURVEY - 04CH6101 - MATHEMATICAL METHODS FOR NANOTECHNOLOGY

Sl.No	Questions & Options
CO1	To what extend you are able to demonstrate the use of Linear transformations and vector spaces
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend you are able to demonstrate the use of Matrix of transformations and Inner product spaces.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend you are able to illustrate the use of power series for solving and studying the solutions of partial differential equations
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend you are able to classify, formulate and solve partial differential equations
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend you are able to demonstrate the method of series solution of ordinary differential equations
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend you are able to demonstrate the tensor representations for vector algebra
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6101 - MATHEMATICAL METHODS FOR NANOTECHNOLOGY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2			1						1		1
CO2	2			1						1		1
CO3	2			1						1		1
CO4	2			1						1		1
CO5	2			1						1		1
CO6	2			1						1		1

CO->PSO MAPPING - 04CH6101 - MATHEMATICAL METHODS FOR NANOTECHNOLOGY

CO/PSO	PSO1	PSO2	PSO3
CO1	2	1	

CO2	2	1	
CO3	2	1	
CO4	2	1	
CO5	2	1	
CO6	2	1	

COURSE->PO MAPPING - 04CH6101 - MATHEMATICAL METHODS FOR NANOTECHNOLOGY

04CH6101/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2			1						1		1

COURSE->PSO MAPPING - 04CH6101 - MATHEMATICAL METHODS FOR NANOTECHNOLOGY

04CH6101/PSO	PSO1	PSO2	PSO3
	2	1	

04CH6105

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6105	PHYSICS OF MATERIALS	3-0-0:4	2016

No.	Course Outcome - 04CH6105 - PHYSICS OF MATERIALS	Target
CO1	Demonstrate the basic principles of Quantum mechanics and interpret them.	60%
CO2	Develop time independent Schrodinger equation and apply it to motion of free and confined particles.	60%
CO3	Demonstrate quantum confinement in nanostructures and illustrate the working of devices based on it.	60%
CO4	Explain the synthesis, properties and applications of selected inorganic nanomaterials and structures	60%
CO5	Illustrate the synthesis, properties and applications of selected organic nanomaterials and nanomaterials for molecular electronics and optoelectronics	60%
CO6	Identify the structure and properties of localized particles and excitons	60%

COURSE END SURVEY - 04CH6105 - PHYSICS OF MATERIALS

Sl.No	Questions & Options
CO1	To what extend you are able to demonstrate the basic principles of Quantum mechanics and interpret them? Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO2	Are you able to develop time independent Schrodinger equation and apply it to the motion of free and confined particles?

	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO3	Can you demonstrate quantum confinement in nanostructures and illustrate the working of devices based on it?
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO4	Can you explain the synthesis, properties and applications of selected inorganic nanomaterials and structures?
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO5	How far you are able to illustrate the synthesis, properties and applications of selected organic nanomaterials and nanomaterials for molecular electronics and optoelectronics?
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO6	To what extent you are able to identify the structure and properties of localized particles and excitons?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - 04CH6105 - PHYSICS OF MATERIALS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1	2	2	2	1		1	2		2
CO2			1	1	1	2			1	2		1
CO3	1	1	2	2	1	2		1	1	2		1
CO4	3	3	3	3	3	3	2	1	2	2	1	2
CO5	3	3	3	3	3	3	2	1	2	2	1	2
CO6	1	1	1	1		1				2		1

CO->PSO MAPPING - 04CH6105 - PHYSICS OF MATERIALS

CO/PSO	PSO1	PSO2	PSO3
CO1	1	3	1
CO2	1	2	
CO3	2	3	1
CO4	2	3	2
CO5	2	3	1
CO6	1	2	1

COURSE->PO MAPPING - 04CH6105 - PHYSICS OF MATERIALS

04CH6105/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	3	2	1	2	2	1	2

COURSE->PSO MAPPING - 04CH6105 - PHYSICS OF MATERIALS

04CH6105/PSO	PSO1	PSO2	PSO3
	2	3	2

04CH6111

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6111	Carbon Nanomaterial Science and Technology	3-0-0:3	2016

No.	Course Outcome - 04CH6111 - Carbon Nanomaterial Science and Technology	Target
CO1	Ability to distinguish the structure, methods of preparation and properties of carbon nanotubes	60%
CO2	Gain the knowledge of significant applications of carbon nanotubes in various fields to develop new devices and materials	60%
CO3	Apply the principles of spectroscopy to address the optical and photoluminescence performance of carbon nanotubes	60%
CO4	Interpret the magnetic and photoconductive properties of carbon nanotubes for their vibrant utility in electronics	60%
CO5	Demonstrate the electrical transport and electroluminescence behavior of carbon nanotubes	60%
CO6	Explore the potential applications of inorganic nanotubes, fullerenes and graphene in nanotechnology and chemical areas	60%

COURSE END SURVEY - 04CH6111 - Carbon Nanomaterial Science and Technology

Sl.No	Questions & Options
CO1	To what extent you are able to distinguish the structure, methods of preparation and properties of carbon nanotubes
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you are able to gain the knowledge of significant applications of carbon nanotubes in various fields to develop new devices and materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well you are able to apply the principles of spectroscopy to address the optical and photoluminescence performance of carbon nanotubes
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	To what extent you are able to interpret the magnetic and photoconductive properties of carbon nanotubes for their vibrant utility in electronics
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent you are able to demonstrate the electrical transport and electroluminescence behavior of carbon nanotubes
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO6	To what extent you are able to explore the potential applications of inorganic nanotubes, fullerenes and graphene in nanotechnology and chemical areas
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - 04CH6111 - Carbon Nanomaterial Science and Technology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1		2	2	1				
CO2	2	1	1		1	1	2	1				1
CO3			3									
CO4	2	1	2			3						
CO5			1			1	2					
CO6		2	2		1	1	1		1			

CO->PSO MAPPING - 04CH6111 - Carbon Nanomaterial Science and Technology

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	
CO2	2	2	
CO3	1	1	
CO4	2	1	
CO5	2	1	
CO6	2	1	

COURSE->PO MAPPING - 04CH6111 - Carbon Nanomaterial Science and Technology

04CH6111/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	1	3	2	1	1			1

COURSE->PSO MAPPING - 04CH6111 - Carbon Nanomaterial Science and Technology

04CH6111/PSO	PSO1	PSO2	PSO3
	2	2	

04CH6191

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6191	Seminar	0-0-2:2	2016

No.	Course Outcome - 04CH6191 - Seminar	Target
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CO1	Ability to effectively gather and interpret information from literature survey	65%
CO2	Ability to use knowledge gathered through literature survey to identify, formulate, analyze and solve complex problems and to evaluate and interpret various solutions	65%
CO3	Gain the ability to communicate effectively with written, oral, and visual means in a technical setting.	65%
CO4	Ability to cultivate the critically analyzing the recent technological advancement in the seminar report	65%
CO5	Students will be able to present a technical topic systematically	65%
CO6	Complete an independent seminar report, resulting in at least a publication as a review in UGC approved journals and conference proceedings.	65%

COURSE END SURVEY - 04CH6191 - Seminar

Sl.No	Questions & Options
CO1	Are you able to effectively gather and interpret information from literature survey ?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	To what extend you use this literature survey knowledge to identify, formulate, analyse and solve complex problems and to interpret various results ?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extend you improved your communications skills after evaluation
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	Are u able to analyze critically the recent technological advancement in the area of Seminar
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	Are you able to present a technical topic systematically
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	Are u able to complete an independent seminar report with a posiibility of a publication
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6191 - Seminar

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1		1	1	1	1	3	1	1
CO2	3	2	1	1		1	1	1	1	3	1	1
CO3	2	1	1	1	1		1		1	3	1	1
CO4	2	1	1	1	1		1			3	1	2
CO5	3		1	1	1		1		1	3	1	2
CO6	3	1	1	1	1		1		1	3	1	3

CO->PSO MAPPING - 04CH6191 - Seminar

CO/PSO	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	1	2	1
CO3	2	2	2
CO4	2	2	1
CO5	2	2	3
CO6	2	2	3

COURSE->PO MAPPING - 04CH6191 - Seminar

04CH6191/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	1	1	1	1	1	1	1	3	1	3

COURSE->PSO MAPPING - 04CH6191 - Seminar

04CH6191/PSO	PSO1	PSO2	PSO3
	2	2	3

04CH6193

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6193	LAB I	0-0-2:1	2016

No.	Course Outcome - 04CH6193 - LAB I	Target
CO1	Synthesize nanomaterials via chemical methods	62%
CO2	Synthesize nanomaterials via physical methods	62%
CO3	Operate characterization equipments like UV-Vis Spectroscopy	62%
CO4	Synthesize of nanomaterial via sono-chemical method	62%
CO5	Analyze the applications of nanomaterials	62%

COURSE END SURVEY - 04CH6193 - LAB I

Sl.No	Questions & Options
CO1	How well have you learned to Synthesize nanomaterials via chemical methods
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	How well have you learned to Synthesize nanomaterials via physical methods
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>

CO3	How well are you able to operate characterization equipments like UV-Vis Spectroscopy
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	How well have you learned to synthesize nanomaterial via sono-chemical method
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	How well have you learned to Analyze the applications of nanomaterials
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>

CO->PO MAPPING - 04CH6193 - LAB I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3		1	2							
CO2		3		1	2							
CO3			3		2							
CO4		3		1								
CO5					2	3			1			

CO->PSO MAPPING - 04CH6193 - LAB I

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - 04CH6193 - LAB I

04CH6193/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		3	3	1	2	3			1			

COURSE->PSO MAPPING - 04CH6193 - LAB I

04CH6193/PSO	PSO1	PSO2	PSO3

04CH6109

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6109	Nano Chemistry	3-0-0:3	2016

No.	Course Outcome - 04CH6109 - Nano Chemistry	Target
CO1	To impart an awareness about the size effects on structure and properties of nanomaterials	60%
CO2	To disseminate the knowledge of nanoparticle morphology and superplastic nanostructured materials	60%
CO3	To transmit the knowledge of size effects on various properties of nanoparticles and its role in chemisorption, alloying effects and electronic effects	60%
CO4	To pass on the knowledge on catalysis using nanoparticles	60%
CO5	To relay on supramolecular chemistry and supercritical fluids	60%
CO6	To familiarise with nanoscale growth and thermodynamics of growth	60%

COURSE END SURVEY - 04CH6109 - Nano Chemistry

Sl.No	Questions & Options
CO1	To what extent the discussion will impart an awareness about the size effects on structure and properties of nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extent the dissemination of knowledge about nanoparticle morphology and superplastic nanostructured materials will take place
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	How much the transmission of knowledge about the performance of nanoparticles in chemisorption, alloying effects and electronic effects will take place ?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	How much knowledge will acquire based on nanoparticle catalysis
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent the knowledge on supramolecular chemistry and supercritical fluids will acquire ?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To What extent transmission of knowledge on nanoscale growth and its thermodynamics will take place ?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH6109 - Nano Chemistry

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1	2	3	1	1	1	1	1	1
CO2	3	3	3	1	2	3	1	1	1	1	1	1
CO3	3	3	2	1	2	2	1	1	1	1	1	1
CO4	2	2	1	1	2	3	1	1	1	1	1	1
CO5	1	2	1	1	2	3	1	1	1	1	1	1

CO6	2	2	1	1	2	2	1	1	1	1	1	1
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CO->PSO MAPPING - 04CH6109 - Nano Chemistry

CO/PSO	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	2	2	1
CO3	2	2	1
CO4	2	2	1
CO5	2	2	1
CO6	2	2	1

COURSE->PO MAPPING - 04CH6109 - Nano Chemistry

04CH6109/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	2	3	1	1	1	1	1	1

COURSE->PSO MAPPING - 04CH6109 - Nano Chemistry

04CH6109/PSO	PSO1	PSO2	PSO3
	2	2	1

SEMESTER-2**04CH6102**

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6102	INDUSTRIAL NANOTECHNOLOGY	3-1-0:4	2016

No.	Course Outcome - 04CH6102 - INDUSTRIAL NANOTECHNOLOGY	Target
CO1	Illustrate the concept of nano electronic devices and its operating systems	75%
CO2	Fuel cells processes and nanoparticle coating phenomena for electrical products	75%
CO3	Self assembled nanoreactors, Nanostructures for molecular recognition like quantum dots,nanorods and nanotubes	75%
CO4	Implementation of nanotechnology in agriculture and food industry sectors	75%
CO5	General nanofibre production,nano finishing in textiles,modern textiles and in cosmetics	75%

COURSE END SURVEY - 04CH6102 - INDUSTRIAL NANOTECHNOLOGY

Sl.No	Questions & Options
	What is the level of your understanding about the concepts of nanoelectronic devices

CO1	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Are you able to understand the fuel cell processes and nanoparticle coating phenomena
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	What is your ability to assembled the nanoreactors and nanostructure for molecular recognition
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	What is the level of your knowledge in industrial sector nanotechnology
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	What is your range of potential in nanofibre production,nano in modern textiles and in cosmetics
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - 04CH6102 - INDUSTRIAL NANOTECHNOLOGY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3			3	3						
CO2	2	2	3		3	3						
CO3	3	2	3		3	3						
CO4	3	1			3							
CO5	3	1										

CO->PSO MAPPING - 04CH6102 - INDUSTRIAL NANOTECHNOLOGY

CO/PSO	PSO1	PSO2	PSO3
CO1	2	2	
CO2	2	2	
CO3	3	2	
CO4	3		
CO5	3	2	

COURSE->PO MAPPING - 04CH6102 - INDUSTRIAL NANOTECHNOLOGY

04CH6102/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3		3	3						

COURSE->PSO MAPPING - 04CH6102 - INDUSTRIAL NANOTECHNOLOGY

04CH6102/PSO	PSO1	PSO2	PSO3
	3	2	

04CH6104

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6104	ADVANCED NANOMATERIALS	3-0-0:3	2016

No.	Course Outcome - 04CH6104 - ADVANCED NANOMATERIALS	Target
CO1	To Impart a knowledge of fundamental aspects of magnetic materials	60%
CO2	To create an awareness about the principles of magnetic behaviour in nanomaterials	60%
CO3	To apply the principles of nanotechnology for preparing specialized nano-materials as well as in agricultural applications	60%
CO4	To Interpret the applications of nanotechnology in food industry	60%
CO5	To provide an exposure to the production of nanofibers and cosmetics	60%
CO6	To explore the applications of nanotechnology in textile industry by assimilating various effects such as shark skin effect, lotus effect etc.	60%

COURSE END SURVEY - 04CH6104 - ADVANCED NANOMATERIALS

Sl.No	Questions & Options
CO1	How far you are able to acquire the knowledge of magnetic materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you can describe the magnetic behaviour in nanomaterials
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	How far you can illustrate the principles of nanotechnology for preparing nanomaterials and in agricultural applications
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	To what extent you can interpret the applications of nanotechnology in food industry
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	How far you are able to assimilate and apply the concepts of production of nanofibers and cosmetics
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO6	To what extent you can find applications of nanotechnology in textile industry
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH6104 - ADVANCED NANOMATERIALS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1		2	1						
CO2	1	3	2	1	1			1	1			1
CO3	1	3	3	2	1	1	1	1	1			1

CO4	2	1	1		1	1	2	3	2			1
CO5	1	2			2	2						
CO6	2	2	3	1	1	1			1			1

CO->PSO MAPPING - 04CH6104 - ADVANCED NANOMATERIALS

CO/PSO	PSO1	PSO2	PSO3
CO1	1		
CO2	1		
CO3	3	1	
CO4	1	2	
CO5	1		
CO6	3	2	

COURSE->PO MAPPING - 04CH6104 - ADVANCED NANOMATERIALS

04CH6104/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	3	2	2	2	2	3	2			1

COURSE->PSO MAPPING - 04CH6104 - ADVANCED NANOMATERIALS

04CH6104/PSO	PSO1	PSO2	PSO3
	3	2	

04CH6106

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6106	Experimental And Characterization Techniques For Nanotechnology	3-0-0:3	2016

No.	Course Outcome - 04CH6106 - Experimental And Characterization Techniques For Nanotechnology	Target
CO1	Describe the experimental methods generally applied for the characterization of nanomaterials.	60%
CO2	Explain factorial designs and methods used for error analysis.	60%
CO3	Describe the methods used to measure thermal conductivity of nanofluids.	60%
CO4	Explain the spectroscopic techniques used for the optical characterization of nanomaterials.	60%
CO5	Demonstrate the microscopic techniques used for the characterization of microstructure in nanomaterials.	60%
CO6	Illustrate the use of neutron and X-ray diffraction for the structural characterization of nanomaterials.	60%

COURSE END SURVEY - 04CH6106 - Experimental And Characterization Techniques For Nanotechnology

Sl.No	Questions & Options
CO1	How far you can describe the experimental methods generally applied for the characterization of nanomaterials?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	How far you can explain factorial designs and methods used for error analysis?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	How far can you describe the methods used to measure thermal conductivity of nanofluids?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	How far can you explain the spectroscopic techniques used for the optical characterization of nanomaterials?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO5	To what extent can you demonstrate the microscopic techniques used for the characterization of microstructure in nanomaterials?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	How far can you illustrate the use of neutron and X-ray diffraction for the structural characterization of nanomaterials?
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - 04CH6106 - Experimental And Characterization Techniques For Nanotechnology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	3	3	3	2	2	1	2		2
CO2	1	1	2	3	3	2	1	2	2	1	1	2
CO3	1	1	3	3	3	2	1	1	1	2	2	
CO4	3	3	3	2	3	3	2	1	1	2	1	3
CO5	3	3	3	3	2	3	2	2	2	1		2
CO6	3	2	3	3	3	3	1	1	2	1	1	2

CO->PSO MAPPING - 04CH6106 - Experimental And Characterization Techniques For Nanotechnology

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	2
CO2	1	1	
CO3	2	3	1
CO4	3	3	2
CO5	3	3	2

CO6	2	3	1
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COURSE->PO MAPPING - 04CH6106 - Experimental And Characterization Techniques For Nanotechnology

04CH6106/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	3	2	2	2	2	2	3

COURSE->PSO MAPPING - 04CH6106 - Experimental And Characterization Techniques For Nanotechnology

04CH6106/PSO	PSO1	PSO2	PSO3
	3	3	2

04CH6116

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6116	NANO TOXICOLOGY	3-0-0:3	2016

COURSE END SURVEY - 04CH6116 - NANO TOXICOLOGY**CO->PO MAPPING - 04CH6116 - NANO TOXICOLOGY**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - 04CH6116 - NANO TOXICOLOGY

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - 04CH6116 - NANO TOXICOLOGY

04CH6116/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH6116 - NANO TOXICOLOGY

04CH6116/PSO	PSO1	PSO2	PSO3

04CH6118

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6118	Polymer Nanocomposites	3-0-0:3	2016

No.	Course Outcome - 04CH6118 - Polymer Nanocomposites	Target
CO1	Describe the fundamental aspects of polymeric nanocomposites	60%
CO2	Impart a knowledge of developing polymer nanocomposites.	60%
CO3	Expose to the ways to improve the polymer nanofiller interaction	60%
CO4	To acquaint with various basic properties of polymer nanocomposites	60%

CO5	To acquaint with various processing properties as well as its biodegradation behaviour	60%
CO6	To familiarize with the crystallization behaviour and applications of polymer nanocomposites	60%

COURSE END SURVEY - 04CH6118 - Polymer Nanocomposites

Sl.No	Questions & Options
CO1	To what extent you describe the fundamental aspects of polymeric nanocomposites
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you impart a knowledge of developing polymer nanocomposites.
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent you expose to the ways of improving polymer- nanofiller interactions
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	To what extent you acquaint with basic properties of polymer nanocomposites
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent you acquaint with various processing properties as well as its biodegradation behaviour of polymer nanocomposites
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent you familiarize with the crystallization behaviour and applications of polymer nanocomposites
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6118 - Polymer Nanocomposites

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1		1									
CO2	1	2	1									
CO3	2	3	1	1								
CO4	1		2									
CO5	1		2									
CO6	1		2									

CO->PSO MAPPING - 04CH6118 - Polymer Nanocomposites

CO/PSO	PSO1	PSO2	PSO3
CO1	2		
CO2	2		
CO3	2		
CO4	1		

CO5	1		
CO6	1		

COURSE->PO MAPPING - 04CH6118 - Polymer Nanocomposites

04CH6118/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	2	1								

COURSE->PSO MAPPING - 04CH6118 - Polymer Nanocomposites

04CH6118/PSO	PSO1	PSO2	PSO3
	2		

04CH6192

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6192	Mini Project	0-0-4:2	2016

No.	Course Outcome - 04CH6192 - Mini Project	Target
CO1	To identify a technical problem relevant to nanotechnology based on literature survey and develop a scientific problem	60%
CO2	Analyze the problem systematically and develop objective statements to complete the review report and conduct the experiments as per the work plan	60%
CO3	Develop a work plan with short term (weekly) and long term (monthly goals) goals	60%
CO4	Conduct the experiments as per the work plan and document it	60%
CO5	Analyze the results and make a report and communicate the results to journals.	60%

COURSE END SURVEY - 04CH6192 - Mini Project

Sl.No	Questions & Options
CO1	How far you are able to to identify a technical problem relevant to nanotechnology based on literature survey and develop a scientific problem Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To What extent you can analyze the problem systematically and develop objective statements to complete the review report and conduct the experiments as per the work plan Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extent you are able to develop a work plan with short term (weekly) and long term (monthly goals) goals Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	How far you can able to conduct the experiments as per the work plan and document it

	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	How far you can analyze the results and make a report and communicate the results to journals.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH6192 - Mini Project

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

CO->PSO MAPPING - 04CH6192 - Mini Project

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - 04CH6192 - Mini Project

04CH6192/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH6192 - Mini Project

04CH6192/PSO	PSO1	PSO2	PSO3

04CH6194

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6194	LAB II	0-0-2:1	2016

No.	Course Outcome - 04CH6194 - LAB II	Target
CO1	Evaluate the morphology and topography of nanomaterials	61%
CO2	Develop and characterize nanocomposites	61%
CO3	Estimate particle size of nano-materials	61%

CO4	Evaluate crystallinity and phases in a material	61%
CO5	Identify the functional groups of nanomaterials	61%

COURSE END SURVEY - 04CH6194 - LAB II

Sl.No	Questions & Options
CO1	To what extend are you able to Evaluate the morphology and topography of nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend are you able to develop and characterize nano-composites
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend are you able to develop estimate particle size of nano-materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend are you able to evaluate crystallinity and phases in a material
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend are you able to identify the functional groups of nano-materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6194 - LAB II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	3	1	1			2	1		1
CO2	2	3	3	1	3	2			1	1		2
CO3	2	2	3	1	3	1	1		1	1		2
CO4	2	2	3	1	3	2	1		2	1		3
CO5	2	2	3	1	3	2	1		1	1		2

CO->PSO MAPPING - 04CH6194 - LAB II

CO/PSO	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	2	3	
CO3	1	3	
CO4	2	3	
CO5	1	3	

COURSE->PO MAPPING - 04CH6194 - LAB II

04CH6194/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	3	3	3	2	1		2	1		3

COURSE->PSO MAPPING - 04CH6194 - LAB II

04CH6194/PSO	PSO1	PSO2	PSO3
	2	3	1

04CH6112

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6112	Nanotechnology in Energy Conversion and Storage	3-0-0:3	2016

COURSE END SURVEY - 04CH6112 - Nanotechnology in Energy Conversion and Storage**CO->PO MAPPING - 04CH6112 - Nanotechnology in Energy Conversion and Storage**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - 04CH6112 - Nanotechnology in Energy Conversion and Storage

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - 04CH6112 - Nanotechnology in Energy Conversion and Storage

04CH6112/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH6112 - Nanotechnology in Energy Conversion and Storage

04CH6112/PSO	PSO1	PSO2	PSO3

04CH6114

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6114	Nano biotechnology	3-0-0:3	2016

No.	Course Outcome - 04CH6114 - Nano biotechnology	Target
CO1	Describe nanoparticles based on their dimensionality and understand the role of proteins in biomaterials.	71%
CO2	Demonstrate knowledge about the principles of bionanomachines and understand the techniques behind their construction.	71%
CO3	Learn the concepts, broad applications of self-assembly phenomena and know the basic self-assembling techniques.	71%
CO4	Understand protein based nanostructures, application in bioelectronic devices and their microbial production.	71%

CO5	Explain knowledge and principles associated with DNA based nanostructures, applications in medical diagnostics and drug delivery.	71%
CO6	Account and give examples of applications of nanobiotechnology in various fields.	71%

COURSE END SURVEY - 04CH6114 - Nano biotechnology

Sl.No	Questions & Options
CO1	To what extent you are able to explain the dimensionality of nanoparticles and role of proteins in biomaterials?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent you understood the principles of bio nanomachines and techniques behind the construction.?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent you are able to explain basic self-assembling techniques..?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what understood the protein-based nanostructures, application in bioelectronic devices and their microbial production.?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent able to explain about DNA based nanostructures their applications in medical diagnostics and drug delivery?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent able to explain applications of nanobiotechnology in various fields.?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6114 - Nano biotechnology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	3	1	3	2	1	1	2	2	2	3
CO2	2	2	3	1	3	2	1	1	2	2	2	3
CO3	2	2	3	1	3	2	1	1	2	2	2	3
CO4	1	2	3	1	3	2	1	1	2	2	2	3
CO5	2	2	3	1	3	2	1	1	2	2	2	3
CO6	2	1	3	1	3	2	2	2	2	2	2	3

CO->PSO MAPPING - 04CH6114 - Nano biotechnology

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	3

CO3	3	3	3
CO4	3	3	3
CO5	3	3	3
CO6	3	3	3

COURSE->PO MAPPING - 04CH6114 - Nano biotechnology

04CH6114/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	2	3	1	3	2	2	2	2	2	2	3

COURSE->PSO MAPPING - 04CH6114 - Nano biotechnology

04CH6114/PSO	PSO1	PSO2	PSO3
	3	3	3

04CH6124

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6124	Nanomedicine	3-0-0:3	2016

No.	Course Outcome - 04CH6124 - Nanomedicine	Target
CO1	Identify the structure and properties of biological nanomaterials.	61%
CO2	Describe the various polymeric materials used in nano-biotechnology	61%
CO3	Illustrate the use of nano-materials for drug delivery	61%
CO4	Categorize various biomedical nano-particles and their conjugations.	61%
CO5	Illustrate cancer targeting and treatment techniques using nanomaterials	61%
CO6	Discuss the various aspects of immunotherapy using nano-materials	61%

COURSE END SURVEY - 04CH6124 - Nanomedicine

Sl.No	Questions & Options
CO1	To what extend are you able to identify the structure and properties of biological nano-materials.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend are you able to describe the various polymeric materials used in nano-biotechnology
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend are you able to illustrate the use of nano-materials for drug delivery
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO4	To what extend are you able to categorize various biomedical nano-particles and their conjugations.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend are you able to illustrate cancer targeting and treatment techniques using nano-materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend are you able to discuss the various aspects of immunotherapy using nano-materials
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6124 - Nanomedicine

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1		1		1	1				
CO2	1	1	1		2		3	2				
CO3	1	1	1		2		3	3				
CO4	1	2	1		2		3	3				
CO5	1	1	1		2		3	3				
CO6	1	1	1		1		3	3				

CO->PSO MAPPING - 04CH6124 - Nanomedicine

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	
CO2	1	1	
CO3	2	2	
CO4	1	2	
CO5	2	2	
CO6	1	2	

COURSE->PO MAPPING - 04CH6124 - Nanomedicine

04CH6124/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	2	1		2		3	3				

COURSE->PSO MAPPING - 04CH6124 - Nanomedicine

04CH6124/PSO	PSO1	PSO2	PSO3
	2	2	

SEMESTER-3**04CH7107**

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7107	Photonics and Plasmonics	3-0-0:3	2016

No.	Course Outcome - 04CH7107 - Photonics and Plasmonics	Target
CO1	Explain the significance of Maxwell's equations and demonstrate Bloch's theorem for the development of band gaps in photonic crystals	66%
CO2	Demonstrate the development of optical band gaps in 1-, 2-, and 3 dimensional photonic crystals	66%
CO3	Illustrate the applications of photonic crystals and photonic crystal fibers.	66%
CO4	Demonstrate the applications of nonlinear photonic crystal devices	66%
CO5	Explain the development of plasmonics at nanoscale dimensions and the interactions involved	66%
CO6	Demonstrate surface plasmon resonance and the features of near-field photonics	66%

COURSE END SURVEY - 04CH7107 - Photonics and Plasmonics

Sl.No	Questions & Options
CO1	How far you are able to explain the significance of Maxwell's equations and demonstrate Bloch's theorem for the development of band gaps in photonic crystals?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	How far your are able to demonstrate the development of optical band gaps in 1-, 2-, and 3 dimensional photonic crystals
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well can you Illustrate the applications of photonic crystals and photonic crystal fibers.
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How well you are able to demonstrate the applications of nonlinear photonic crystal devices?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	Hw well can you explain the development of plasmonics at nanoscale dimensions and the interactions involved?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	How well can you demonstrate surface plasmon resonance and the features of near-field photonics?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH7107 - Photonics and Plasmonics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	2					
CO2	3	3	3	3	3	3	2					3

CO3	3	3	3	3	3	3						
CO4	3	3	3	3	3	3						
CO5	3	3	3	3	3	3						
CO6	3	3	3	3	3	3						

CO->PSO MAPPING - 04CH7107 - Photonics and Plasmonics

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - 04CH7107 - Photonics and Plasmonics

04CH7107/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	3	3	2					3

COURSE->PSO MAPPING - 04CH7107 - Photonics and Plasmonics

04CH7107/PSO	PSO1	PSO2	PSO3

04CH7191

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7191	Seminar	0-0-2:2	2016

No.	Course Outcome - 04CH7191 - Seminar	Target
CO1	Interpreting and gathering information from survey of literature	70%
CO2	Identify, formulate, analyse and provide solution based on the knowledge gathered from literature survey	60%
CO3	Effectively communicate by written, oral and visual means	65%
CO4	To be able to make technical presentations	65%
CO5	To be able to prepare seminar report and publications	60%

COURSE END SURVEY - 04CH7191 - Seminar

Sl.No	Questions & Options
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CO1	To what extent you are able to interpreting and gathering information from survey of literature
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	To what extend you are able to identify, formulate, analyse and provide solution based on the knowledge gathered from literature survey
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	To what extend you are able to effectively communicate by written, oral and visual means
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extend you are able to make technical presentations
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extend you are able to prepare seminar report and publications
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH7191 - Seminar

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

CO->PSO MAPPING - 04CH7191 - Seminar

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - 04CH7191 - Seminar

04CH7191/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH7191 - Seminar

04CH7191/PSO	PSO1	PSO2	PSO3

04CH7101

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7101	Self Assembling nanostructured molecular materials and devices	3-0-0:3	2016

No.	Course Outcome - 04CH7101 - Self Assembling nanostructured molecular materials and devices	Target
CO1	To understand the basic concepts of nano-self-assembly of nano-materials and bio-molecules	60%
CO2	To analyse the formation and applications of Vesicles and Liposomes	60%
CO3	To analyse the unique properties of Dendrimers and their applications	60%
CO4	Prepare natural and artificial Supramolecular Complexes	60%
CO5	Prepare SAMs and Langmuir Blodgett films	60%
CO6	Evaluate mesoporous materials and their applications	60%

COURSE END SURVEY - 04CH7101 - Self Assembling nanostructured molecular materials and devices

Sl.No	Questions & Options
CO1	How well can you understand the basic concepts of nano-self-assembly of nano-materials and bio-molecules
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	How well can you analyse the formation and applications of Vesicles and Liposomes
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	How well can you analyse the unique properties of Dendrimers and their applications
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	How familiar are you with the preparation of natural and artificial Supramolecular Complexes
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO5	How familiar are you with the preparation methods for SAMs and Langmuir Blodgett films
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO6	How well can you evaluate mesoporous materials and their applications
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH7101 - Self Assembling nanostructured molecular materials and devices

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2			1	1							
CO2		2			2		1					
CO3		3			3				1			
CO4		3		1		1						

CO5		3		1	3	1						
CO6		2	1		3							

CO->PSO MAPPING - 04CH7101 - Self Assembling nanostructured molecular materials and devices

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - 04CH7101 - Self Assembling nanostructured molecular materials and devices

04CH7101/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	1	1	3	1	1		1			

COURSE->PSO MAPPING - 04CH7101 - Self Assembling nanostructured molecular materials and devices

04CH7101/PSO	PSO1	PSO2	PSO3

04CH7115

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7115	Drug delivery Systems	3-0-0:3	2016

No.	Course Outcome - 04CH7115 - Drug delivery Systems	Target
CO1	To describe the basic principles and operation of image acquisition and interpretation using MRI and NMR along with an understanding of their instrumentation.	72%
CO2	To understand the fundamentals and principles of bioactive glasses, their preparation, properties and applications of these in drug delivery systems.	72%
CO3	To know about nanomaterials used in medical implants and cancer treatment	72%
CO4	To learn the approaches to the diagnosis and treatment of common cancers and familiarize with the various strategies used in targeted therapies.	72%
CO5	To be familiar with the different materials and approaches used in the design and fabrication of drug delivery systems.	72%
CO6	To understand the strategies and considerations in the design of different drug delivery systems that will optimize drug delivery to the body from different routes of administration.	72%

COURSE END SURVEY - 04CH7115 - Drug delivery Systems

Sl.No	Questions & Options
CO1	Are you able to distinguish between the principle and operation of an MRI and NMR
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	Can you name a bioactive material and its application
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	Are you satisfied with the knowledge about implants and their use in cancer treatment
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO4	Do you feel that this section was advanced
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO5	Do you agree that you can associate with design of drug delivery systems
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO6	Do you agree that your knowledge on drug delivery routes is increased
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO->PO MAPPING - 04CH7115 - Drug delivery Systems

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1		1		1		1	1		1	1	
CO2	1	3	3	2	2	1			2	2		1
CO3			2		1	1			1	1		1
CO4			1			1						
CO5		3	2	1	1	2			1			
CO6		2		1		1			1			1

CO->PSO MAPPING - 04CH7115 - Drug delivery Systems

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3	3	
CO3	3	2	
CO4	3	2	
CO5	2	2	
CO6	1	2	

COURSE->PO MAPPING - 04CH7115 - Drug delivery Systems

04CH7115/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	3	3	2	2	2	1	1	2	2	1	1

COURSE->PSO MAPPING - 04CH7115 - Drug delivery Systems

04CH7115/PSO	PSO1	PSO2	PSO3
	3	3	

04CH7193

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7193	PROJECT (PHASE I)	0-0-12:6	2016

No.	Course Outcome - 04CH7193 - PROJECT (PHASE I)	Target
CO1	Ability to effectively gather and interpret information from literature survey	60%
CO2	Ability to use knowledge gathered through literature survey to identify, formulate, analyze and solve complex problems and to evaluate and interpret various solutions	60%
CO3	Gain the ability to communicate effectively with written, oral, and visual means in a technical setting.	60%
CO4	Ability to use modern techniques of characterization and analysis tools and materials	60%
CO5	Students will be able to carry out investigations involved in design, consider and evaluate alternate assumptions, approaches, and procedures. Ability to fabricate system components related to engineering problems giving consideration to environment and society	60%
CO6	Complete an independent research project, resulting in at least a thesis publication, and research outputs in terms of publications in SCI indexed journals and conference proceedings	60%

COURSE END SURVEY - 04CH7193 - PROJECT (PHASE I)

Sl.No	Questions & Options
CO1	Are you able to effectively gather and interpret information from literature survey ? Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO2	To what extend you use this literature survey knowledge to identify, formulate, analyse and solve complex problems and to interpret various results ? Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extent you improved your communications skills after evaluation Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Did you ever gone through any modern characterization techniques and advanced engineering materials while completing thesis ? Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO5	Did you ever considered environmental impact and ethics in your design and fabrication ?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	Are you able to make good project report with a possibility of a publication in conference and journal
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO->PO MAPPING - 04CH7193 - PROJECT (PHASE I)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		2			1							
CO2	2			1								
CO3												
CO4	1		3	2	2							
CO5	3	2	2	3								
CO6				1								

CO->PSO MAPPING - 04CH7193 - PROJECT (PHASE I)

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - 04CH7193 - PROJECT (PHASE I)

04CH7193/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	3	3	2							

COURSE->PSO MAPPING - 04CH7193 - PROJECT (PHASE I)

04CH7193/PSO	PSO1	PSO2	PSO3

04CH7103

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7103	Societal Implications of Nanotechnology	3-0-0:3	2016

No.	Course Outcome - 04CH7103 - Societal Implications of Nanotechnology	Target
CO1	To correlate the use of nanotechnology products with their impact on society	66%
CO2	Identify specific models for nanotechnology commercialization and sustainability, and Equity.	66%
CO3	Analyse the behavior of nanotechnological revolution and commercialization on society	66%
CO4	Familiarize with the regulatory issues and their impacts on development on nanotechnology based products	66%
CO5	Understand the ethics and laws related to nanotechnology	66%
CO6	To understand the intellectual property rights associated with the development of nanotechnology	66%

COURSE END SURVEY - 04CH7103 - Societal Implications of Nanotechnology

Sl.No	Questions & Options
CO1	To what extent you are able to correlate the use of nanotechnology products with their impact on society
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	-To what extent you are able to identify specific models for nanotechnology commercialization and sustainability, and Equity.
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	to what extent you are able to Analyse the behavior of nanotechnological revolution and commercialization on society
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	To what extent you are able to familiarize with the regulatory issues and their impacts on development on nanotechnology based products
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	To what extent you are able to Understand the ethics and laws related to nanotechnology
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	To what extent you are able to To understand the intellectual property rights associated with the development of nanotechnology
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH7103 - Societal Implications of Nanotechnology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2						3	3				
CO2	2						3	3				
CO3	2						3	3				
CO4	2						3	3				
CO5	2						3	3			3	

CO6	2						3	3				
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CO->PSO MAPPING - 04CH7103 - Societal Implications of Nanotechnology

CO/PSO	PSO1	PSO2	PSO3
CO1	1		1
CO2	1		
CO3	1		
CO4	1		
CO5	1		3
CO6	1		

COURSE->PO MAPPING - 04CH7103 - Societal Implications of Nanotechnology

04CH7103/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2						3	3			3	

COURSE->PSO MAPPING - 04CH7103 - Societal Implications of Nanotechnology

04CH7103/PSO	PSO1	PSO2	PSO3
	1		3

04CH7109

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7109	Nanodevice Technology	3-0-0:3	2016

COURSE END SURVEY - 04CH7109 - Nanodevice Technology**CO->PO MAPPING - 04CH7109 - Nanodevice Technology**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO->PSO MAPPING - 04CH7109 - Nanodevice Technology

CO/PSO	PSO1	PSO2	PSO3
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COURSE->PO MAPPING - 04CH7109 - Nanodevice Technology

04CH7109/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH7109 - Nanodevice Technology

04CH7109/PSO	PSO1	PSO2	PSO3

SEMESTER-4

04CH7194

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7194	Project (Phase -II)	0-0-21:12	2016

No.	Course Outcome - 04CH7194 - Project (Phase -II)	Target
CO1	Ability to effectively gather and interpret information from literature survey.	60%
CO2	Ability to use knowledge gathered through literature survey to identify, formulate, analyze and solve complex problems and to evaluate and interpret various solutions	60%
CO3	Gain the ability to communicate effectively with written, oral, and visual means in a technical setting.	60%
CO4	Ability to use modern techniques of characterization and analysis of materials	60%
CO5	Students will be able to carry out calculations involved in synthesis, characterisation, and evaluate alternate assumptions, approaches, and procedures. Ability to fabricate system components related to engineering problems giving consideration to environment and society	60%
CO6	Complete an independent research project, resulting in at least a thesis publication, and research outputs in terms of publications in SCI indexed journals and conference proceedings	60%

COURSE END SURVEY - 04CH7194 - Project (Phase -II)

Sl.No	Questions & Options
CO1	Are you able to effectively gather and interpret information from literature survey ? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO2	To what extent you use this literature survey knowledge to identify, formulate, analyse and solve complex problems and to interpret various results ? Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extent you improved your communications skills after evaluation Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO4	Did you ever gone through any modern characterization techniques and advanced engineering materials while completing thesis ? Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	Did you ever considered environmental impact and ethics in your design and fabrication ? Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	Did you able to publish your research output in any of SCI indexed journals or conference proceedings ? Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - 04CH7194 - Project (Phase -II)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1							1		

CO2	2	2	2					2				
CO3										2		
CO4	2	3	2									1
CO5	2											1
CO6		1		1						1		

CO->PSO MAPPING - 04CH7194 - Project (Phase -II)

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2		1	
CO3			3
CO4	2		
CO5	1	1	
CO6			

COURSE->PO MAPPING - 04CH7194 - Project (Phase -II)

04CH7194/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	3	2	1				2		2		1

COURSE->PSO MAPPING - 04CH7194 - Project (Phase -II)

04CH7194/PSO	PSO1	PSO2	PSO3
	2	1	3

M.Tech-Environmental Engineering**SEMESTER-1****04CH6201**

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6201	Applied Statistics	4-0-0:4	2020

No.	Course Outcome - 04CH6201 - Applied Statistics	Target
CO1	Understand various probability distributions and their fitting	50%
CO2	Choose suitable sampling technique during environmental sampling	60%
CO3	Evaluate the relationship between various environmental parameters	55%

CO4	Make conclusion or prediction using different types of statistical inferences based on the collected data	60%
CO5	Analyze various experimental data sets based on their means and apply different types of experimental designs	50%
CO6	Analyze the data collected over time and forecast the future values	55%

COURSE END SURVEY - 04CH6201 - Applied Statistics

Sl.No	Questions & Options
CO1	CO2
CO3	CO4
CO5	CO6

CO->PO MAPPING - 04CH6201 - Applied Statistics

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		1		1					1		1
CO2	3		1		2					1		1
CO3	3		1		3					1		1
CO4	3		1		3					1		1
CO5	3		1		3					1		1
CO6	3		1		3					1		1

CO->PSO MAPPING - 04CH6201 - Applied Statistics

CO/PSO	PSO1	PSO2	PSO3
CO1			2
CO2			2
CO3		2	2
CO4		2	2
CO5		2	3
CO6		2	3

COURSE->PO MAPPING - 04CH6201 - Applied Statistics

04CH6201/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3		1		3					1		1

COURSE->PSO MAPPING - 04CH6201 - Applied Statistics

04CH6201/PSO	PSO1	PSO2	PSO3

		2	3
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04CH6203

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6203	ENVIRONMENTAL CHEMISTRY	4-0-0:4	2020

No.	Course Outcome - 04CH6203 - ENVIRONMENTAL CHEMISTRY	Target
CO1	Understand the adsorption mechanisms and the governing factors and the fundamentals of acid-base equilibrium	65%
CO2	Understand the properties of colloids and their removal, and the summarize the principles of reverse osmosis and spectroscopy	65%
CO3	Understand the various aspects of radioactivity and the implement proper management of radioactive waste	60%
CO4	Characterize the water for physicochemical and biological parameters and to apply the advanced oxidation processes for mineralization of organic pollutants	60%
CO5	Classify major organic pollutants in the environment and employ the biodegradation and enzyme based reactions for pollutant removal	60%
CO6	Summarize the various chromatographic, electrophoretic and spectroscopic techniques used in analysis of environmental samples	60%

COURSE END SURVEY - 04CH6203 - ENVIRONMENTAL CHEMISTRY

Sl.No	Questions & Options
CO1	CO2
CO3	CO4
CO5	CO6

CO->PO MAPPING - 04CH6203 - ENVIRONMENTAL CHEMISTRY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2									
CO2	3	1	2									
CO3	3	1	2									
CO4	3	1	2									
CO5	3	2	2									
CO6	3	1	2									

CO->PSO MAPPING - 04CH6203 - ENVIRONMENTAL CHEMISTRY

CO/PSO	PSO1	PSO2	PSO3
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CO1	2	1	2
CO2	2	1	2
CO3	3	3	2
CO4	3	3	2
CO5	3	3	2
CO6	2	1	2

COURSE->PO MAPPING - 04CH6203 - ENVIRONMENTAL CHEMISTRY

04CH6203/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2									

COURSE->PSO MAPPING - 04CH6203 - ENVIRONMENTAL CHEMISTRY

04CH6203/PSO	PSO1	PSO2	PSO3
	3	3	2

04CH6205

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6205	ENVIRONMENTAL MICROBIOLOGY	3-0-0:3	2020

No.	Course Outcome - 04CH6205 - ENVIRONMENTAL MICROBIOLOGY	Target
CO1	Understand the characteristics of different types of microorganisms and their role in various environmental applications	65%
CO2	Summarize the principle and use of various types of microscopes and to use it for examining the bacteria	65%
CO3	Summarize the bacterial growth and metabolism and the role of enzymes, bioenergetics and culture media	65%
CO4	Analyze the bacteriological quality of water and wastewater using different methods	65%
CO5	Differentiate various microbial industrial products and apply biotechnological methods for waste treatment	65%
CO6	Recognize the role of microorganisms in biogeochemical cycling and understand the principles and methods of pasteurization and sterilization	65%

COURSE END SURVEY - 04CH6205 - ENVIRONMENTAL MICROBIOLOGY

Sl.No	Questions & Options
CO1	To what extent do you understand the characteristics of different types of microorganisms and their role in various environmental applications
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO2	To what extend could you summarize the principle and use of various types of microscopes and to use it for examining the bacteria
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend could you summarize the bacterial growth and metabolism and the role of enzymes, bioenergetics and culture media
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend could you analyze the bacteriological quality of water and wastewater using different methods
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend could you differentiate various microbial industrial products and apply biotechnological methods for waste treatment
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend could you recognize the role of microorganisms in biogeochemical cycling and understand the principles and methods of pasteurization and sterilization
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6205 - ENVIRONMENTAL MICROBIOLOGY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1									
CO2	3	1	1									
CO3	1		1									
CO4	3	1	2									
CO5	3	1	2									
CO6	2		1									

CO->PSO MAPPING - 04CH6205 - ENVIRONMENTAL MICROBIOLOGY

CO/PSO	PSO1	PSO2	PSO3
CO1	3		1
CO2			1
CO3	1		1
CO4	3	2	2
CO5	3	3	2
CO6	2	2	2

COURSE->PO MAPPING - 04CH6205 - ENVIRONMENTAL MICROBIOLOGY

04CH6205/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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	3	1	2									
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COURSE->PSO MAPPING - 04CH6205 - ENVIRONMENTAL MICROBIOLOGY

04CH6205/PSO	PSO1	PSO2	PSO3
	3	3	2

04CH6207

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6207	PHYSICO-CHEMICAL TREATMENT SYSTEMS	3-0-0:3	2020

No.	Course Outcome - 04CH6207 - PHYSICO-CHEMICAL TREATMENT SYSTEMS	Target
CO1	Analyze the various water characteristics, evaluate physicochemical processes for water treatment and design sedimentation tank and filters	72%
CO2	Understand the mechanism of disinfection and the various methods, and design and analyze water distribution system	72%
CO3	Estimate the quantity and quality of wastewater, and know the effluent standards	72%
CO4	Evaluate the process kinetics and analyze various types of reactors	72%
CO5	Design various physicochemical processes for preliminary treatment of wastewater	72%
CO6	Design physicochemical processes such as aeration, precipitation, adsorption and disinfection for wastewater treatment	72%

COURSE END SURVEY - 04CH6207 - PHYSICO-CHEMICAL TREATMENT SYSTEMS

Sl.No	Questions & Options
CO1	Where you able to understand the water characteristics and basic processes involved in water treatment Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Where the concepts of disinfection and water distribution system understandable Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Where you able to understand the concepts of wastewater properties and treatment strategies Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Where the concepts of wastewater treatment kinetics understandable Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Where the concepts on process design of preliminary treatment clear Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	Where the concepts involving process design of treatment units understandable

Answer Choice- *Excellent/Very Good/Good/Satisfactory/Poor*

CO->PO MAPPING - 04CH6207 - PHYSICO-CHEMICAL TREATMENT SYSTEMS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2									
CO2	3	1	1									
CO3	3	1	2									
CO4	3	1	2									
CO5	3	1	2									
CO6	2	1	1									

CO->PSO MAPPING - 04CH6207 - PHYSICO-CHEMICAL TREATMENT SYSTEMS

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	3
CO2	3	3	2
CO3	3	3	2
CO4	3	2	2
CO5	3	2	2
CO6	2	1	1

COURSE->PO MAPPING - 04CH6207 - PHYSICO-CHEMICAL TREATMENT SYSTEMS

04CH6207/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	2									

COURSE->PSO MAPPING - 04CH6207 - PHYSICO-CHEMICAL TREATMENT SYSTEMS

04CH6207/PSO	PSO1	PSO2	PSO3
	3	3	3

04CH6209

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6209	SOLID AND HAZARDOUS WASTE MANAGEMENT	3-0-0:3	2020

No.	Course Outcome - 04CH6209 - SOLID AND HAZARDOUS WASTE MANAGEMENT	Target
CO1	Identify the sources and types of solid waste, carry out the sampling and characterization and understand the regulations	80%

CO2	Summarize the various collection, separation and processing systems for solid waste	80%
CO3	Select suitable transport, treatment, recovery and recycling options for solid waste management	70%
CO4	Design an engineered landfill with proper leachate management, and remediate existing landfills	70%
CO5	Classify different types of hazardous wastes, recognize the regulations, carry out their collection and transport, and design different treatment systems for their management	80%
CO6	Select the suitable disposal option for biomedical waste and design hazardous waste landfill	70%

COURSE END SURVEY - 04CH6209 - SOLID AND HAZARDOUS WASTE MANAGEMENT

Sl.No	Questions & Options
CO1	CO2
CO3	CO4
CO5	CO6

CO->PO MAPPING - 04CH6209 - SOLID AND HAZARDOUS WASTE MANAGEMENT

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2									
CO2	1	1	2									
CO3	3	1	1									
CO4	3	2	2									
CO5	3	1	2									
CO6	2	1	1									

CO->PSO MAPPING - 04CH6209 - SOLID AND HAZARDOUS WASTE MANAGEMENT

CO/PSO	PSO1	PSO2	PSO3
CO1	3	2	1
CO2	3	3	1
CO3	3	3	2
CO4	3	3	2
CO5	3	3	2
CO6	3	3	2

COURSE->PO MAPPING - 04CH6209 - SOLID AND HAZARDOUS WASTE MANAGEMENT

04CH6209/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2									

COURSE->PSO MAPPING - 04CH6209 - SOLID AND HAZARDOUS WASTE MANAGEMENT

04CH6209/PSO	PSO1	PSO2	PSO3
	3	3	2

04GN6001

Course Code	Course Name	L-T-P:C	Year of Introduction
04GN6001	Research Methodology	0-2-0:2	2016

No.	Course Outcome - 04GN6001 - Research Methodology	Target
CO1	To get introduced to research philosophy and processes in general.	60%
CO2	To formulate the research problem and prepare research plan	60%
CO3	Got the basic idea of IPR, copyright and patent for the social development	60%
CO4	To apply various numerical /quantitative techniques for data analysis	60%
CO5	To prepare and communicate the research findings effectively with modern tool	60%

COURSE END SURVEY - 04GN6001 - Research Methodology

Sl.No	Questions & Options
CO1	to what extent you understand what is research means and its types
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	At what confidence level you are able to formulate and prepare research problem and plan
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	what level you understand the importance of IPR Copy right and patent
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO4	at what extent you apply various numerical /quantitative techniques for data analysis
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO5	how much you are capable of preparing and communicate the research findings effectively with modern tool
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - 04GN6001 - Research Methodology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												

CO4												
CO5												

CO->PSO MAPPING - 04GN6001 - Research Methodology

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - 04GN6001 - Research Methodology

04GN6001/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04GN6001 - Research Methodology

04GN6001/PSO	PSO1	PSO2	PSO3

04CH6291

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6291	SEMINAR-I	0-0-2:2	2020

No.	Course Outcome - 04CH6291 - SEMINAR-I	Target
CO1	Ability to effectively gather and interpret information from literature survey	61%
CO2	Ability to use knowledge gathered through literature survey to identify, formulate, analyze and solve complex problems and to evaluate and interpret various solutions	61%
CO3	Gain the ability to communicate effectively with written, oral, and visual means in a technical setting.	61%
CO4	Ability to cultivate the critically analyzing the recent technological advancement in the seminar report	61%
CO5	Students will be able to present a technical topic systematically	61%
CO6	Complete an independent seminar report, resulting in at least a publication as a review in UGC approved journals and conference proceedings.	61%

COURSE END SURVEY - 04CH6291 - SEMINAR-I

Sl.No	Questions & Options
CO1	Are you able to effectively gather and interpret information from literature survey ?
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO2	To what extend you use this literature survey knowledge to identify, formulate, analyse and solve complex problems and to interpret various results ?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO3	To what extend you improved your communications skills after evaluation
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	Are u able to analyze critically the recent technological advancement in the area of Seminar
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	Are you able to present a technical topic systematically
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO6	Are u able to complete an independent seminar report with a possiibility of a publication
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6291 - SEMINAR-I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		2									
CO2	3		2									
CO3	3		2									
CO4	3		2									
CO5	1		1									
CO6	3	1	2									

CO->PSO MAPPING - 04CH6291 - SEMINAR-I

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	1
CO2	3	1	1
CO3	2	2	2
CO4	2	2	2
CO5	2	2	1
CO6	3	3	2

COURSE->PO MAPPING - 04CH6291 - SEMINAR-I

04CH6291/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	2									

COURSE->PSO MAPPING - 04CH6291 - SEMINAR-I

04CH6291/PSO	PSO1	PSO2	PSO3
	3	3	2

04CH6293

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6293	ENVIRONMENTAL ANALYSIS LAB-I	0-0-2:1	2020

No.	Course Outcome - 04CH6293 - ENVIRONMENTAL ANALYSIS LAB-I	Target
CO1	Prepare and sterilize the culture media and inoculate or streak the bacterial culture	70%
CO2	Enumerate the bacteria by using standard plate count and multiple tube fermentation test	70%
CO3	Analyze the water/wastewater sample for microbial contamination	70%
CO4	Estimate the heavy metal concentration in a water sample	70%
CO5	Measure the noise level	70%
CO6	Do air sampling and analyze the important air quality parameters	70%

COURSE END SURVEY - 04CH6293 - ENVIRONMENTAL ANALYSIS LAB-I

Sl.No	Questions & Options
CO1	Where you able to understand and operate on the procedures for culture media and bacterial culture preparation
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Where you able to Enumerate the bacteria by using standard plate count and multiple tube fermentation test
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Where you able to analyse the water/wastewater sample for microbial contamination
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Where you able to estimate the heavy metal concentration in a water sample
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Where you able to measure the noise level
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	Where you able to do air sampling and analyze the important air quality parameters
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH6293 - ENVIRONMENTAL ANALYSIS LAB-I

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	3		2									
CO2	3		2									
CO3	3		2									
CO4	3		2									
CO5	1		1									
CO6	3	1	2									

CO->PSO MAPPING - 04CH6293 - ENVIRONMENTAL ANALYSIS LAB-I

CO/PSO	PSO1	PSO2	PSO3
CO1	3	1	1
CO2	3	1	1
CO3	2	2	2
CO4	2	2	2
CO5	2	2	1
CO6	3	3	2

COURSE->PO MAPPING - 04CH6293 - ENVIRONMENTAL ANALYSIS LAB-I

04CH6293/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	2									

COURSE->PSO MAPPING - 04CH6293 - ENVIRONMENTAL ANALYSIS LAB-I

04CH6293/PSO	PSO1	PSO2	PSO3
	3	3	2

SEMESTER-2**04CH6202**

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6202	BIOLOGICAL TREATMENT SYSTEMS	4-0-0:4	2020

No.	Course Outcome - 04CH6202 - BIOLOGICAL TREATMENT SYSTEMS	Target
CO1	Understand the role of microorganisms in wastewater treatment, and the stages of bacterial growth, and types of biological treatment processes	60%
CO2	Develop the kinetics of biological treatment process, and evaluate the effect of temperature and oxygen on the process	60%

CO3	Differentiate the types of aerobic treatment systems, understand the basics of activated sludge process and process design considerations	60%
CO4	Classify the various reactors used for biological treatment of wastewater and design the reactors	60%
CO5	Familiarize the aerated lagoons and stabilisation ponds, and understand the different processes involved in sludge treatment	60%
CO6	Understand the processes involved in advanced biological treatment and evaluate the economics of the wastewater treatment process	60%

COURSE END SURVEY - 04CH6202 - BIOLOGICAL TREATMENT SYSTEMS

Sl.No	Questions & Options
CO1	To what extend are you able to understand the role of microorganisms in wastewater treatment, and the stages of bacterial growth, and types of biological treatment processes? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extend are you able to develop the kinetics of biological treatment process, and evaluate the effect of temperature and oxygen on the process? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extend are you able to differentiate the types of aerobic treatment systems, understand the basics of activated sludge process and process design considerations? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extend are you able to classify the various reactors used for biological treatment of wastewater and design the reactors? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extend are you able to familiarize the aerated lagoons and stabilisation ponds, and understand the different processes involved in sludge treatment? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extend are you able to understand the processes involved in advanced biological treatment and evaluate the economics of the wastewater treatment process? Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6202 - BIOLOGICAL TREATMENT SYSTEMS

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	3	3		3	1		1			
CO2	2	1	3			3	2					
CO3	3	1	3	2		3	1	2	1	1	1	1
CO4	3	1	3	2		3	1	2	1	1	1	1
CO5	1		3	2	1		3	2	2			1
CO6	1		3	2	1		3	2	2	1	1	1

CO->PSO MAPPING - 04CH6202 - BIOLOGICAL TREATMENT SYSTEMS

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	2
CO2	1	2	2
CO3	3	2	2
CO4	3	2	2
CO5	2	3	2
CO6	2	3	2

COURSE->PO MAPPING - 04CH6202 - BIOLOGICAL TREATMENT SYSTEMS

04CH6202/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	1	3	3	1	3	3	2	2	1	1	1

COURSE->PSO MAPPING - 04CH6202 - BIOLOGICAL TREATMENT SYSTEMS

04CH6202/PSO	PSO1	PSO2	PSO3
	3	3	2

04CH6204

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6204	AIR QUALITY MONITORING AND CONTROL	3-0-0:3	2020

No.	Course Outcome - 04CH6204 - AIR QUALITY MONITORING AND CONTROL	Target
CO1	Summarize the various sources of air pollution, types and behavior of air pollutants, and their adverse effects	60%
CO2	Evaluate the influence of various meteorologic parameters on the dispersion of air pollutants, and use mathematical modelling	60%
CO3	Carry out sampling of different types of air pollutants, analyse each pollutant	60%
CO4	Summarize the various techniques or equipment used for air pollutant control	60%
CO5	Design an electrostatic precipitator and understand other processes for air pollution control	60%
CO6	Choose the suitable control option for specific gaseous pollutants and summarize the different aspects of noise pollution	60%

COURSE END SURVEY - 04CH6204 - AIR QUALITY MONITORING AND CONTROL

Sl.No	Questions & Options
CO1	To what extent were you able to summarize the various sources of air pollution, types and behaviour of air pollutants, and their adverse effects

	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	To what extent were you able to evaluate the influence of various meteorological parameters on the dispersion of air pollutants, and use mathematical modelling
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO3	To what extent were you able to carry out sampling of different types of air pollutants, analyse each pollutant
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	To what extent were you able to summarize the various techniques or equipment used for air pollutant control
	Answer Choice- <i>Very satisfied/Satisfied/Neither satisfied nor dissatisfied/Dissatisfied /Very dissatisfied</i>
CO5	To what extent were you able to design an electrostatic precipitator and understand other processes for air pollution control
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>
CO6	To what extent were you able to choose the suitable control option for specific gaseous pollutants and summarize the different aspects of noise pollution
	Answer Choice- <i>Excellent/Very Good/Good Satisfactory/Needs improvement</i>

CO->PO MAPPING - 04CH6204 - AIR QUALITY MONITORING AND CONTROL

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	3	2	1	2	2	2	1			1
CO2	1		3	2	3		3	2	2			1
CO3	1	3	3	2	1	2	2	2	1			1
CO4	3	2	3	2	2	2	3	1	1	1	1	1
CO5	3	1	3	2	2	3	3	1		1	1	2
CO6	1	3	3	2	2	2	2	2	1			1

CO->PSO MAPPING - 04CH6204 - AIR QUALITY MONITORING AND CONTROL

CO/PSO	PSO1	PSO2	PSO3
CO1	3	3	2
CO2	2	3	2
CO3	2	3	2
CO4	3	2	2
CO5	1	3	3
CO6	2	3	2

COURSE->PO MAPPING - 04CH6204 - AIR QUALITY MONITORING AND CONTROL

04CH6204/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	2	3	3	3	2	2	1	1	2

COURSE->PSO MAPPING - 04CH6204 - AIR QUALITY MONITORING AND CONTROL

04CH6204/PSO	PSO1	PSO2	PSO3
	3	3	3

04CH6206

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6206	Environmental Impact Assessment	3-0-0:3	2020

No.	Course Outcome - 04CH6206 - Environmental Impact Assessment	Target
CO1	Recognize the various legislations pertaining to environmental protection in India and factors to be considered while measuring environmental impacts.	55%
CO2	Summarize the environmental impacts of air pollutants and noise	55%
CO3	Evaluate the water quality impacts of various projects	55%
CO4	Identify the various methods used for environmental impact assessments	55%
CO5	Recognize the considerations for energy impact analysis	55%
CO6	Perform socioeconomic impact assessment, and familiarize the case studies in EIA.	55%

COURSE END SURVEY - 04CH6206 - Environmental Impact Assessment

Sl.No	Questions & Options
CO1	Can you recognize various legislations and Acts pertaining to environmental protection in India?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Are you familiar with the environmental impacts of air and noise pollutants?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	Can you evaluate the water quality impacts of various projects?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO4	Are you able to identify the various methods used for environmental impacts?
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>
CO5	Your understanding on energy impact analysis
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
	Can you perform socioeconomic impact assessment of various developmental projects?

CO6

Answer Choice- *Always/Very often/Sometimes/Rarely/Never***CO->PO MAPPING - 04CH6206 - Environmental Impact Assessment**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		2			3	2	2	1	1	2
CO2	2											1
CO3			2		1							1
CO4		2										1
CO5								3				
CO6	2	2	2		1		1	2	1	1	1	1

CO->PSO MAPPING - 04CH6206 - Environmental Impact Assessment

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - 04CH6206 - Environmental Impact Assessment

04CH6206/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	2	2	2	1		3	3	2	1	1	2

COURSE->PSO MAPPING - 04CH6206 - Environmental Impact Assessment

04CH6206/PSO	PSO1	PSO2	PSO3

04CH6214

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6214	SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY	3-0-0:3	2020

No.	Course Outcome - 04CH6214 - SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY	Target
CO1	Summarize the history of sustainable development and its various dimensions	60%
CO2	Understand the sustainability framework and assess the sustainability	60%

CO3	Summarize the major global issues	60%
CO4	Understand the concept of carbon trading and recognize the related international summits and conventions	60%
CO5	Identify sources and types of renewable energy technologies	60%
CO6	Evaluate various environmental biotechnological applications	60%

COURSE END SURVEY - 04CH6214 - SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY

Sl.No	Questions & Options
CO1	Whether able to summarize history of sustainable development and its various dimensions?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Whether able to understand the sustainability framework and assess the sustainability?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Whether able to summarize the major global environmental issues?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Whether able to understand the concept of carbon trading and recognize the related international summits?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Whether able to identify the sources and types of renewable energy technologies?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	Whether able to evaluate various environmental biotechnological applications?
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH6214 - SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		2						3	1			1
CO2		2		1	3		1	3	1			1
CO3		3					1	1				
CO4	1	2	3	3	1		2	3	1	1	1	2
CO5	1	3	3	2	1	2	2	2	1			
CO6	1	1	2		1		2	2	1	1	1	1

CO->PSO MAPPING - 04CH6214 - SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	1
CO2	2	1	1

CO3	3		1
CO4	3		2
CO5	3	3	2
CO6	3		1

COURSE->PO MAPPING - 04CH6214 - SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY

04CH6214/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	1	3	3	3	3	2	2	3	1	1	1	2

COURSE->PSO MAPPING - 04CH6214 - SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOGY

04CH6214/PSO	PSO1	PSO2	PSO3
	3	3	2

04CH6216

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6216	Environmental Nanotechnology	3-0-0:3	2020

No.	Course Outcome - 04CH6216 - Environmental Nanotechnology	Target
CO1	Summarize the physico- chemical and biological approaches for nanomaterial synthesis	60%
CO2	Synthesize nanobiocomposites, and evaluate the nano pollution of various environmental media	60%
CO3	Summarize the different nanomaterials used for environmental remediation	60%
CO4	Apply nanofiltration for water and wastewater treatment	60%
CO5	Employ nanotechnology for treatment of industrial waste and evaluate the health impact and toxicity of nanomaterials	60%
CO6	Assess the possible ecotoxicological effect of nanoparticles and the future of nanomaterials	60%

COURSE END SURVEY - 04CH6216 - Environmental Nanotechnology

Sl.No	Questions & Options
CO1	Where you able to Summarize the physico- chemical and biological approaches for nanomaterial synthesis
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO2	Where you able to understand nanocomposite synthesis, and evaluate the nano pollution of various environmental media
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO3	Where you able to Summarize the different nanomaterials used for environmental remediation

	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO4	Where you able to understand the application of nanofiltration for water and wastewater treatment
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO5	Where you able to Employ nanotechnology for treatment of industrial waste and evaluate the health impact and toxicity of nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>
CO6	Where you able to Employ nanotechnology for treatment of industrial waste and evaluate the health impact and toxicity of nanomaterials
	Answer Choice- <i>Excellent/Very Good/Good/Satisfactory/Poor</i>

CO->PO MAPPING - 04CH6216 - Environmental Nanotechnology

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1		2	2	2	3	1	1	1
CO2	3	2	3	1	2	3	3	1	2			1
CO3	2	2	2	1		2	2	2	3	1	1	1
CO4	3	2	3	2	1	3	3	2	3			1
CO5	3	3	3	3	2	3	3	3	3	3	3	3
CO6	1	2	1	3			2	2			1	1

CO->PSO MAPPING - 04CH6216 - Environmental Nanotechnology

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - 04CH6216 - Environmental Nanotechnology

04CH6216/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2	3	3	3	3	3	3	3

COURSE->PSO MAPPING - 04CH6216 - Environmental Nanotechnology

04CH6216/PSO	PSO1	PSO2	PSO3

04CH6292

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6292	Design Project	0-0-4:2	2020

No.	Course Outcome - 04CH6292 - Design Project	Target
CO1	Learn the design approaches of treatment systems for water/wastewater/solid waste/air /noise pollution	60%
CO2	Identify a relevant environmental engineering design problem	60%
CO3	Carry out complete design of a particular treatment system for environmental pollution control	60%
CO4	Develop the complete design with calculations, detailed drawings, and estimation of quantities	60%
CO5	Ability to design (independently or in a team) suitable treatment systems for control of environmental pollution	60%
CO6	Develop better communication and presentation skills	60%

COURSE END SURVEY - 04CH6292 - Design Project

Sl.No	Questions & Options
CO1	To what extent are you able to learn the design approaches of treatment systems for water/wastewater/solid waste/air /noise pollution?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to identify a relevant environmental engineering design problem?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to carry out complete design of a particular treatment system for environmental pollution control?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to develop the complete design with calculations, detailed drawings, and estimation of quantities?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to design (independently or in a team) suitable treatment systems for control of environmental pollution?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent are you able to develop better communication and presentation skills?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6292 - Design Project

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	3	3	3	1	3	3	3	1	3	1		3
CO2	3	3	3	1	3	3	3	1	3	1		3
CO3	3	3	3	1	3	3	3	1	3	1		3
CO4	3	3	3	1	3	3	3	1	3	1		3
CO5	3	3	3	1	3	3	3	1	3	1		3
CO6	3	3	3	1	3	3	3	1	3	1		3

CO->PSO MAPPING - 04CH6292 - Design Project

CO/PSO	PSO1	PSO2	PSO3
CO1	1	3	3
CO2	1	3	3
CO3	1	3	3
CO4	1	3	3
CO5	1	3	3
CO6	1	3	3

COURSE->PO MAPPING - 04CH6292 - Design Project

04CH6292/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	3	3	3	1	3	1		3

COURSE->PSO MAPPING - 04CH6292 - Design Project

04CH6292/PSO	PSO1	PSO2	PSO3
	1	3	3

04CH6294

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH6294	ENVIRONMENTAL ANALYSIS LAB-II	0-0-2:1	2020

No.	Course Outcome - 04CH6294 - ENVIRONMENTAL ANALYSIS LAB-II	Target
CO1	Carry out grab and composite sampling for water and wastewater analysis	60%
CO2	Analyze the physical characteristics of water/wastewater such as solids, turbidity and electrical conductivity	60%
CO3	Determine the concentration of various ions present in the water sample	60%
CO4	Analyze the BOD of wastewater sample	60%

CO5	Analyze the COD of wastewater sample	60%
CO6	Estimate the organic content, chloride, sulphate, pH and conductivity of soil sample	60%

COURSE END SURVEY - 04CH6294 - ENVIRONMENTAL ANALYSIS LAB-II

Sl.No	Questions & Options
CO1	To what extent are you able to carry out grab and composite sampling for water and wastewater analysis?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO2	To what extent are you able to analyze the physical characteristics of water/wastewater such as solids, turbidity and electrical conductivity?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO3	To what extent are you able to determine the concentration of various ions present in the water sample?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO4	To what extent are you able to analyze the BOD of wastewater sample?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	To what extent are you able to analyze the COD of wastewater sample?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	To what extent are you able to estimate the organic content, chloride, sulphate, pH and conductivity of soil sample?
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>

CO->PO MAPPING - 04CH6294 - ENVIRONMENTAL ANALYSIS LAB-II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1	2	3	1		2			1
CO2	2	2	3		1	3	1		2			1
CO3	2	2	3		1	3	1		2			1
CO4	2	2	3		1	3	1		2			1
CO5	2	2	3		1	3	1		2			1
CO6	2	2	3		1	3	1		2			1

CO->PSO MAPPING - 04CH6294 - ENVIRONMENTAL ANALYSIS LAB-II

CO/PSO	PSO1	PSO2	PSO3
CO1	1	3	3
CO2		3	3
CO3		3	3

CO4		3	3
CO5		3	3
CO6		3	3

COURSE->PO MAPPING - 04CH6294 - ENVIRONMENTAL ANALYSIS LAB-II

04CH6294/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	1	2	3	1		2			1

COURSE->PSO MAPPING - 04CH6294 - ENVIRONMENTAL ANALYSIS LAB-II

04CH6294/PSO	PSO1	PSO2	PSO3
	1	3	3

SEMESTER-3**04CH7203**

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7203	ENVIRONMENTAL GEOTECHNOLOGY	3-0-0:3	2020

No.	Course Outcome - 04CH7203 - ENVIRONMENTAL GEOTECHNOLOGY	Target
CO1	Classify the different soil pollutants, and identify the factors affecting behavior of pollutants in soil	60%
CO2	Evaluate the site selection, characterization and stability of landfills, and understand the different mechanisms involved in waste stabilization	60%
CO3	Understand the various processes affecting contaminant transport in sub surface, ways to protect aquifers from pollution	60%
CO4	Characterize the contaminated soil for engineering purposes	60%
CO5	Choose suitable technology for remediation of contaminated sites	60%
CO6	Familiarize the advanced methods in environmental geotechnology	60%

COURSE END SURVEY - 04CH7203 - ENVIRONMENTAL GEOTECHNOLOGY

Sl.No	Questions & Options
CO1	CO2
CO3	CO4
CO5	CO6

CO->PO MAPPING - 04CH7203 - ENVIRONMENTAL GEOTECHNOLOGY

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	2	1	2	3	2	3	3	1				1
CO2	2		1	3	3	2	3	1				2
CO3	2		1	3	3	2	3	1				2
CO4	2		1	3	3	2	3	1				2
CO5	2		1	3	3	2	3	1				1
CO6	2		1	3	3	2	3	1				1

CO->PSO MAPPING - 04CH7203 - ENVIRONMENTAL GEOTECHNOLOGY

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

COURSE->PO MAPPING - 04CH7203 - ENVIRONMENTAL GEOTECHNOLOGY

04CH7203/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2	1	2	3	3	3	3	1				2

COURSE->PSO MAPPING - 04CH7203 - ENVIRONMENTAL GEOTECHNOLOGY

04CH7203/PSO	PSO1	PSO2	PSO3

04CH7291

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7291	SEMINAR-II	0-0-2:2	2020

No.	Course Outcome - 04CH7291 - SEMINAR-II	Target
CO1	Acquire knowledge on latest developments on a specific area of interest	60%
CO2	Logically connect the works done by different authors in the same area	60%
CO3	Understand the gaps in literature on a specific topic	60%
CO4	Identify research works that could be done in the immediate future	60%
CO5	Write report and make presentations on the area studied	60%

COURSE END SURVEY - 04CH7291 - SEMINAR-II

Sl.No	Questions & Options
CO1	To what extent could you acquire knowledge on latest developments on a specific area of interest
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	To what extent could you logically connect the works done by different authors in the same area
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO3	To what extent could you understand the gaps in literature on a specific topic
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	To what extent could you identify research works that could be done in the immediate future
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO5	To what extent could you write report and make presentations on the area studied
	Answer Choice- <i>5 out of 5/4 out of 5/3 out of 5/2 out of 5/1 out of 5</i>

CO->PO MAPPING - 04CH7291 - SEMINAR-II

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

CO->PSO MAPPING - 04CH7291 - SEMINAR-II

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - 04CH7291 - SEMINAR-II

04CH7291/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH7291 - SEMINAR-II

04CH7291/PSO	PSO1	PSO2	PSO3

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04CH7293

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7293	PROJECT (PHASE-I)	0-0-12:6	2020

No.	Course Outcome - 04CH7293 - PROJECT (PHASE-I)	Target
CO1	Review literature to find feasible solutions for a problem	60%
CO2	Systematically analyse a problem and develop objective statements	60%
CO3	Develop a scientific method to reach an objective	60%
CO4	Communicate and convince others on the method of achieving an objective	60%
CO5	Properly document a work plan/work report	60%

COURSE END SURVEY - 04CH7293 - PROJECT (PHASE-I)

Sl.No	Questions & Options
CO1	To what extent are you capable to review literature to find feasible solutions for a problem?
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO2	To what extent are you capable to systematically analyse a problem and develop objective statements
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO3	To what extent are you capable to develop a scientific method to reach an objective
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>
CO4	To what extent are you capable to communicate and convince others on the method of achieving an objective
	Answer Choice- <i>Very high degree/High Degree/Moderate degree/Small Degree/Not at all</i>
CO5	To what extent are you capable to properly document a work plan / report
	Answer Choice- <i>Very advanced/Advanced/Proficient/Basic/ Minimal</i>

CO->PO MAPPING - 04CH7293 - PROJECT (PHASE-I)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												

CO5												
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CO->PSO MAPPING - 04CH7293 - PROJECT (PHASE-I)

CO/PSO	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE->PO MAPPING - 04CH7293 - PROJECT (PHASE-I)

04CH7293/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

COURSE->PSO MAPPING - 04CH7293 - PROJECT (PHASE-I)

04CH7293/PSO	PSO1	PSO2	PSO3

04CH7213

Course Code	Course Name	L-T-P:C	Year of Introduction
04CH7213	LIFECYCLE ASSESMENT	3-0-0:3	2020

No.	Course Outcome - 04CH7213 - LIFECYCLE ASSESMENT	Target
CO1	To provide the student with knowledge about a framework for evaluation of the environmental footprint of various systems and technologies.	65%
CO2	To provide the student with knowledge about qualitative and quantitative methods for LCA	65%
CO3	To provide the student with knowledge about mathematical structure of LCA and modeling of Production Systems	65%
CO4	To Apply Life Cycle Assessment on various energy, product and transport technologies and systems.	65%
CO5	To Perform Robust Assessments of the Environmental Characteristics of Systems	65%
CO6	To Assess the Environmental Performance of Energy and Production Systems	65%

COURSE END SURVEY - 04CH7213 - LIFECYCLE ASSESMENT

Sl.No	Questions & Options
CO1	Will you be able to evaluate the environmental footprint of various systems
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>

CO2	Will you be able to select the appropriate LCA method
	Answer Choice- <i>Always/Very often/Sometimes/Rarely/Never</i>
CO3	Do you agree that you can model a production system
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>
CO4	What is your understanding on application of LCA on energy products
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO5	What is your confidence in carrying out assessments
	Answer Choice- <i>Excellent/Very Good/Good/Fair/Poor</i>
CO6	Do you agree that you can assess Energy and Production Systems
	Answer Choice- <i>Strongly Agree/Agree/Neutral Disagree/Strongly disagree</i>

CO->PO MAPPING - 04CH7213 - LIFECYCLE ASSESMENT

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	3	1	1	2	2	1	1	1	2
CO2	3	1	2	3	1	1	2	1	1	1		1
CO3	2	1	2	3	2	1	2	1	1	1		1
CO4	3	3	3	3	1	1	2	1	2	1		2
CO5	3	3	3	3	1	1	1	1	2	1		1
CO6	3	2	3	3	1	1	1	1	2	1	1	1

CO->PSO MAPPING - 04CH7213 - LIFECYCLE ASSESMENT

CO/PSO	PSO1	PSO2	PSO3
CO1	1	1	1
CO2	1	2	1
CO3	1	2	2
CO4	1	1	3
CO5	1	2	3
CO6	1	2	3

COURSE->PO MAPPING - 04CH7213 - LIFECYCLE ASSESMENT

04CH7213/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	3	3	3	3	2	1	2	2	2	1	1	2

COURSE->PSO MAPPING - 04CH7213 - LIFECYCLE ASSESMENT

04CH7213/PSO	PSO1	PSO2	PSO3
	1	2	3

PhD-PHD CH

CONTINUOUS IMPROVEMENT IMPLEMENTED

Measures identified & Implemented Via AddOn, Bridge, MOOC, Conference, Workshop, Internship & Project

No	Course	Type
1	Honours Course-S4	Honours Course
2	Honour's Course-S6	Honours Course
3	S7 CHEMICAL HONOURS	Honours Course
4	Bioprocess Engineering	Honours Course
5	COMPOSITE MATERIALS	Honours Course
6	S5 Chemical Honours	Honours Course
7	S7 CH	Honours Course
8	Process Integration	Honours Course
9	Safety Engineering of Process Plants	Minor Course

Honours Course-S4

Type:	Honours Course
Details	Honours Course S4-chemical Engineering
Mode of Instruction:	Fully Online Instruction, Lecture
Staff(s) Associated	Dr. J R Anoop Raj Dr. David K Daniel
Course(s) Associated	CHT294 - INSTRUMENTAL METHODS FOR ENVIRONMENTAL ENGINEERING

Honour's Course-S6

Type:	Honours Course
Details	One Elective which is not offered to regular students of ChE from the Elective list in the 6TH Semester ChE curriculum is offered for the B. Tech. Honour's Students
Mode of Instruction:	Fully Online Instruction, Lecture
Staff(s) Associated	Dr. J R Anoop Raj Dr. David K Daniel
Course(s) Associated	CH374 - Process Design for Pollution Control

S7 CHEMICAL HONOURS

Type:	Honours Course
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Details	Enzyme Engineering (CH463)
Mode of Instruction:	Fully Online Instruction, Online Live Class, Online Resources
Staff(s) Associated	Dr. David K Daniel
Course(s) Associated	CH463 - Enzyme Engineering

Bioprocess Engineering

Type:	Honours Course
Details	S6 Chemical Engineering
Mode of Instruction:	Discussion, Lecture, Question and Answer, Seminar
Staff(s) Associated	Dr. Vishnu M
Course(s) Associated	CH364 - Bioprocess Engineering

COMPOSITE MATERIALS

Type:	Honours Course
Details	Course Objective To impart the basic concepts of composite materials
Mode of Instruction:	Computer Aided Presentation, Direct Instruction, Discussion, Examination, Fully Online Instruction, Group Activities, Lecture, Self learning
Staff(s) Associated	Rijin M D Tom
Course(s) Associated	CH466 - Composite Materials

S5 Chemical Honours

Type:	Honours Course
Details	M.Tech Elective O4CH7101 - Self-assembling nanostructured molecular materials and devices
Mode of Instruction:	Discussion, Lecture, Question and Answer, Self learning
Staff(s) Associated	Dr. Abhinav K Nair
Course(s) Associated	04CH7101 - Self Assembling nanostructured molecular materials and devices

S7 CH

Type:	Honours Course
Details	Honours Course

Mode of Instruction:	Lecture
Staff(s) Associated	Dr. David K Daniel Rana Prathapan A.D
Course(s) Associated	CH463 - Enzyme Engineering

Process Integration

Type:	Honours Course
Details	S8 Honours
Mode of Instruction:	Lecture
Staff(s) Associated	Dr. Kusumita Dutta
Course(s) Associated	CH472 - Process Integration

Safety Engineering of Process Plants

Type:	Minor Course
Details	Safety Engineering of Process Plants
Mode of Instruction:	
Staff(s) Associated	Rijin M D Tom
Course(s) Associated	CHT282 - Safety Engineering of Process Plants