



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

Approved by AICTE, Affiliated to Anna University
363, Arcot Road, Kodambakkam Chennai-24, Tamil Nadu
Email Id : principal@msec.edu.in
Website : www.msec.edu.in

INDEX

SI NO.	CONTENTS	PAGE NO
1.	SUMMARY	1
2.	PROGRAM OUTCOMES – COMMON	3
3.	PROGRAM SPECIFIC OUTCOMES	
	CIVIL ENGINEERING - UG	4
	COMPUTER SCIENCE ENGINEERING -UG	5
	ELECTRONICS COMMUNICATION ENGINEERING -UG	6
	ELECTRICAL AND ELECTRONICS ENGINEERING -UG	7
	INFORMATION TECHNOLOGY -UG	8
	MECHANICAL ENGINEERING -UG	9
	CONSTRUCTION ENGINEERING AND MANAGEMENT -PG	10
4.	COURSE OUTCOME (R 2013)	
	• DEPARTMENT OF HUMANITIES & SCIENCE	11-41
	• CIVIL ENGINEERING - UG	41-56
	• COMPUTER SCIENCE ENGINEERING -UG	57-71
	• ELECTRONICS COMMUNICATION ENGINEERING -UG	72-88
	• ELECTRICAL AND ELECTRONICS ENGINEERING -UG	89-101
	• INFORMATION TECHNOLOGY -UG	102-113
	• MECHANICAL ENGINEERING -UG	114-130
	• CONSTRUCTION ENGINEERING AND MANAGEMENT -PG	131-138
5.	COURSE OUTCOME (R 2017)	
	• DEPARTMENT OF HUMANITIES & SCIENCE	139-165
	• CIVIL ENGINEERING - UG	166-180
	• COMPUTER SCIENCE ENGINEERING -UG	181-195
	• ELECTRONICS COMMUNICATION ENGINEERING -UG	196-212
	• ELECTRICAL AND ELECTRONICS ENGINEERING -UG	213-227
	• INFORMATION TECHNOLOGY -UG	228-239
	• MECHANICAL ENGINEERING -UG	240-255
	• CONSTRUCTION ENGINEERING AND MANAGEMENT -PG	256-264



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2.6.1 Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students

- The Institute provides a high-quality, all-encompassing education. The aim and mission of the Institute is to provide a conducive learning environment that helps the students to attain professional and personal growth in technical area.
- The effectiveness of the teaching learning process can be measured through learning outcomes and in turn, it can be achieved by mapping the **Course Outcomes (CO)** with **Programme Outcomes (PO)** and **Program Specific Outcomes (PSO)**.
- Program Educational Objectives (PEO), and Program Specific Outcomes (PSO) are clearly stated and displayed in each department's classrooms, corridors, faculty rooms, laboratories, as well as on the departmental webpage of the Institutional website (www.msec.edu.in)
- All the students are apprised of the objectives and expected outcomes of their programme during the compulsory Orientation program. Students are also educated and provided with the detailed syllabus and course outcomes in each course and the assessment strategy for each course. The course outcomes are displayed in departmental web page of institutional website.

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Electrical and Electronics Engine x +

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M1: To achieve eminence in the field of Electrical and Electronics Engineering.
M2: To encourage research capabilities and professional applications.
M3: To inculcate moral values and professional ethics.

Program Educational Objectives (PEOs):

PEO1: Provide adequate knowledge to analyse power electronics & drives, power systems and work with inter-disciplinary groups.
PEO2: Develop skills needed to work on computational platform and software applications.
PEO3: Encourage and acquire the ability to design, analyse and build electrical and electronics systems.
PEO4: Promote managerial skills and inculcate professional ethics.

Program Specific Outcomes (PSOs):

PSO1: Able to apply the mathematical and basic sciences knowledge in order to identify, formulate and solve real-time issues and challenges in the industries.
PSO2: To impart innovation among engineers to work in the emerging technologies.

Course Outcomes
Click for 2017 Regulation
Click for 2013 Regulation

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14:54
27-05-2022

Website Screenshot of Course Outcomes, PEOs and PSOs


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Program Outcomes

- PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3. Design/development of solutions:** 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. Conduct investigations of complex problems:** 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. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** 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. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10. Communication:** 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. Project management and finance:** 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. Life-long learning:** 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.

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DEPARTMENT OF CIVIL ENGINEERING

Program specific objectives

- **PSO1:** Able to apply the engineering fundamentals to analyze and design various Civil Engineering Structures.
- **PSO2:** Catering to the changing industrial needs and adapting green concepts for different applications.
- **PSO3:** Understand the civil engineering solutions in the social context

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(HOD, CIVIL)



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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

Program Specific Outcomes (PSOs)

- **PSO1:** Ability to identify, analyse, design and implement computer based system of varying complexities.
- **PSO2:** To apply hardware/software methods, open ended programming environments and available tools in emerging technologies for solving real-life and R&D problems
- **PSO3:** Employing engineering solution for ground-breaking career paths, to become leading entrepreneur and develop interest for further studies


(HOD, (SE))


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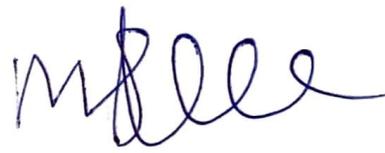


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Program Specific Outcomes (PSOs):

- **PSO1:** Able to apply the mathematical and basic science knowledge in order to identify, formulate and solve real-time issues and challenges in the industries.
- **PSO2:** To impart innovation among engineers to meet technological evolution.


(Mrs. SOUNDAMA BALA. S)
(HOD, EEE)



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Program Specific Outcomes

- **PSO1:** Demonstrate principles of basic electronic circuits, digital electronics, microprocessor and signal processing.
- **PSO2:** Design systems for applications in the areas of communication, networking and embedded systems.
- **PSO3:** Design low cost quality, energy efficient and eco-friendly products.


(HOD, ECE)


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DEPARTMENT OF MECHANICAL ENGINEERING

- **PSO1:** Application of core subjects namely, Design, Manufacturing, Thermal Engineering and Fluid Mechanics to Mechanical engineering Problems
- **PSO2:** Familiarization of modern Design and Analytical software such as AutoCAD, CREO, NASTRAN, ADAMS, CADEM, FluidSim, Lab view and MATLAB for analysing problems of Mechanical Engineering
- **PSO3:** Incorporate design and implementation of mechanical systems in societal and environmental issues


(HOD, ME)



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DEPARTMENT OF INFORMATION TECHNOLOGY

Program Specific Objectives (PSOs)

PSO 1: Apply basic engineering knowledge in analysing and devising optimal solutions for various problems in business enterprise.

PSO 2: Provide socially acceptable technical solutions to complex IT engineering problems.

PSO 3: Gain knowledge of ethical and management principles required to work and lead a team.

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Dr. Arkan M. H.
(HOD, IT)



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DEPARTMENT OF CIVIL ENGINEERING

MASTERS OF ENGINEERING IN CONSTRUCTION ENGINEERING AND MANAGEMENT

PROGRAM SPECIFIC OUTCOMES

- **PSO1:** Able to implement tools and techniques in optimizing engineering problems.
- **PSO2:** Catering to changing industrial needs of the evolving project life cycle.
- **PSO3:** Understanding the scope in all aspects of management in construction industry.


(DEAN, PG STUDIES, HOD)


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DEPARTMENT OF HUMANITIES AND SCIENCE (B.E. CIVIL ENGINEERING)

REGULATION – 2013 COURSE OUTCOMES (CO)

HS6151-Technical English-I - [C101]

C101.1	Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
C101.2	Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topics.
C101.3	Read different genres of texts adopting various reading strategies
C101.4	Listen/view and comprehend different spoken discourses/excerpts in different accents.
C101.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA6151-Mathematics-I [C102]

C102.1	To find eigenvalues, eigenvectors, canonical form and inverse of a matrix.
C102.2	Acquire the knowledge of infinite and finite series and their convergence.
C102.3	Evaluate radius of curvature, evolute and envelope of given curves using differential calculus.
C102.4	Examine the concepts of functions of several variables and to find extremum value of a given function.
C102.5	Develop an ability to trace the curve and find area , volume using multiple integrals.

PH6151-Engineering Physics-I [C103]

C103.1	Basics of crystals and their properties and applications in fields of engineering.
C103.2	Basics of physics related to properties of matter, and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.
C103.3	Concept of sound production and application in the field of construction
C103.4	Dual nature of matter and its applications
C103.5	Production of laser and optical fibres. Their uses in communications.


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DEPARTMENT OF HUMANITIES AND SCIENCE (B.E. CIVIL ENGINEERING)

CY6151 -Engineering Chemistry – I (C104)

C104.1	Understand the Principles of polymer chemistry and engineering applications of polymers.
C104.2	Understand the basic concepts of , thermodynamics and their importance.
C104.3	Know the basic concepts of Analytical techniques and their importance.
C104.4	Understand knowledge in Industrial importance of Phase rule and alloys.
C104.5	Know the concept of nanomaterials and its applications

GE6151-Computer Programming-[C105]

C105.1	Explain the basic organization of computers, the number systems and write the pseudo code for algorithms and flow chart.
C105.2	Develop C programming fundamentals, looping statements and solve problems
C105.3	Develop C programs for arrays and strings
C105.4	Use functions with pass by value and reference, pointers in programs
C105.5	Develop codings in C for structures and unions with storage classes and preprocessor

GE6152- Engineering Graphics [C106]

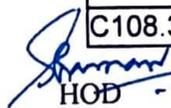
C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.2	Draw orthographic projections of lines and plane surfaces.
C106.3	Draw projections of solids
C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.

GE6161 – Computer Practices Laboratory – (C107)

C107.1	Develop C programs for simple applications making use of basic constructs, arrays function, recursion, pointers, structures and strings
C107.2	Design applications using sequential and random access file processing
C107.3	Develop C programs involving structures union.

GE6162 – Engineering Practices Laboratory – (C108)

C108.1	Study and practice on machine tools and their operations
C108.2	Practice on carpentry tools, components and pipe connections including plumbing work
C108.3	Demonstrate wiring for a simple residential house, identify the ratings of


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DEPARTMENT OF HUMANITIES AND SCIENCE (B.E. CIVIL ENGINEERING)

	various appliances like Fluorescent tube, incandescent lamp, etc.
C108.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C108.5	Analyze the characteristics of basic electronic devices
C108.6	Elaborate on the components, gates, soldering practices

GE6163 - Physics and Chemistry Laboratory – I (C109)

C109.1	The hands on exercises undergone by the students will help them to apply physics principles of optics.
C109.2	Gain knowledge about thermal physics to evaluate engineering properties of materials.
C109.3	Outfitted with hands-on knowledge in the quantitative chemical analysis of polymer and acid based related parameters.
C109.4	Basic idea about pH and conductometric titration.

HS6251-Technical English-II [C110]

C110.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative.
C110.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C110.3	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
C110.4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
C110.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA6251-Mathematics-II - [C111]

C111.1	Estimate vector identities and interpret some integral theorems in a vector field.
C111.2	Develop an ability to solve ordinary differential equations.
C111.3	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions..
C111.4	Identify and construct analytic function and application of conformal mapping.
C111.5	Apply complex integration to evaluate contour integrals.

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PH6251 – Engineering Physics–II – [C112]

C112.1	Conducting materials using wave mechanics.
C112.2	Semiconducting materials and their application in engineering field.
C112.3	Properties of magnetic and superconducting materials.
C112.4	Significance of dielectric and its application in the field of engineering.
C112.5	Upcoming new engineering materials and their applications in engineering fields.

CY6251 – Engineering Chemistry –II – [C113]

C113.1	Understand water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C113.2	Gain knowledge about with the principles electrochemistry, electrochemical cells, emf and applications of emf measurements.
C113.3	Gain basic knowledge in Principles of corrosion control.
C113.4	Understand fundamental concepts of Fuels and combustion
C113.5	Acquire knowledge in various energy sources and its applications.

GE6262- Basic Electrical and Electronics Engineering- [C114]

C114.1	Able to understand the basic theorems used in electrical circuits and the different componenets.
C114.2	Able to understand the principle of operation, construction and working function of electrical machines.
C114.3	Ability to understand electronics componenets operation, characteristics and its applications.
C114.4	Able to understand the design, principles of digital electronics circuits.
C114.5	Able to impart the knowledge of various communication systems.

GE6253 - Engineering Mechanics - [C115]

C115.1	Enumerate the basic concepts of particle mechanics and solve problems
C115.2	Enumerate the basic of concepts of rigid body under static equilibrium and solve problems
C115.3	Determine the centroid of a line, areas, and volumes, center of mass of body and moment of inertia of composite areas
C115.4	Solve problems involving kinematics and kinetics of particles
C115.5	Solve problems involving kinetics of rigid bodies with and without friction


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**DEPARTMENT OF HUMANITIES AND SCIENCE
(B.E. CIVIL ENGINEERING)**

GE6261 – Computer Aided Drafting and Modeling Laboratory-[C116]

At the end of the course, the student will be able to

C116.1	Ability to design various structures using AutoCAD
C116.2	Ability to draw the detailing of the structures using various commands
C116.3	The students get knowledge about the different types of roof finishes
C116.4	The students get knowledge about the 3D modeling of the structures.
C116.5	Ability to get knowledge about the drafting of the structures in a easy way.

GE6262 - Physics and Chemistry Laboratory – II-[C117]

C117.1	Ability to test materials by using their knowledge of applied physics principles in optics and properties of matter..
C117.2	Assess the behaviour of columns, beams and failures of materials
C117.3	Conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters
C117.4	Gain good knowledge about corrosion measurement


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C109.3	Outfitted with hands-on knowledge in the quantitative chemical analysis of polymer and acid based related parameters.
C109.4	Basic idea about pH and conductometric titration.

HS6251- Technical English - II [C110]

C110.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative.
C110.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C110.3	Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation.
C110.4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
C110.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.


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363, ARCOT ROAD, KODAMBAKKAM,
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DEPARTMENT OF HUMANITIES AND SCIENCE
(BE COMPUTER SCIENCE AND ENGINEERING)

MA6251- Mathematics-II [C111]

C111.1	Estimate vector identities and interpret some integral theorems in a vector field.
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C111.3	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions.
C111.4	Identify and construct analytic function and application of conformal mapping.
C111.5	Apply complex integration to evaluate contour integrals.

PH6251- Engineering Physics - II [C112]

C112.1	Conducting materials using wave mechanics.
C112.2	Semiconducting materials and their application in engineering field.
C112.3	Properties of magnetic and superconducting materials.
C112.4	Significance of dielectric and its application in the field of engineering.
C112.5	Upcoming new engineering materials and their applications in engineering fields.

CY6251- Engineering Chemistry-II [C113]

C113.1	Understand water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C113.2	Gain knowledge about with the principles electrochemistry, electrochemical cells, emf and applications of emf measurements.
C113.3	Gain basic knowledge in Principles of corrosion control.
C113.4	Understand fundamental concepts of Fuels and combustion
C113.5	Acquire knowledge in various energy sources and its applications.

CS6201-Digital Principles And System Design [C114]

C114.1	To understand different methods used for the simplification of Boolean functions
C114.2	To understand and design a system that uses combinational logic for the given specification. Simulate combinational logic systems using verilog or VHDL


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C114.3	To understand and design synchronous sequential system for the given specification. Simulate sequential logic systems using verilog or VHDL
C114.4	To design and implement Asynchronous sequential system for the given specification
C114.5	To design and implement memory accessing systems and systems using PLA, PAL

CS6202 –Programming and Data Structures –I [C115]

C115.1	Develop Programs using functions and Pointers
C115.2	Explain the File handling concept in C language.
C115.3	Discuss about the various Linear Data Structure Operations and applications using ADT.
C115.4	Explain the various algorithms for sorting and searching
C115.5	Demonstrate the indexing techniques in data structures.

GE6262 - Physics & Chemistry laboratory-II [C116]

C116.1	Ability to test materials by using their knowledge of applied physics principles in optics and properties of matter..
C116.2	Assess the behaviour of columns, beams and failures of materials
C116.3	Conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters
C116.4	Gain good knowledge about corrosion measurement

CS 6211 Digital Laboratory [C117]

C117.1	Analyse the characteristics of logic gates
C117.2	Elaborate on the components , gates, code converters.
C117.3	Analyse,design and implement sequential logic circuits


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CS6212– Programming and Data Structures Laboratory I – [C118]

C118.1	Develop simple C Programs using pointers and Functions
C118.2	Develop C program for Linear data structure operations and File Manipulation concepts.
C118.3	Develop programs using various sorting algorithms and searching methods.


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REGULATION – 2013

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MA6151 – Mathematics I [C102]

C102.1	To find eigenvalues, eigenvectors, canonical form and inverse of a matrix
C102.2	Acquire the knowledge of infinite and finite series and their convergence.
C102.3	Evaluate radius of curvature, evolute and envelope of given curves using differential calculus.
C102.4	Examine the concepts of functions of several variables and to find extremum value of a given function.
C102.5	Develop an ability to trace the curve and find area , volume using multiple integrals.

PH6151 – Engineering Physics I [C103]

C103.1	Basics of crystals and their properties and applications in fields of engineering
C103.2	Basics of physics related to properties of matter, and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.
C103.3	Concept of sound production and application in the field of construction.
C103.4	Dual nature of matter and its applications.
C103.5	Production of laser and optical fibres, their uses in communications.

CY6151 – Engineering Chemistry I [C104]

C104.1	Understand the Principles of polymer chemistry and engineering applications of Polymers.
C104.2	Understand the basic concepts of , thermodynamics and their importance.
C104.3	Know the basic concepts of Analytical techniques and their importance.
C104.4	Understand knowledge in Industrial importance of Phase rule and alloys.
C104.5	Know the concept of nanomaterials and its applications.


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C105.4	Use functions with pass by value and reference, pointers in programs.
C105.5	Develop codings in C for structures and unions with storage classes and preprocessor.

GE6152 – Engineering Graphics [C106]

C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.2	Draw orthographic projections of lines and plane surfaces.
C106.3	Draw projections of solids.
C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.

GE6161 – Computer Practices Laboratory [C107]

C107.1	Develop C programs for simple applications making use of basic constructs, arrays function, recursion, pointers, structures and strings.
C107.2	Design applications using sequential and random access file processing.
C107.3	Develop C programs involving structures union.

GE6162 – Engineering Practices Laboratory [C108]

C108.1	Study and practice on machine tools and their operations.
C108.2	Practice on carpentry tools, components and pipe connections including plumbing work.
C108.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C108.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C108.5	Analyze the characteristics of basic electronic devices.
C108.6	Elaborate on the components, gates, soldering practices.

GE6163 – Physics and Chemistry Laboratory –I [C109]

C109.1	Hands on exercises undergone by the students will help them to apply physics principles of optics.
C109.2	Gain knowledge about thermal physics to evaluate engineering properties of materials.
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C109.4	Have basic idea about pH and conductometric titration.


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EC6201 – Electronic Devices [C114]

C114.1	Understand the working of semiconductor diode and its voltage and current characteristics.
C114.2	Understand the basic operation of BJT amplifiers and their voltage and current characteristics
C114.3	Understand the basic operation of different types of FET amplifiers and their voltage and current characteristics
C114.4	Understand the basic operation of special semiconductor devices, their characteristics and applications.
C114.5	Understand the basic principles of power devices and display devices, their characteristics and applications.

EE6201 – Circuit Theory [C115]

C115.1	Apply basic Kirchoff laws to solve the various electrical parameters using mesh and nodal analysis.
C115.2	Understand and apply various network theorems to solve the various electrical parameters for a given circuit.
C115.3	Understand the concept of resonance inductance and coupled circuits.
C115.4	Analyse the time response of circuits with passive components using Laplace transformation.
C115.5	Understand the concepts in three phase system in star and delta configuration.

GE6262 – Physics & Chemistry Laboratory - II [C116]

C116.1	Ability to test materials by using their knowledge of applied physics principles in optics and properties of matter.
C116.2	Assess the behaviour of columns, beams and failures of materials.
C116.3	Conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.
C116.4	Gain good knowledge about corrosion measurement.

EC6211 – Circuits and Devices Laboratory [C117]

C117.1	Analyze the characteristics of basic electronic devices
C117.2	Design RL and RC circuits.
C117.3	Verify Thevenin & Norton theorem KVL & KCL, and Super Position Theorems.


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COURSE OUTCOMES (CO)

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DEPARTMENT OF HUMANITIES AND SCIENCE (B.E. ELECTRICAL AND ELECTRONICS ENGINEERING)

PH6151-Engineering Physics-I [C103]

C103.1	Basics of crystals and their properties and applications in fields of engineering.
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C103.4	Dual nature of matter and its applications
C103.5	Production of laser and optical fibres. Their uses in communications.

CY6151 -Engineering Chemistry – I (C104)

C104.1	Understand the Principles of polymer chemistry and engineering applications of polymers.
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C104.3	Know the basic concepts of Analytical techniques and their importance.
C104.4	Understand knowledge in Industrial importance of Phase rule and alloys.
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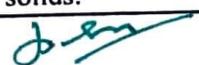
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GE6161 – Computer Practices Laboratory – (C107)

C107.1	Develop C programs for simple applications making use of basic constructs, arrays function, recursion, pointers, structures and strings
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C108.5	Analyze the characteristics of basic electronic devices
C108.6	Elaborate on the components, gates, soldering practices

GE6163 - Physics and Chemistry Laboratory – I (C109)

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C113.4	Understand fundamental concepts of Fuels and combustion
C113.5	Acquire knowledge in various energy sources and its applications.

GE6251-Basic civil and Mechanical-[C114]

C114.1	Appreciate the Civil and Mechanical Engineering components of Projects.
C114.2	Explain the usage of construction material and proper selection of construction materials.
C114.3	Measure distances and area by surveying.
C114.4	Identify the components used in power plant cycle. Demonstrate working principles of petrol and diesel engine.
C114.5	Elaborate the components of refrigeration and Air conditioning cycle..

EE6201-Circuit Theory –[C115]

C115.1	Apply basic kirchoffs laws to solve the various electrical parameters using mesh and nodal analysis.
C115.2	Understand and apply various network theorems to solve the various electrical parametrs for a given circuit..
C115.3	Understand the concept of resonance inductance and coupled circuits.
C115.4	Analyse the time response of circuits with passive components using laplace transformation.
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GE6262 - Physics and Chemistry Laboratory – II-[C116]

C116.1	Ability to test materials by using their knowledge of applied physics principles in optics and properties of matter..
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GE6263-Computer programming Laboratory-[C117]

C117.1	Use shell commands.
C117.2	Design of implement unix shell scripts
C117.3	Write and execute C programs and Unix

EE6211-Electrical Circuit Laboratory--[C118]

C118.1	Apply KCL,KVL and network theorms to simple and complex circuits.
C118.2	Demonstrate the working of CRO and determine the time constant of RC circuit.
C118.3	Determine frequency response of RLC circuits and use MATLAB to simulate series,parallel resonant circuit, low pass,high pass filter.
C118.4	Use MATLAB to simulate three phase balanced,unbalanced circuit and measure power in three phase circuit by two watt meter methods.
C118.5	Determine h,parameters of two port networks and calibrate single phase energy meter.


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**REGULATION – 2013
COURSE OUTCOMES(CO)**

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C104.1	Understand the Principles of polymer chemistry and engineering applications of polymers
C104.2	Understand the basic concepts of , thermodynamics and their importance
C104.3	Know the basic concepts of Analytical techniques and their importance
C104.4	Understand knowledge in Industrial importance of Phase rule and alloys.
C104.5	Know the concept of nanomaterials and its applications.

GE6151-Computer Programming [C105]

C105.1	Explain the basic organization of computers, the number systems and write the pseudo code for algorithms and flow chart.
C105.2	Develop C programming fundamentals, looping statements and solve problems
C105.3	Develop C programs for arrays and strings
C105.4	Use functions with pass by value and reference, pointers in programs
C105.5	Develop coding in C for structures and unions with storage classes and pre-processor

GE6152-Engineering Graphics [C106]

C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.2	Draw orthographic projections of lines and plane surfaces.
C106.3	Draw projections of solids
C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.

GE6161-Computer Practices Laboratory [C107]

C107.1	Develop C programs for simple applications making use of basic constructs, arrays function, recursion, pointers, structures and strings
C107.2	Design applications using sequential and random access file processing
C107.3	Develop C programs involving structures and union.


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24

Approved by AICTE & Affiliated to Anna University

email Id: principal@msec.edu.in

Website : www.msec.edu.in

**DEPARTMENT OF HUMANITIES AND SCIENCE
(B.TECH. INFORMATION TECHNOLOGY)**

GE6162-Engineering Practices Laboratory [C108]

C108.1	Study and practice on machine tools and their operations
C108.2	Practice on carpentry tools, components and pipe connections including plumbing work
C108.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C108.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C108.5	Analyse the characteristics of basic electronic devices
C108.6	Elaborate on the components, gates, soldering practices

GE6163-Physics and Chemistry Laboratory – I [C109]

C109.1	The hands on exercises undergone by the students will help them to apply physics principles of optics
C109.2	Students will gain knowledge about thermal physics to evaluate engineering properties of materials
C109.3	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of polymer and acid based related parameters.
C109.4	Students have basic idea about pH and conduct metric titration.

HS6251-Technical English-II [C110]

C110.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative.
C110.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C110.3	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
C110.4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
C110.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA6251-Mathematics – II [C111]

C111.1	Estimate vector identities and interpret some integral theorems in a vector field.
C111.2	Develop an ability to solve ordinary differential equations.
C111.3	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions.
C111.4	Identify and construct analytic function and application of conformal mapping.
C111.5	Apply complex integration to evaluate contour integrals.

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PH6251-Engineering Physics – II [C112]

C112.1	conducting materials using wave mechanics
C112.2	semiconducting materials and their application in engineering field.
C112.3	properties of magnetic and superconducting materials.
C112.4	significance of dielectric and its application in the field of engineering.
C112.5	upcoming new engineering materials and their applications in engineering fields.

CY6251-Engineering Chemistry – II [C113]

At the end of the course, the student will be able to

C113.1	Understand water treatment techniques will facilitate better understanding of engineering processes and applications for further learning
C113.2	Gain knowledge about with the principles electrochemistry, electrochemical cells, emf and applications of emf measurements.
C113.3	Gain basic knowledge in Principles of corrosion control.
C113.4	Understand fundamental concepts of Fuels and combustion.
C113.5	Acquire knowledge in various energy sources and its applications

CS6201-Digital Principles and System Design [C114]

C114.1	To understand different methods used for the simplification of Boolean functions
C114.2	To understand and design a system that uses combinational logic for the given specification. Simulate combinational logic systems using Verilog or VHDL
C114.3	To understand and design synchronous sequential system for the given specification. Simulate sequential logic systems using Verilog or VHDL.
C114.4	To design and implement Asynchronous sequential system for the given specification.
C114.5	To design and implement memory accessing systems and systems using PLA, PAL.

CS6202-Programming and Data Structures - I [C115]

C115.1	Develop Programs using functions and Pointers
C115.2	Explain the File handling concept in C language.
C115.3	Discuss about the various Linear Data Structure Operations and applications using ADT.
C115.4	Explain the various algorithms for sorting and searching.
C115.5	Demonstrate the indexing techniques in data structures.

GE6262-Physics & Chemistry Laboratory - II [C116]

C116.1	Test materials by using their knowledge of applied physics principles in optics and properties of matter.
C116.2	Assess the behaviour of columns, beams and failures of materials. 


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C116.3	Conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.
C116.4	Gain good knowledge about corrosion measurement

IT6211-Digital Laboratory [C117]

C117.1	Analyse the characteristics of logic gates
C117.2	Elaborate on the components , gates, code converters.
C117.3	Analyse, design and implement sequential logic circuits

IT6212-Programming and Data Structures Laboratory - I [C118]

C118.1	Develop simple C Programs using pointers and Functions
C118.2	Develop C program for Linear data structure operations and File Manipulation concepts
C118.3	Develop programs using various sorting algorithms and searching methods.


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COURSE OUTCOMES

HS6151- Technical English I [C101]

C101.1	Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
C101.2	Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topics.
C101.3	Read different genres of texts adopting various reading strategies
C101.4	Listen/view and comprehend different spoken discourses/excerpts in different accents.
C101.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA6151- Mathematics – I [C102]

C102.1	To find eigen values, eigenvectors, canonical form and inverse of a matrix.
C102.2	Acquire the knowledge of infinite and finite series and their convergence .
C102.3	Evaluate radius of curvature, evolute and envelope of given curves using differential calculus.
C102.4	Examine the concepts of functions of several variables and to find extremum value of a given function.
C102.5	Develop an ability to trace the curve and find area , volume using multiple integrals.

PH6151- Engineering Physics - I [C103]

C103.1	Basics of crystals and their properties and applications in fields of engineering.
C103.2	Basics of physics related to properties of matter, and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.
C103.3	Concept of sound production and application in the field of construction
C103.4	Dual nature of matter and its applications
C103.5	Production of laser and optical fibres. Their uses in communications.


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CY6151- Engineering Chemistry – I [C104]

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GE6162- Engineering Practices Laboratory [C108]

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C109.2	Gain knowledge about thermal physics to evaluate engineering properties of materials.
C109.3	Outfitted with hands-on knowledge in the quantitative chemical analysis of polymer and acid based related parameters.
C109.4	Basic idea about pH and conductometric titration.

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MA6251- Mathematics-II [C111]

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C111.3	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions.
C111.4	Identify and construct analytic function and application of conformal mapping.
C111.5	Apply complex integration to evaluate contour integrals.

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C112.1	Conducting materials using wave mechanics.
C112.2	Semiconducting materials and their application in engineering field.
C112.3	Properties of magnetic and superconducting materials.
C112.4	Significance of dielectric and its application in the field of engineering.
C112.5	Upcoming new engineering materials and their applications in engineering fields.

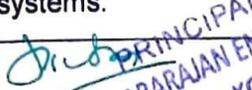
CY6251- Engineering Chemistry-II [C113]

C113.1	Understand water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C113.2	Gain knowledge about with the principles electrochemistry, electrochemical cells, emf and applications of emf measurements.
C113.3	Gain basic knowledge in Principles of corrosion control.
C113.4	Understand fundamental concepts of Fuels and combustion
C113.5	Acquire knowledge in various energy sources and its applications.

GE6252- Basic Electrical & Electronics Engineering [C114]

C114.1	Able to understand the basic theorems used in electrical circuits and the different componenets.
C114.2	Able to understand the principle of operation, construction and working function of electrical machines.
C114.3	Ability to understand electronics componenets operation, characteristics and its applications.
C114.4	Able to understand the design, principles of digital electronics circuits.
C114.5	Able to impart the knowledge of various communication systems.


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GE6253- Engineering Mechanics [C115]

C115.1	Enumerate the basic concepts of particle mechanics and solve problems
C115.2	Enumerate the basic of concepts of rigid body under static equilibrium and solve problems
C115.3	Determine the centroid of a line, areas, and volumes, center of mass of body and moment of inertia of composite areas
C115.4	Solve problems involving kinematics and kinetics of particles
C115.5	Solve problems involving kinetics of rigid bodies with and without friction

GE6261- COMPUTER AIDED DRAFTING AND MODELING LABORATORY[C116]

C116.1	Ability to design various structures using AutoCAD
C116.2	Ability to draw the detailing of the structures using various commands
C116.3	The students get knowledge about the different types of roof finishes
C116.4	The students get knowledge about the 3D modeling of the structures.
C116.5	Ability to get knowledge about the drafting of the structures in a easy way.

GE6262 - Physics & Chemistry laboratory-II [C117]

C117.1	Ability to test materials by using their knowledge of applied physics principles in optics and properties of matter..
C117.2	Assess the behaviour of columns, beams and failures of materials
C117.3	Conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters
C117.4	Gain good knowledge about corrosion measurement


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REGULATION-2013
COURSE OUTCOMES

MA6351- Transforms and Partial Differential Equations (C201)

C201.1	Formulate and solve partial differential equations.
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

GE6351-Environment Science and Engineering. (C202)

C202.1	Gain knowledge on flora and fauna in our environment helps to know about social environment.
C202.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C202.3	Gain knowledge on the basic concepts of Climate Change, Water scarcity and water shortage.
C202.4	Adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming.
C202.5	Gain knowledge about the problems faced by the society due to population explosion.

CE6301-Engineering Geology (C203)

C203.1	Understand the importance of various geological features, agencies and seismic zones in India.
C203.2	Gain a wide knowledge about the properties of various minerals and rock
C203.3	Gain knowledge about types and properties of rocks, their distribution and uses.
C203.4	Understand structure of folds, faults & joints and geophysical methods of investigation.
C203.5	Understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbour.

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CE6302 – Mechanics of Solids (C204)

C204.1	Know the behaviour of different material with its strength, stress, strain and deformation of solids with applications to bars, beams and thin cylinders.
C204.2	Know about the different types of supports and loading also able to find the shear force and bending moment in beams and understand concept of theory of simple bending with the induced stress resultants, deformations and about flitched beams
C204.3	Have sufficient knowledge to calculate the deflection of beams by different methods and selection of method for determining slope and deflection.
C204.4	Understand the effect of torsion on shafts and springs and apply basic equation of torsion in design of circular shafts and different types of springs.
C204.5	Have sufficient knowledge to analyse the pin jointed plane and space

CE6303 - Mechanics of Fluids. (C205)

C205.1	Gain knowledge about properties of fluids such as specific gravity, weight, volume and fluid statics problems in pressure measurement, forces on plane and buoyancy, floatation.
C205.2	Understand and solve problems related to equation of motion, continuity equation and Bernoulli's theorem, linear momentum equation and its applications
C205.3	Able to solve the losses of flow in pipes using Darcy and Weisbach's equation and also understand the concept of Moody's diagram
C205.4	Able to understand the turbulent and boundary layer of flow to find the drag force, displacement, energy and momentum thickness.
C205.5	Gain knowledge about dimensional, model and prototype analysis of hydraulic structures.

CE6304 Surveying I. (C206)

206.1	C	Gain knowledge about the fundamental principles and chain surveying and its applications.
206.2	C	Gain knowledge about the compass and plane table surveying and its applications.
206.3	C	Gain knowledge about the applications of levelling such as computation of areas, volumes, contours and mass haul diagrams.
206.4	C	Gain knowledge about the applications of levelling, its types, errors and adjustments.
206.5	C	Gain knowledge about theodolite and tachometric surveying.


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CE6311 Survey Practical I. (C207)

C207.1	Acquire practical knowledge of handling basic surveying instruments.
C207.2	Estimate the areas and locate the features using chain and plane table surveying.
C207.3	Capable of conducting surveys using compass survey and to adjust the compass traverse graphically.
C207.4	Estimate inaccessible distance and elevation of objects using levelling.
C207.5	Deduct reduced levels using various methods of levelling and developments of contour map and also will be able to study parts of theodolite

CE6312 Computer Aided Building Drawing (C208)

C208.1	Gain knowledge on the components of building types, specifications, orientation and functional requirements as per NBC.
C208.2	Gain knowledge about drawing tools, commands and shortcuts in drafting software.
C208.3	Draft the plan, elevation and sectional views of structures such as non-load bearing buildings, RCC framed structure, sloped roof and industrial buildings.
C208.4	Improve management of project life cycle using BIM.
C208.5	Draw model buildings in 2D and 3D view.

MA6459 Numerical Methods. (C209)

C209.1	Have clear perception of the power of numerical techniques ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.
C209.2	Gain knowledge of interpolation-forward and backward.
C209.3	Solve problems in differentiation and integration.
C209.4	solve various types of initial value partial differential Equations
C209.5	Solve various types of Seidal method problems.


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CE6401 Construction Materials (C210)

C210.1	Understand the properties of most common building materials such as stones, bricks and concrete blocks.
C210.2	Understand the typical and potential applications of lime, cement, aggregates and their properties.
C210.3	Understand the materials used in preparation of concrete and its mix design.
C210.4	Understand the applications of timber and other materials including their properties.
C210.5	Understand the importance of modern material for construction and their properties.

CE6402 Strength of Materials. (C211)

C211.1	Have a thorough knowledge about the analysis of indeterminate beams and the use of energy methods for estimating the slope and deflections of beam and trusses
C211.2	Gain knowledge on indeterminate beams and will be able to determine shear force and bending moment by using theorem of three moments.
C211.3	Have a basic idea of bucking loads of columns for different end conditions and also about thick and compound cylinders.
C211.4	Gain knowledge about the state of stresses in three dimensions, theories of failure and application in analysis of stress and load carrying capacity
C211.5	Have a clear idea about the unsymmetrical bending of beams, shear centre and curved beams by using Winkler Bach formula.

CE6403 Applied Hydraulic Engineering (C212)

C212.1	Gain knowledge of uniform flow fluid mechanics for addressing problems in open channels.
C212.2	Gain knowledge of various hydraulic engineering problems like gradually varied flows in study state conditions. The student will be able to relate the theory and compute the gradually varied flow problems.
C212.3	Gain knowledge of various hydraulic engineering problems like rapidly Varied flows in study state conditions. The student must be able to relate the theory and compute the Rapidly varied flow problems.
C212.4	Gain knowledge of various hydraulic machineries problems like in turbines. Students must be able to relate the theory and compute the Pumps problems
C212.5	Gain knowledge of various hydraulic machineries problems like in Pumps. Students should be able to relate the theory and compute the Pumps problems


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CE6404 Surveying II. (C213)

C213.1	Gain knowledge about the different elements of geodetic measurements, control survey methodology and its adjustments.
C213.2	Gain knowledge about components, working principle and applications of total station.
C213.3	Gain knowledge about the working principle of GPS, its components, signal structure and sources of error in measurements.
C213.4	Understand the concepts of modern surveying methods.
C213.5	Understand the concepts and applications of astronomical surveying.

CE6405 Soil Mechanics (C214)

C214.1	Classify the soil and assess the engineering properties, based on index properties.
C214.2	Understand the stress concepts and permeability in soils.
C214.3	Understand and identify the settlement in soil.
C214.4	Determine the shear strength of soil
C214.5	Analyse both finite and infinite slopes.

CE6411 Strength of Materials Laboratory (C215)

C215.1	Determine the important mechanical properties of materials.
C215.2	Perform different destructive testing on various materials
C215.3	Compute the hardness of various metals
C215.4	Evaluate the mechanical properties of various materials like Concrete, steel and wood.
C215.5	Determine the stiffness of the helical springs.


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CE6502 Foundation Engineering (C302)

C302.1	Understand the site investigation, methods and sampling with respect to foundation of building.
C302.2	Gain knowledge on bearing capacity and testing methods to find safe bearing capacity based on field investigation, laboratory test and methods of minimizing total and differential settlements.
C302.3	Design footings based on loads on structure, bearing capacity of soil and seismic force.
C302.4	Determine the load carrying capacity and settlement of pile foundation based on field investigation and soil properties.
C302.5	Gain knowledge on earth pressure analysis and stability analysis of retaining walls.

CE6503 Environmental Engineering I (C303)

C303.1	Understanding of water quality criteria and standards and their relation to public health.
C303.2	Have an insight into the structure of drinking water supply systems, including water transport, treatment and distribution.
C303.3	Have the ability to design various functional units in treatment system
C303.4	Know the detailed treatment systems involved in treating water including advanced treatment units
C303.5	Gain the ability to design and evaluate water supply systems and their alternatives on basis of chosen selection criteria.

CE6504 Highway Engineering (C304)

C304.1	Gain knowledge of history of road development, cross sections of road, classification of roads and factors influencing highway alignment.
C304.2	Gain knowledge of types of horizontal and vertical curves, concept of super elevation, transition curves and gradients.
C304.3	Gain knowledge of pavement components and design consideration of flexible and rigid pavement as per IRC guidelines.
C304.4	Gain knowledge about properties and testing of highway materials, quality control measures and highway drainage.
C304.5	Gain knowledge of pavement evaluation, maintenance of pavement, roughness, present serviceability index and skid resistance.


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363, Arcot Road, Kodambakkam, Chennai – 24
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email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CE6505 Design of Reinforced Concrete Elements (C305)

C305.1	Understand the type of loadings and various design methods for the design of RC elements and also able to classify the section.
C305.2	Analysis and design of beams and flanged beams and the types of loads acting on the slab and also design the various types of slabs by limit state method.
C305.3	Understand the design of beams for shear, bond and torsion
C305.4	Design columns for axial, uniaxial and biaxial eccentric loadings.
C305.5	Understand the safe bearing capacity of soil and Design the footing by limit state method

CE6506 Construction Techniques, Equipment and Practice (C306)

C306.1	Gain knowledge on manufacturing process of concrete and its testing methods.
C306.2	Gain knowledge on the general construction method step by step practicing in site.
C306.3	Gain knowledge on the sub structures.
C306.4	Gain knowledge on the super structures.
C306.5	Gain knowledge on selection factors, various types of equipment for earthwork, foundation concreting, material handling, erection, dredging, trenching and tunnelling.

GE6674 Communication and Soft skills- Laboratory Based (C307)

C307.1	Take international examination such as IELTS and TOEFL.
C307.2	Make presentations and Participate in Group Discussions
C307.3	Successfully answer questions in interviews


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363, Arcot Road, Kodambakkam, Chennai – 24
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CE6511 Soil Mechanics Laboratory (C308)

C308.1	Gain knowledge of site specific field investigations including collection of soil samples for testing and observation of soil behaviour/ building damage.
C308.2	Identify and classify soil based on standard geotechnical engineering practice.
C308.3	Capable of performing laboratory compaction and in-place density tests for fill quality control.
C308.4	Determine index properties of the soil and its behaviour
C308.5	Determine engineering properties such as shear strength, compressibility and permeability by conducting appropriate tests.

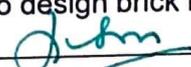
CE6512 Survey Camp (C309)

C309.1	Gain a thorough knowledge of preparation of contours in different terrains
C309.2	Gain a good idea of calculation of earthwork excavation.
C309.3	Apply a variety of techniques about computing large areas
C309.4	Well versed with the concept of astronomical surveying
C309.5	Capable of drawing the features of different elements along the proposal road

CE6601 Design of Reinforced Concrete & Brick Masonry Structures. (C310)

C310.1	Basic knowledge on the design of retaining wall.
C310.2	Gain knowledge about embankment structures and their types.
C310.3	Knowledge about working stress method and their component of structures.
C310.4	Basic knowledge about cracks and determine collapse load by using virtual work method.
C310.5	Gain knowledge about brick masonry structures and will be able to design brick masonry structures.


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363, Arcot Road, Kodambakkam, Chennai – 24
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CE6602 Structural Analysis II (C311)

C311.1	Gain knowledge about flexibility method and will be able to analyse the structures by using matrix flexibility method.
C311.2	Gain knowledge about stiffness method and will be able to analyse the structures by using stiffness matrix methods.
C311.3	Gain knowledge about finite element method and will be able to solve Plane stress and plane strain problems for triangular elements, truss element, beam element
C311.4	Gain knowledge about Upper and lower bound theorems and will be able to perform plastic analysis of indeterminate beams and frames.
C311.5	Gain knowledge about space trusses and cable structures and will be able to analyse the suspension bridges with two and three hinged stiffening girders and also space truss using tension coefficient method.

CE6603 Design of Steel Structures (C312)

C312.1	Design the connection for steel structures using rivet, bolt and weld
C312.2	Identify the different failure modes of steel tension and compression members and compute their design strength
C312.3	To select the most suitable section shape and size for tension and compression members
C312.4	Design the beam subjected to uniaxial and biaxial bending
C312.5	Design the various structural component in industrial steel structures.

CE6604 Railways, Airports and Harbour Engineering.(C313)

C313.1	Gain knowledge about the design of railway elements.
C313.2	Gain knowledge about hierarchy order of construction and maintenance of Metro, Mono and Underground railways.
C313.3	Plan and design the airport runway and plan the orientation of structures.
C313.4	Plan and design harbours and gain knowledge of the construction of coastal structures and their elements with proper environmental concern for port operations.
C313.5	Design runway, gain knowledge on pavement design principles and elements of taxiway, passenger facilities & services


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363, Arcot Road, Kodambakkam, Chennai – 24
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CE6605 Environmental Engineering II (C314)

C314.1	Understand the planning for sewage systems.
C314.2	Gain knowledge of designing, laying and testing of sewerage systems
C314.3	Know the primary treatment units for sewage.
C314.4	Know the detailed treatment systems involved in treating sewage including advanced treatment units.
C314.5	Know the disposal and sludge management techniques.

CE6004 Architecture. (C315)

C315.1	Understand the basics of architecture, elements and principles and knowledge of its function and application.
C315.2	Understand the concept of architectural surveying and rules to explore and aid in designing.
C315.3	Utilise the building typology and their and regulation, application of the standards and rules to design a given building
C315.4	Classify the concepts of climate and building types, green building concepts and their uses.
C315.5	Gain knowledge on town planning concepts, standards and the overall master plan along with their principles.

CE6611 Environmental Engineering Laboratory.(C316)

C316.1	Determine physical, chemical and biological characteristics of water and wastewater.
C316.2	Calculate optimum dosage of coagulant.
C316.3	Assess the quality of water and waste water.
C316.4	Quantify the pollutant concentration in water and wastewater.
C316.5	Examine the conditions for the growth of micro-organisms.


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363, Arcot Road, Kodambakkam, Chennai – 24
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C6612 Concrete and Highway Engineering laboratory (C317)

C317.1	Assess the principles of testing fresh concrete.
C317.2	Gain experience on conducting the tests on hardened concrete.
C317.3	Gain experience on conducting various tests on aggregates.
C317.4	Gain experience on conducting various tests on bitumen.
C317.5	Understand the techniques to characterize various pavement materials through relevant tests conducted on bituminous mixes.

CE6701 Structural Dynamics and Earthquake Engineering. (C401)

C401.1	Apply the laws of dynamics to establish simple and realistic mathematical models of engineering
C401.2	Formulate equation of motion for single degree of freedom subjected to free and forced vibrations
C401.3	Determine the natural frequency for multi-storey building subjected to dynamic loading
C401.4	Summarize the characteristics of earthquake and its effect on structures
C401.5	Estimate lateral forces and the behaviour of reinforced concrete and pre-stressed concrete structure under earthquake loading

CE6702 Prestressed Concrete Structures. (C402)

C402.1	Understand the materials used in prestressed elements and stress distribution of prestressed concrete members and to analyze the prestressed concrete beams.
C402.2	Have knowledge on methods of prestressing and able to design various prestressed concrete structural elements.
C402.3	Analyse for deflection of prestressed concrete members and design anchorage zone.
C402.4	Gain knowledge on analyze and design of composite beams and continuous beams.
C402.5	Design a prestressed concrete structures-sleeper, tanks pipes and poles.


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CE6703 Water Resources and Irrigation Engineering. (C403)

C404.1	Gain knowledge on water resources planning and design, operation and management of reservoir system.
C404.2	Know about the national water policy, master planning of water resources, consumptive and non-consumptive use of water resources.
C404.3	Gain knowledge on merits and demerits, irrigation efficiency and crop water requirement based on different methods
C404.4	Gain knowledge on types of canal irrigation and its components with function.
C404.5	Know about the different methods of irrigation, irrigation scheduling, water distribution system and participatory irrigation management.

CE6704 Estimation and Quantity Surveying. (C404)

C404.1	Understand the different sectional of buildings structures from foundation to superstructure, apply different types of estimates in different situations and also able to prepare the estimate of quantities of items of works in building structures.
C404.2	study drawings related to estimate of an all items in each structure like water supply and sanitary works, road works and irrigation works
C404.3	write the general and detail specification of each item of building structures and also able to understand the rate analysis of each item of work, concepts of contract documents, rules for tender document etc.
C404.4	Prepare valuation based on different method followed in practice for land and buildings and standard rent calculation.
C404.5	Prepare the reports with respect to various construction projects.

CE6010 Pavement Engineering. (C405)

C405.1	Understand the cross section of road works or pavements, study of different layers in pavement and its stress and deflection due to repeated loading.
C405.2	Gain knowledge about design procedure for flexible pavements through IRC guidelines, empirical methods, semi empirical methods and factors affecting the pavement.
C405.3	Have the knowledge of design methods in rigid pavements through IRC guidelines and Westergaards approach in analysis, scope of concrete roads in India.
C405.4	Gain knowledge about evaluation based on physical appearance, structural evaluation and pavement maintenance.
C405.5	Have the knowledge of testing, field control and stabilization of pavements with the use of geosynthetic method.


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Website : www.msec.edu.in
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CE6011 Air Pollution Management. (C406)

C406.1	Understand the nature, characteristics and basic concepts of air pollutants.
C406.2	Design stacks and to study the plume characteristics in relation to atmosphere
C406.3	Design and evaluate air pollutant alternatives on basis of chosen selection criteria
C406.4	Understand of the nature and basic concepts of air pollutant management and their standards
C406.5	Identify, formulate and solve air and noise pollution problems

CE6711 Computer Aided Design and Drafting Laboratory (C407)

C407.1	knowledge in design and drawing of RCC cantilever and counter fort type retaining walls with reinforcement details
C407.2	knowledge in design of solid slab and RCC Tee beam bridges for IRC loading and reinforcement details
C407.3	knowledge in design and drafting of circular and rectangular RCC water tanks
C407.4	knowledge in design of plate Girder Bridge, Truss Girder bridges and detailed drawings including connections
C407.5	Knowledge in design of hemispherical bottomed steel tank.

CE6712 Design Project. (C408)

C408.1	Design projects and will have a better experience in design.
C408.2	Gain an experience in various design problems related to Civil engineering.
C408.3	Gain knowledge on updated latest software.
C408.4	Solve complex civil engineering problems in design and analysis.
C408.5	Have a better experience in analysis of civil structures.


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363, Arcot Road, Kodambakkam, Chennai – 24
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Website : www.msec.edu.in
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MG6851 Principles of Management. (C409)

C409.1	Perform managerial functions like planning, organizing, staffing, leading & controlling.
C409.2	Acquire a basic knowledge on international aspect of management
C409.3	Gain a basic knowledge of management and its evolution.
C409.4	Gain knowledge of budgetary control and their strategies.
C409.5	Understand the motivational theories existing in management.

CE6016 Prefabricated Structures (C410)

C410.1	Gain knowledge about design principles, layout of factory and stages of loading in precast of different elements and precast construction.
C410.2	Acquire knowledge about panel systems, slabs, connection used in precast construction and they will be in a position to design the elements.
C410.3	Gain knowledge about types of floor systems, stairs and roofs used in precast construction.
C410.4	Know the types of walls used in precast construction, sealants, design of joints.
C410.5	Gain knowledge in behaviour of structural elements during abnormal loadings.

CE6016 Repair and Rehabilitation of Structures (C411)

C411.1	Determine the various types of cracks and maintenance in R.C structures and masonry structures.
C411.2	Identify the requirements of serviceability and durability in concrete.
C411.3	Understand and classify various types of repairing materials to regain its strength.
C411.4	Identify the damage of the structures by non-destructive testing.
C411.5	Understand the various techniques of rehabilitation of structures.


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363, Arcot Road, Kodambakkam, Chennai – 24
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email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CE6811 Project Work (C412)

C412.1	Take up challenging practical problems.
C412.2	Solve problems by formulating proper methodologies.
C412.3	Gain knowledge of the civil engineering field.
C412.4	Gain knowledge and be up to date with the latest technology.
C412.5	Find solutions for complex civil engineering problems.


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363, Arcot Road, Kodambakkam, Chennai – 24
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Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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REGULATION-2013
COURSE OUTCOMES

MA6351-Transforms and partial differential Equations – [C201]

C201.1	Formulate and solve partial differential equations.
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

CS6301 - Programming and Data Structure II – [C202]

C202.1	Explain the fundamentals of Object Oriented Programming.
C202.2	Demonstrate the concepts of data abstraction, encapsulation and inheritance.
C202.3	Outline the concepts of Exception handling and templates.
C202.4	Summarize about tree preliminaries and other tree structures.
C202.5	Demonstrate different graph data structure algorithms.

CS6302 - Database Management Systems - [C203]

C203.1	Design Databases for applications and use the Relational model, ER Diagrams.
C203.2	Construct DDL, DML, TCL and DCL commands for different databases with various constraints.
C203.3	Apply concurrency control and recovery mechanisms for practical Problems.
C203.4	Able to select best data storage medium for databases.
C203.5	Apply security concepts to databases.


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Website : www.msec.edu.in
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CS6303 - Computer Architecture – [C204]

C204.1	Understand basic structure and operation of digital computer.
C204.2	Design arithmetic and logic unit.
C204.3	Design and analyze pipelined control units.
C204.4	Understand parallel processing architectures.
C204.5	Evaluate performance of memory systems.

CS6304 - Analog and Digital Communication - [C205]

C205.1	Apply analog communication techniques.
C205.2	Apply digital communication techniques.
C205.3	Use data and pulse communication techniques.
C205.4	Analyze Source and Error control coding.
C205.5	Utilize multi-user radio communication.

GE6351 - Environment Science and Engineering – [C206]

C206.1	Gain knowledge on flora and fauna in our environment helps to know about social environment.
C206.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C206.3	Gain knowledge on the basic concepts of Climate Change, Water scarcity and water shortage.
C206.4	Adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming.
C206.5	Gain knowledge about the problems faced by the society due to population explosion.


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CS6311- Programming and Data Structure Laboratory II - [C207]

C207.1	Select good programming design methods for program development.
C207.2	Develop C++ programs for object oriented concepts.
C207.3	Develop C++ programs for handling exceptions.
C207.4	Develop C++ programs for practical problems using non-linear data structures.
C207.5	Develop recursive programs using trees and graphs.

CS6312 - Database Management Systems Lab – [C208]

C208.1	Infer database language commands to create simple database.
C208.2	Analyze the database using queries to retrieve records.
C208.3	Applying PL/SQL for processing database.
C208.4	Analyze front end tools to design forms, reports and menus.
C208.5	Develop solutions using database concepts for real time requirements.

MA6453 - Probability and Queueing Theory – [C209]

C209.1	Interpret the axiomatic formulation of Probability theory and random variables as an intrinsic need for the analysis of random phenomena.
C209.2	Identify probability models, function of random variables based on one & two dimensional random variables and determine regression.
C209.3	Classify the concept of random processes and to demonstrate the specific applications to Poisson and Markov Processes.
C209.4	Examine the specific applications of queuing models.
C209.5	Illustrate the networks ideas and series queues.



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CS6551 - Computer Networks – [C210]

C210.1	Explain the components requirement of networks and link layer service.
C210.2	Classify the Media Access Control Protocols and different Internetworking.
C210.3	Demonstrate various types of routing techniques.
C210.4	Outline the mechanisms involved in transport layer.
C210.5	Experiment with different application layer protocols.

CS6401 - Operating Systems – [C211]

C211.1	Explain the basic concepts ,functions of Operating Systems and system calls.
C211.2	Outline various threading models, process synchronization, Compare the performance of various CPU scheduling algorithms and deadlocks.
C211.3	Compare and contrast various memory management schemes.
C211.4	Explain I/O management and file systems.
C211.5	Model Linux multifunction server and utilize local network services.

CS6402 - Design and Analysis of Algorithms – [C212]

C212.1	Analyze the complexity of algorithms for various computing problems.
C212.2	Design and analyse solutions to problems based on Brute Force and Divide and Conquer approaches.
C212.3	Design and analyse solutions to problems based on dynamic programming and greedy approach.
C212.4	Design and analyse solutions to problems based on iterative improvement method.
C212.5	Modify existing algorithms to improve efficiency.



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EC6504 - Microprocessor and Microcontroller – [C213]

C213.1	Understand architecture of 8086 and Design and implement programs on 8086 microprocessor.
C213.2	Understand signals, system bus architecture of 8086 and multiprocessor configuration.
C213.3	Design and implement interfacing of I/O circuits with 8086 microprocessor.
C213.4	Understand architecture of 8051 microcontroller.
C213.5	Understand architecture of 8051, Design and implement programs on 8051 microcontroller.

CS6403 - Software Engineering – [C214]

C214.1	Explain the software engineering process and project management.
C214.2	Demonstrate software requirements and analysis.
C214.3	Outline the software design process and user interface.
C214.4	Compare and contrast various software testing.
C214.5	Discuss about the software integration and project management.

CS6411 - Networks Laboratory – [C215]

C215.1	Use simulation tools.
C215.2	Implement the various protocols.
C215.3	Analyze the performance of the protocols in different layers.
C215.4	Analyze various routing algorithms.



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CS6412 - Microprocessor and Microcontroller Lab – [C216]

C216.1	Introduce ALP concepts and features.
C216.2	Write ALP for arithmetic and logical operations in 8086 and 8051.
C216.3	Differentiate Serial and Parallel Interface.
C216.4	Interface different I/Os with Microprocessors.
C216.5	Be familiar with MASM.

CS6413 - Operating Systems laboratory – [C217]

C217.1	learn Unix commands and shell programming.
C217.2	Implement various CPU Scheduling Algorithms.
C217.3	Implement Process Creation and Inter Process Communication.
C217.4	Implement Deadlock Avoidance and Deadlock Detection Algorithms.
C217.5	Implement Page Replacement Algorithms and File Organization , File Allocation Strategies.

MA6566 - Discrete Mathematics – [C301]

C301.1	Make use of propositions, predicates and flow of logical proofs.
C301.2	Acquire knowledge on induction and counting principles and to solve recurrence relation.
C301.3	Perceive the knowledge of various types and characteristics of graphs.
C301.4	Interpret concepts and properties of groups, rings and fields.
C301.5	Comprehend the ideas of lattices and Boolean algebra.


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CS6501 - Internet Programming – [C302]

C302.1	Explain the concepts of Control Statements, I/O Applet and Threading.
C302.2	Develop a basic website using HTML and Cascading Style Sheets.
C302.3	Compare and contrast the Java Script programming for client and server along with its event handling mechanisms.
C302.4	Build a simple web page in PHP with XML data format.
C302.5	Explain web services and client presentation using AJAX.

CS6502 - Object Oriented Analysis & Design – [C303]

C303.1	Design and implement projects using OO concepts.
C303.2	Use the UML analysis and design diagrams.
C303.3	Apply appropriate design patterns.
C303.4	Create code from design.
C303.5	Compare and contrast various testing techniques.

CS6503 - Theory of Computation – [C304]

C304.1	Outline the concept of Finite Automata and Regular Expression.
C303.2	Illustrate the design of Context Free Grammar for any language set.
C303.3	Demonstrate the push down automaton model for the given language.
C303.4	Make use of Turing machine concept to solve the simple problems.
C303.5	Explain decidability or un decidability of various problems.

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CS6504 - Computer Graphics – [C305]

C305.1	Understand graphical devices and output primitives.
C305.2	Design and Apply two dimensional transformations.
C305.3	Design and Apply three dimensional graphics.
C305.4	Apply Illumination and color models.
C305.5	Design animation sequences.

CS6511 - Case Tools Laboratory – [C306]

C306.1	Design and implement projects using OO concepts.
C306.2	Use the UML analysis and design diagrams.
C306.3	Apply appropriate design patterns.
C306.4	Create code from design.
C306.5	Compare and contrast various testing techniques.

CS6512 - Internet Programming Lab – [C307]

C307.1	Illustrate web pages using HTML/XML and style sheets.
C307.2	Analyze user interfaces using Java frames and applets.
C307.3	Compare and contrast dynamic web pages using server side scripting.
C307.4	Develop a Client Server application and use the frameworks JSP Strut, Spring.
C307.5	Build the applications using AJAX.


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Website : www.msec.edu.in
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CS6513 - Computer Graphics Lab – [C308]

C308.1	Create 3D graphical scenes using open graphics library suits.
C308.2	Implement image manipulation and enhancement.
C308.3	Create 2D animations using tools.

CS6601 - Distributed Systems – [C309]

C309.1	Explain the distributed systems architecture, foundations and issues of distributed systems.
C309.2	Outline the inter process communication in distributed systems.
C309.3	Explain the file accessing model and various services in distributed system.
C309.4	Demonstrate concurrency control and properties of transaction in Distributed systems.
C309.5	Discuss resource and process management in distributed system

IT6601 - Mobile Computing – [C310]

C310.1	Explain the basics of mobile telecommunication system.
C310.2	Choose the required functionality at each layer for given application.
C310.3	Identify solution for each functionality at each layer.
C310.4	Use simulator tools and design Ad hoc networks.
C310.5	Develop a mobile application.



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363, Arcot Road, Kodambakkam, Chennai – 24
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CS6660 - Compiler Design – [C311]

C311.1	Understand the different phases of compiler.
C311.2	Design lexical analyser for a sample language.
C311.3	Apply different parsing algorithms to develop the parsers for a given grammar.
C311.4	Understand syntax-directed translation and run-time environment.
C311.5	Apply code optimization techniques and design simple code generator.

IT6502 - Digital Signal Processing – [C312]

C312.1	Apply DFT for the analysis of digital signals and systems.
C312.2	Design IIR and FIR filters.
C312.3	Characterize finite word length effects on filters.
C312.4	Design the Multi rate filters.
C312.5	Apply adaptive filters to equalization.

CS6659 - Artificial Intelligence – [C313]

C313.1	Understand the various AI search algorithms (uninformed, informed, constraint satisfaction algorithms).
C313.2	Apply various knowledge representation techniques to solve real world problems.
C313.3	Demonstrate the knowledge of reasoning with certain and/or uncertain information.
C313.4	Identify various planning techniques and machine learning techniques to solve real-world problems.
C313.5	Analyse the application of expert systems.



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363, Arcot Road, Kodambakkam, Chennai – 24
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GE6757 - Total Quality Management – [C314]

C314.1	Select and apply appropriate techniques in identifying customer needs, as well as the quality impact that will be used as inputs in TQM methodologies.
C314.2	Have a strategy to create and maintain a quality culture that will move the organization towards world-class status.
C314.3	Understand the TQM concept and techniques for managing, controlling and improving quality at the workplace.
C314.4	Knowing business excellence models and be able to assess organizations performance through data collection and analysis.
C314.5	Have a strategy to implement total quality practices at the workplace and effect savings on the input cost of an organization.

CS6611 - Mobile Application Development Lab – [C315]

C315.1	Design and Implement various mobile applications using emulators.
C315.2	Deploy applications to hand-held devices.

CS6612 - Compiler Lab – [C316]

C316.1	Implement the different Phases of compiler using tools.
C316.2	Analyze the control flow and data flow of a typical program.
C316.3	Optimize a given program.
C316.4	Generate an assembly language program equivalent to a source language.

GE6674 - Communication and Soft Skills - Laboratory Based – [C317]

C317.1	Take international examination such as IELTS and TOEFL.
C317.2	Make presentations and Participate in Group Discussions
C317.3	Successfully answer questions in interviews

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363, Arcot Road, Kodambakkam, Chennai – 24

Approved by AICTE & Affiliated to Anna University

Email Id: principal@msec.edu.in

Website : www.msec.edu.in

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CS6701 - Cryptography and Network Security – [C401]

C401.1	Understand the classical encryption techniques and solve the mathematical fundamentals behind the cryptographic algorithms.
C401.2	Comprehend the principles and working of block ciphers, symmetric key and public key cryptographic algorithms.
C401.3	Understand the working and usage of hash functions and digital signatures.
C401.4	Describe the various network security practices and design applications.
C401.5	Analyse protocols for various security objectives.

CS6702 - Graph Theory and Applications – [C402]

C402.1	Classify precise and accurate mathematical definitions of objects in graph theory.
C402.2	Illustrate fundamentals of circuits, cutsets, network flows & graph.
C402.3	Discuss about chromatic characteristics and directed graph.
C402.4	Outline Permutations and Combinations with generating function.
C402.5	Make use of theoretical knowledge and independent mathematical thinking in graph theory questions' investigation.

CS6703 - Grid and Cloud Computing – [C403]

C403.1	Outline the concept of Grid and Cloud Architectures.
C403.2	Illustrate the data intensive grid service models and grid computing techniques.
C403.3	Demonstrate the concept of virtualization in cloud.
C403.4	Experiment with the programming model for Hadoop and globus toolkit.
C403.5	Interpret the security models in the grid and cloud environment.

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363, Arcot Road, Kodambakkam, Chennai – 24

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CS6704 – Resource Management and Techniques – [C404]

C404.1	Formulate and solve Linear programming problem.
C404.2	Translate Duals from Primals, Optimization of transportation, assignment models and Shortest routes of networks.
C404.3	Demonstrate the concept of Integer and Dynamic programming problem.
C404.4	Assessing unconstrained and constrained extremal problems.
C404.5	Interpret PERT and CPM techniques for time scheduling and tracing critical path network.

CS6003 - Adhoc Sensor Networks – [C405]

C405.1	Students will understand the basic concepts of WIRELESS networks and challenges of ad hoc and sensor networks.
C405.2	The students gain knowledge on Classification of the design issues and different categories of MAC protocols .
C405.3	The students understand to explain the various ad hoc routing protocols and transport layer mechanisms.
C405.4	The students understand the sensor network characteristics and wireless sensor network layer protocols .
C405.5	The students will illustrate the issues of routing in wsn and QoS related performance measurements.

CS6007 - Information Retrieval – [C406]

C406.1	Learn the role of information retrieval in various real-time applications.
C406.2	Understand and apply the information retrieval models.
C406.3	Design Web Search Engine.
C406.4	Use Link Analysis and understand the Hadoop and Map Reduce.
C406.5	Learn document text mining techniques.

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CS6711 - Security Lab – [C407]

C407.1	Implement the cipher techniques.
C407.2	Develop the various security algorithms.
C407.3	Use different open source tools for network security and analysis.

CS6712 - Grid and Cloud Computing Lab – [C408]

C408.1	Use the grid and cloud tool kits.
C408.2	Design and implement applications on the Grid.
C408.3	Design and Implement applications on the Cloud.

CS6801 - Multi-Core Architectures and Programming – [C409]

C409.1	Understand the need, characteristics for multicore architectures and solve parallel problems.
C409.2	Identify the issues and challenges in programming Parallel Processors.
C409.3	Understand shared memory programming and develop programs using Open MP.
C409.4	Understand distributed memory programming and develop Programs using MPI.
C409.5	Compare and contrast programming for serial processors and programming for parallel processors.

CS6008 - Human Computer Interaction – [C410]

C410.1	Design Effective Dialog For HCI.
C410.2	Design Effective HCI For Individuals And Persons With Disabilities.
C410.3	Assess The Importance Of User Feedback.
C410.4	Explain The HCI Implications For Designing Multimedia/ Ecommerce/ E-Learning Web sites.
C410.5	Develop Meaningful User Interface.



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GE6075 - Professional Ethics in Engineering – [C411]

C411.1	Gain awareness on human values for professional excellence and stress management.
C411.2	Gain knowledge on engineering ethics, moral issues & uses of ethical theories.
C411.3	Understand the role of engineers as responsible experimenters along with courses of ethics in engineering field.
C411.4	Gain awareness of responsibilities of an engineer for safety and risks along with risk benefit analysis.
C411.5	Acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives.

CS6811 - Project Work – [C412]

C412.1	Review the literature and develop solutions for framed problem statement.
C412.2	Implement hardware and/or software techniques for identified problems.
C412.3	Test and analyses the modules of planned project.
C412.4	Write technical report and deliver presentation.
C412.5	Apply engineering and management principles to achieve project goal.


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REGULATION – 2013

COURSE OUTCOMES (CO)

MA6351 – Transforms and Partial Differential Equations [C201]

C201.1	Formulate and solve partial differential equations
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

EE6352 - Electrical Engineering and Instrumentation [C202]

C202.1	Understand three phase supply and power measurement
C202.2	Understand the concepts in electrical generators, motors and transformers
C202.3	Understand the concepts in Induction machines and synchronous machines.
C202.4	Understand the basic measurement and instrumentation based devices.
C202.5	Understand the relevance of digital instruments in measurements.

EC6301 - Object Oriented Programming and Data Structures [C203]

C203.1	Understand about Object oriented programming
C203.2	Explain the virtual functions polymorphism and file handling
C203.3	Formulate the algorithm for stacks and queues
C203.4	Categorize graph algorithms topological sort and minimum spanning tree.
C203.5	Implement greedy algorithm and dynamic programming


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363, Arcot Road, Kodambakkam, Chennai – 24
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EC6302 - Digital Electronics [C204]

C204.1	Simplify Boolean functions using Kmap and quine Mclasky
C204.2	Design and analyze combinational circuits
C204.3	Design and analyze sequential circuits
C204.4	Implement designs using programmable logic devices
C204.5	Design and Analyze Synchronous and Asynchronous Sequential Circuits and to write simple HDL codes

EC6303 – Signals and Systems [C205]

C205.1	Analyze & classify Continuous and Discrete time signals and to identify LTI systems
C205.2	Derive the Fourier series for continuous time signals and analyze the Fourier transform and Laplace transform of different signals
C205.3	Analyze the output response of the Continuous Time systems by performing convolution and realize the continuous Time Systems
C205.4	Analyze the Discrete Time Fourier Transform and Z transform of Discrete Time signals & Understand the sampling theorem and to convert the analog signal to discrete signal
C205.5	Analyze the output response of the Discrete Time systems by performing convolution and realize the Discrete Time Systems

EC6304 – Electronic Circuits-I [C206]

C206.1	Understand the basic concept of biasing and design biasing for various types of amplifiers
C206.2	Design and analyse BJT amplifiers
C206.3	Design and analyse FET amplifiers
C206.4	Analyze the frequency response of amplifier performances
C206.5	Understand the basic concepts of IC MOSFET amplifiers


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363, Arcot Road, Kodambakkam, Chennai – 24
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EC6311 – Analog and Digital Circuits Laboratory [C207]

C207.1	Design regulated power supplies
C207.2	Design and analyze the frequency response of amplifiers
C207.3	Simulate amplifier using SPICE
C207.4	Design and implement combinational circuits.
C207.5	Design and implement sequential circuits.

EC6312 – OOPS and Data Structures Laboratory [C208]

C208.1	Demonstrate C++ programs for manipulating stacks, queues, linked list, trees and graphs
C208.2	Able to analyze and apply good programming design methods for program development
C208.3	Execute the different data structures for implementing solutions to practical problems

MA6451 – Probability and Random Processes [C209]

C209.1	Interpret the axiomatic formulation of Probability theory and random variables as an intrinsic need for the analysis of random phenomena
C209.2	Identify probability models, function of random variables based on one & two dimensional random variables and determine regression.
C209.3	Classify the concept of random processes and to demonstrate the specific applications to Poisson and Markov Processes.
C209.4	Evaluate correlation and spectral density of stationary random processes.
C209.5	Examine the idea of linear time invariant system.


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363, Arcot Road, Kodambakkam, Chennai – 24
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EC6401 – Electronic Circuits II [C210]

C210.1	Understand the concepts and design of feedback amplifiers
C210.2	Understand the basic concepts, design and analyze RC, LC and crystal oscillators.
C210.3	Understand the performance of tuned amplifiers
C210.4	Understand the concepts of clipper, clamper and comparator circuits and multivibrators
C210.5	Understand the concepts of blocking oscillators and time base generators

EC6402 – Communication Theory [C211]

C211.1	Design AM systems.
C211.2	Design Angle modulated systems
C211.3	Apply the concepts of Random Process to the design of Communication systems
C211.4	Analyze the noise performance of AM and FM systems
C211.5	Gain knowledge in information theory and coding techniques

EC6403 – Electromagnetic Fields [C212]

C212.1	Apply vector calculus to understand the behavior of static electric fields in standard configurations
C212.2	Impart the knowledge on the concepts of conductors and dielectrics in static electric fields
C212.3	Apply vector calculus to understand the behavior of magnetic fields in standard configurations
C212.4	Explain about how materials affect magnetic fields
C212.5	Analyze the Maxwell's equation in different forms (Differential & Integral) and apply them to diverse engineering problems and also imparts knowledge about the electromagnetic wave propagation in lossless and lossy media

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EC6404 – Linear Integrated Circuits [C213]

C213.1	Understand the basic blocks of LIC
C213.2	Design various linear and non-linear circuits using OP-AMP
C213.3	Understand theory and applications of analog multiplier and PLL
C213.4	Understand the theory of ADC and DAC
C213.5	Design waveform generators and understand special function ICs

EC6405 – Control System Engineering [C214]

C214.1	Understand the methods of representation of systems and getting their transfer function models for analysis of physical systems and to introduce the control system components
C214.2	Provide adequate knowledge in the time response of systems and steady state error analysis and to introduce the effects of controllers
C214.3	Give basic knowledge in obtaining the open loop and closed loop frequency responses of systems and to study the design of compensators
C214.4	Understand the concept of stability of control system and methods of stability analysis
C214.5	Introduce state variable representation of physical systems

EC6411 – Circuit and Simulation Integrated Laboratory [C215]

C215.1	Analyze various types of feedback amplifiers
C215.2	Design oscillators, tuned amplifiers and multivibrators
C215.3	Demonstrate the various types of blocking oscillators
C215.4	Simulate oscillators, tuned amplifiers, wave shaping circuits and multivibrators using SPICE tool.
C215.5	Perform voltage and current time base circuits using PSPICE Tool.


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EC6412 – Linear Integrated Circuit Laboratory [C216]

C216.1	Design and simulate amplifiers, oscillators using operational amplifiers.
C216.2	Design and simulate filters using op-amp and analyse its frequency response
C216.3	Analyze the working of PLL and its application as a frequency multiplier.
C216.4	Design DC power supply using ICs.
C216.5	Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE.

EC6461 – Electrical Engineering and Control System Laboratory [C217]

C217.1	Perform experiments to study the load characteristics of DC Motors/Generators
C217.2	Design bridge network circuit to measure the values of passive component
C217.3	Analyse the stability of linear system through simulation software
C217.4	Design transfer function of DC generators
C217.5	Estimate the effect of P,PI,PID controllers using MATLAB or equivalent software

EC6501 – Digital Communication [C301]

C301.1	Gain knowledge in sampling and quantization
C301.2	Design and implement base band transmission schemes
C301.3	Design and implement band pass signalling schemes
C301.4	Analyse the spectral characteristics of band pass signalling schemes and their noise performance
C301.5	Design error control coding schemes

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EC6502 – Principles of Digital Signal Processing [C302]

C302.1	Apply DFT for the analysis of digital signals and systems
C302.2	Design IIR filters
C302.3	Design FIR Filters
C302.4	Analyse finite word length effects
C302.5	Design Multi rate filters and apply adaptive filters to equalisation

EC6503 – Transmission Lines and Waveguides [C303]

C303.1	Discuss the signal propagation through transmission lines.
C303.2	Discuss the difference between low frequency transmission and propagation at Radio Frequencies.
C303.3	Analyze impedance matching techniques using stubs.
C303.4	Analyze the different types of passive filters
C303.5	Explain the usage of wave guides and cavity resonators.

EC6351 – Environmental Science and Engineering [C304]

C304.1	The knowledge gained on flora and fauna in our environment helps to know about social environment
C304.2	The students will gain knowledge on the offensive effects of pollution in day to day life
C304.3	The students will acquire knowledge on the natural resources available and their conservation
C304.4	The students will have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C304.5	The students will get knowledge about the problems faced by society due to population explosion


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EC6504 – Microprocessor and Microcontroller [C305]

C305.1	Understand architecture of 8086 and Design and implement programs on 8086 microprocessor.
C305.2	Understand signals, system bus architecture of 8086 and multiprocessor configuration.
C305.3	Design and implement interfacing of I/O circuits with 8086 microprocessor
C305.4	Understand architecture of 8051 microcontroller.
C305.5	Understand architecture of 8051 , Design and implement programs on 8051 microcontroller.

EC6511 – Digital Signal Processing Laboratory [C306]

C306.1	Simulate Linear and Circular Convolution
C306.2	Simulate FFT and IFFT algorithms
C306.3	Simulate FIR and IIR filters
C306.4	Implement programs using various addressing modes in DSP processor
C306.5	Implement signal generation and linear convolution using DSP processor

EC6512 – Communication System Laboratory [C307]

C307.1	Simulate and validate the various functional modules of a communication system
C307.2	Demonstrate their knowledge in baseband signalling schemes through implementation of digital modulation schemes
C307.3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
C307.4	Simulate end to end communication link


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EC6513 – Microprocessors and Microcontroller Laboratory [C308]

C308.1	Introduce ALP concepts and features
C308.2	Write ALP for arithmetic and logical operations in 8086 and 8051
C308.3	Differentiate Serial and Parallel Interface
C308.4	Interface different I/Os with Microprocessors
C308.5	Be familiar with MASM

MG6851 – Principles Of Management [C309]

C309.1	An understanding of the managerial functions like planning, organizing, staffing, leading & controlling
C309.2	The basic knowledge on international aspect of management
C309.3	The basic knowledge on management and its evolution
C309.4	A knowledge on budgetary control and their strategies
C309.5	A understanding of the motivational theories existing in the management

CS6303 – Computer Architecture [C310]

C310.1	Understand basic structure and operation of digital computers
C310.2	Design Arithmetic and Logic Unit
C310.3	Design and analyze pipelined control units
C310.4	Understand parallel processing architectures
C310.5	Evaluate performance of memory systems


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CS6551 – Computer Networks [C311]

C311.1	Explain the components requirement of networks and link layer service
C311.2	Classify the Media Access Control Protocols and different Internetworking
C311.3	Demonstrate various types of routing techniques
C311.4	Outline the mechanisms involved in transport layer
C311.5	Experiment with different application layer protocols

EC6601 – VLSI Design [C312]

C312.1	Understand the basic principle of MOS transistor and learn second order effects
C312.2	Design combinational circuits using various logic families
C312.3	Analyze the timing issues of sequential circuits
C312.4	Study various architectures of ALU modules
C312.5	Learn various implementation strategies for ASIC design

EC6602 – Antenna and Wave Propagation [C313]

C313.1	understand the various parameters of antenna and to understand about radiation from current element
C313.2	analyse the various types of antennas and their design procedure.
C313.3	analyse the antenna arrays and study their radiation pattern
C313.4	analyse the special antennas such as frequency independent and broadband antennas
C313.5	understand the different modes of propagation for different frequencies.

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363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC6001 – Medical Electronics [C314A]

C314A.1	Describe the basic physiology and Bio potential recording methods and their typical waveforms
C314A.2	Discuss the methods used to measure the Non electrical and Bio Chemical parameters
C314A.3	Discuss about the assist device such as Pacemaker, defibrillator, dialyzer, Heart Lung machine
C314A.4	Describe the different types of diathermy and Bio telemetry principles
C314A.5	Explore Recent trends in medical instrumentation and application of laser in medicine

EC6003 – Robotics and Automation [C314B]

C314B.1	Understand the basic concept, generation and different types of robot
C314B.2	Analyze the various drive systems of robotics
C314B.3	Understand the working principles of various sensors used in the design of robots
C314B.4	Study the concepts of different types of end effectors.
C314B.5	Understand the basic concept of dynamics and kinematics of robots & To study the various non manufacturing application of robots

EC6611 – Computer Networks Laboratory [C315]

C315.1	Demonstrate the communication between two desktop computers
C315.2	Elaborate the different protocols using socket programming
C315.3	Implement and compare the various routing algorithms experiment various simulation tools needed for communication of computers


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EC6612 – VLSI Design Laboratory [C316]

C316.1	Develop the HDL code for basic as well as advanced digital integrated circuits
C316.2	Import the logic modules into FPGA Boards
C316.3	Perform the Synthesization, Place and Route the digital IPs.
C316.4	Design, Simulate and Extract the layouts of Analog IC block using EDA tools
C316.5	Simulate the modern chip manufacturing software tools

GE6674 – Communication and Soft Skills - Laboratory Based [C317]

C317.1	Take international examination such as IELTS and TOEFL.
C317.2	Make presentations and Participate in Group Discussions
C317.3	Successfully answer questions in interviews

EC6701 – RF and Microwave Engineering [C401]

C401.1	Represent the multiport network using scattering matrix and analyze the multiport network.
C401.2	Analyze the stability of RF amplifier for various source and load impedances.
C401.3	Discuss about active and passive Microwave devices, components, their characteristics, their working, and their applications.
C401.4	Understand the generation of microwave signals and to understand various microwave sources.
C401.5	Discuss the microwave parameters, different measurement devices.


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EC6702 – Optical Communication and Networks [C402]

C402.1	Analyse of optical fiber System and classification of Mode Theory
C402.2	Determine the Attenuation method and classify Different Types of Dispersion Method
C402.3	Analyse optical sources and fiber Amplifiers Technique
C402.4	Understand Optical Receivers and measuring Technique
C402.5	Understand Application of Different optical Network Systems

EC6703 – Embedded and Real Time Systems [C403]

C403.1	Understand the basic characteristics, Design and classification of embedded system.
C403.2	Understand the basic concepts of bus protocols, interrupts, memory and I/O devices.
C403.3	Understand the programming concepts of embedded system.
C403.4	Develop real time algorithm for task scheduling.
C403.5	Discuss the design of various real time application of embedded system and various tools for building RTOS.

IT6005 – Digital Image Processing [C404A]

C404A.1	Discuss fundamentals of Digital image and components of image processing system .
C404A.2	Apply image enhancement techniques using time and frequency domain.
C404A.3	Apply image restoration and segmentation techniques.
C404A.4	Use image compression models and techniques and apply concepts of wavelets.
C404A.5	Represent features of images and able to recognize.


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EC6004 – Satellite Communication[C404B]

C404B.1	Analyze the satellite orbits.
C404B.2	Analyze the earth segment and space segment.
C404B.3	Analyze the satellite Link design
C404B.4	Analyze the Multiple Access Methods
C404B.5	Apply the basics of satellite Networks and design of satellite application

EC6007 – Speech Processing [C405A]

C405A.1	Understand the Fundamentals of speech production
C405A.2	Explain Distortion measures and time alignment
C405A.3	Implement Hidden Markov Models
C405A.4	Deal with the issues in speech recognition and explain the concept of text to speech synthesis
C405A.5	Apply the knowledge of Speech processing in real time applications

EC6011 – Electromagnetic Interference & Compatibility [C405B]

C405B.1	Understand the basic concept of EMI / EMC related to product design & development
C405B.2	Analyze the different EM coupling principles and its impact on performance of electronic system
C405B.3	Instill knowledge on the EMI coupling mechanism and its mitigation techniques
C405B.4	Impart comprehensive insight about the current EMC standards and about various measurement techniques
C405B.5	Understand basic concepts of EMIC testing methods and working principles of instruments for measurement & analysis


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EC6016 – Opto Electronic Devices [C406]

C406.1	Understand basic principles of light and semiconductor physics
C406.2	Design display devices and analyze various types of LASERS
C406.3	Design various thermal and photo detectors
C406.4	Understand different types of optoelectronic modulators
C406.5	Explore Optoelectronic Integrated Circuits

EC6711 – Embedded Laboratory [C407]

C407.1	Write programs in ARM for a specific Application
C407.2	Interface memory and Write programs related to memory operations
C407.3	Interface A/D and D/A convertors with ARM system
C407.4	Analyse the performance of interrupt
C407.5	Write programmes for interfacing keyboard, display, motor and sensor

EC6712 – Optical & Microwave Laboratory [C316]

C408.1	Different characteristics of klystron and Gunn diode
C408.2	Solve theoretical S – Parameter measurement with the practical value.
C408.3	Implement S – Matrix characterization.
C408.4	Evaluate the radiation pattern, gain and directivity of any antenna.
C408.5	Design fiber optic analog and digital link.


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EC6801 – Wireless Communication [C409]

C409.1	Analyse of Basic wireless technology
C409.2	Analyse the Large scale propagation & small scale fading
C409.3	Determine the cellular System.
C409.4	Compare multi path Mitigation techniques
C409.5	Determine the systems with Transmit / Receive Diversity in MIMO Systems Implementation & Analysis the MIMO Systems

EC6802 – Wireless Networks [C410]

C410.1	Understand the architecture, protocol stack and services offered by Wireless Local Area Networks
C410.2	Understand the basics of mobile IP networks, mechanism behind packet delivery and various routing protocols of MANETs
C410.3	Understand the TCP operation in wired networks and its extension to 3G wireless networks
C410.4	Understand the architecture of UMTS, protocol layers and various services offered by 3G networks
C410.5	Understand the motivation behind 4G evolution and various technologies developed for 4G networks

GE6075 – Professional Ethics in Engineering [C411]

C411.1	Gain awareness on human values for professional excellence and stress management
C411.2	Gain knowledge on engineering ethics, moral issues & uses of ethical theories
C411.3	Understand the role of engineers as responsible experimenters along with courses of ethics in engineering field .
C411.4	Gain awareness of responsibilities of an engineer for safety and risc along with risc benefit analysis
C411.5	Acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives


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GE6757 – Total Quality Management [C412]

C412.1	Select and apply appropriate techniques in identifying customer needs, as well as the quality impact that will be used as inputs in TQM methodologies
C412.2	Have a strategy to create and maintain a quality culture that will move the organization towards world-class status
C412.3	Understand the TQM concept and techniques for managing, controlling and improving quality at the workplace.
C412.4	Know business excellence models and be able to assess organizations performance through data collection and analysis
C412.5	Have a strategy to implement total quality practices at the workplace and effect savings on the input cost of an organization.

EC6811 – Project [C413]

C413.1	Identify challenging practical problems, solutions to cope up with present scenario of Electronics and Communication Engineering field.
C413.2	Analyse the various methodologies and technologies and discuss with team for solving the problem
C413.3	Apply technical knowledge and project management skills for solving the problem.
C413.4	Design and develop hardware and/or software for their project specific problem.
C413.5	prepare the project reports and give proper explanation during the presentation and demonstration.

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REGULATION – 2013

COURSE OUTCOMES (CO)

MA6351- Transforms and Partial Differential Equations[C201]

C201.1	To Formulate and solve partial differential equations.
C201.2	To Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

EE6301-Digital Logic Circuits-[C202]

C202.1	List the various types of number system and compare the digital logic families.
C202.2	Apply K –Map for simplification and implementation of combinational logic circuit.
C202.3	Explain the synchronous Sequential logic circuits and draw the block diagram of Shift Registers.
C202.4	Design asynchronous sequential circuits and describe the operation of Programmable Logic Devices.
C202.5	Develop the VHDL coding for combinational and Sequential logic circuits.

EE6302-Electromagnetic Theory – (C203)

C203.1	Explain the different coordinate systems, and apply Gauss's law
C203.2	Interpret the concepts of Electrostatic fields and apply boundary conditions on Electrostatic field
C203.3	Develop concepts of Magnetostatic fields and apply boundary conditions.
C203.4	Analyze the Maxwell's equations for electromagnetic fields
C203.5	Derive Electromagnetic wave equation and apply the Poynting expression.

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GE6351 – Environmental Science and Engineering (C204)

C204.1	The knowledge gained on flora and fauna in our environment helps to know about social environment
C204.2	The students will gain knowledge on the offensive effects of pollution in day to day life
C204.3	The students will acquire knowledge on the natural resources available and their conservation
C204.4	The students will have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C204.5	The students will get knowledge about the problems faced by society due to population explosion

EC6202 - Electronic Devices and Circuits – [C205]

C205.1	Draw the characteristics of various types of Diodes, design half and full wave Rectifiers.
C205.2	Compare the different configurations of BJT, draw its characteristics.
C205.3	Calculate the FET parameters, draw its frequency response characteristics.
C205.4	Design Amplifier circuits and draw frequency response characteristics.
C205.5	Develop the parameters of feedback amplifier circuit, describe different types of oscillator circuits.

EE 6303 – Linear Integrated Circuits & Applications– (C206)

C206.1	Explain the procedure for the fabrication of IC
C206.2	Summarize the DC & AC characteristics of Operational amplifier.
C206.3	Discuss the applications of Operational amplifier
C206.4	Describe the internal functional blocks of special ICs like Timer and PLL.
C206.5	Classify types of voltage regulators and describe the special ICs.

EC6361 - Electronics Laboratory – [C207]

C207.1	Find the breakdown voltage of Diode, draw the V-I characteristics of BJT.
C207.2	Draw the equivalent circuit of JFET and develop the saw tooth waveform generation using UJT
C207.3	Design the Common Emitter amplifier and draw the V-I characteristics of photo diode & photo transistor
C207.4	Compare the theoretical and practical frequency value of oscillators and measure the ripple factor of rectifier
C207.5	Show the frequency response of filters, design the multivibrators


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EE 6311 – Linear and Digital Integrated Circuits Laboratory– (C208)

C208.1	Apply Boolean functions to implement adder, subtractor circuits and convert Excess 3 to BCD, Binary to Gray code and vice versa
C208.2	Test Parity generator and checker and Design encoder decoder circuits
C208.3	Demonstrate 4 bit synchronous, asynchronous counter and Shift registers.
C208.4	Illustrate multiplexer demultiplexer circuit and apply 555 timer in Monostable and Astable operation.
C208.5	Apply OP-AMP to construct Adder, comparator, differentiator, Integrator and describe VCO, PLL characteristics.

MA6459-Numerical Methods-[C209]

C209.1	Have clear perception of the power of numerical techniques ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.
C209.2	Gain knowledge of interpolation-forward and backward.
C209.3	Solve problems in differentiation and integration.
C209.4	solve various types of initial value partial differential Equations
C209.5	Solve various types of Seidal method problems.

EE6401-Electrical Machines -I- [C210]

C210.1	Describe the coupled coil calculate the self and mutually induced emf
C210.2	Analyze the operation of transformer in different loading condition
C210.3	Explain the concept of field energy and co-energy in single and multiple excited systems
C210.4	Demonstrate the construction of D.C machines and operation of DC Generator
C210.5	Derive the performance equation of D.C motor under various load condition and analyze the braking system

CS6456-Object Oriented Programming-[C211]

C211.1	Explain the key attributes of C++ like native types and statements and implement ADT.
C211.2	Develop object oriented programs using polymorphism and data abstraction concepts.
C211.3	Design templates, construct generics and to handle exceptions.
C211.4	Develop the concept of java in creating classes, objects using arrays and control statements.
C211.5	Create packages, handle exceptions and develop multi-threaded programs.

EE 6402 – Transmission and Distribution – (C212)

C212.1	Identify the basic elements of the electric power system, generation, transmission, distribution and describe the role played by each element.
C212.2	Compute the losses, efficiency and parameters of the Transmission line.
C212.3	Analyze the Performance of Transmission Lines.
C212.4	Solve the voltage distribution in insulator strings, cables and methods to improve the same.
C212.5	Design overhead lines both Mechanical and electrical aspects using Sag calculation.

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EE6403-Discrete Time Systems and Signal Processing-[C213]

C213.1	Classify the different types of signals and systems and Explain the sampling process of continuous time signal.
C213.2	Apply z-transform and inverse Z transform and analyze discrete time systems.
C213.3	Apply Radix -2 Decimation in Time (DIT) and Decimation in Frequency (DIF)FFT Algorithm to Compute Discrete Fourier Transform.
C213.4	Explain different types of Infinite Impulse Response (IIR) filters and Finite Impulse Response (FIR) filters.
C213.5	Explain various architectures of Digital signal processors.

EE6404– Measurements and Instrumentation-(C214)

C214.1	Describe the basic functional block elements in Different measuring Instrumentsand the errors in the measurement system.
C214.2	Select the suitable instrument for measuring different electrical and magnetic parameters.
C214.3	Design a suitable Bridge circuit to determine the values of various resistor, inductor and capacitor.
C214.4	Explain the construction and working principle of various types of storage and display devices and compare them.
C214.5	Compare the various types of transducers and explain the function of differentblocks involved in data acquisition systems.

CS 6461- Object Oriented programming Laboratory-[C215]

C215.1	Design C++ programs using functions, classes with objects, member functions and constructors.
C215.2	Develop operator and function overloading and run time polymorphism using C++.
C215.3	Develop file handling techniques in C++ for sequential and random access also use Java code for strings.
C215.4	Construct packages and interfaces in Java.
C215.5	Create threads in Java and handle predefined and user defined exceptions.

EE6411-Electrical Machines Laboratory- I- [C216]

C216.1	Analyze the characteristics of DC shunt generator DC compound generator and calculate critical resistance and critical speed
C216.2	Examine load characteristics of DC shunt, series and compound motor and identify its maximum efficiency operating point
C216.3	Predict the efficiency of DC shunt machine in different methods
C216.4	Explain the load characteristics of single phase and three phase transformer , separate the different losses and to find the efficiency
C216.5	Predetermine the equivalent circuit parameters of single phase transformer using two different methods and compare the results

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EE 6501 – Power System Analysis-[C301]

C301.1	Explain the operation of various power system components, Draw the per unit diagram and form the Y-bus matrix for the power system.
C301.2	Develop the power flow equation for power system problems and Determine the line flows using G-S, N-R and F-D method
C301.3	Illustrate the types of faults and their effects, Calculate the fault currents for symmetrical fault condition.
C301.4	Draw the sequence network for L-G, L-L and L-L-G fault of the power system and Determine the fault current incase of L-G, L-L and D- L-G fault
C301.5	Explain the concept of power system stability, Analyze the stability of single machine infinite bus system.

EE 6502 – Microprocessors and Microcontrollers – (C302)

C302.1	Describe the basic Architecture of 8085 Microprocessor and working of all blocks of the processor, IO and memory interfacing with necessary timing diagrams.
C302.2	Classify the instructions with the help of Addressing modes of 8085 with necessary programs.
C302.3	Explain the basic Architecture of 8051 Microcontroller with working of various blocks of the controller like Interrupts, Timer, IO ports etc. with necessary timing diagram and compare the programming concepts with 8085.
C302.4	Analyze the architecture of various Interfacing Devices like 8255 PPI, 8259 PIC, 8251 USART, 8279, 8253, ADC and DAC and Programming of all the Interfacing IC's.
C302.5	Apply the knowledge of programming concepts of 8051 Microcontroller for various applications like keyboard display interface, servo motor etc

ME 6701 – Power Plant Engineering – (C303)

C303.1	Explain the layout, construction and working of the components inside a thermal power plant
C303.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
C303.3	Explain the layout, construction and working of the components inside nuclear power plants.
C303.4	Explain the layout, construction and working of the components inside Renewable energy power plants.
C303.5	Explain the layout, construction and working of the components inside Renewable energy power plants.

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EE6503 - Power Electronics - [C304]

C304.1	Explain the significance of switching devices and its application to power converters and demonstrate the triggering circuit and snubber circuits.
C304.2	Compare the operation of two, three Pulse Converters and draw output waveforms with and without source and load inductance.
C304.3	Classify the operation of Choppers and outline the application of SMPS.
C304.4	Analyze the operation of single phase and three phase Inverters with and without PWM techniques.
C304.5	Illustrate the operation of AC voltage controller and cycloconverter and its application.

EE6504-Electrical Machines-II-[C305]

C305.1	Draw the constructional details and explain the performance of salient and non –salient type synchronous generators.
C305.2	Draw and explain the Principle of operation and performance of synchronous motor.
C305.3	Draw and describe the construction, principle of operation and performance of induction machines.
C305.4	Describe the starting and speed control of three-phase induction motors.
C305.5	Explain the construction, principle of operation and performance of single phase induction motors and special machines.

IC6501- Control systems – (C306)

C306.1	Discuss the use of transfer function models for analysis of physical systems and the control system components.
C306.2	Analyze the time response of systems and steady state error.
C306.3	Use the basic knowledge in obtaining the open loop and closed-loop frequency responses of systems.
C306.4	Explain the stability analysis and types of compensators.
C306.5	Describe the state variable representation of physical systems and the effect of state feedback.


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EE6511- Control and Instrumentation Laboratory – (C307)

C307.1	Determine the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system by (i) Bode plot (ii) Root Locus Plot and (iii) Nyquist plot using MATLAB.
C307.2	Compute the transfer function of a Field controlled DC motor experimentally and Design the Lag, Lead and Lag-Lead Compensators for the given specifications and hook up it using RC networks.
C307.3	Draw the transient response of Position Control system experimentally, Determine the Characteristics of Synchro-Transmitter- Receiver and Use the MATLAB for the Simulation of Control Systems.
C307.4	Calculate the unknown Capacitance, Inductance and Resistance using AC and DC Bridges experimentally and Analyze the Dynamics of Sensors/Transducers (a) Temperature (b) Pressure (c) Displacement (d) Optical (e) Strain and (f) Flow.
C307.5	Measure the Power and Energy experimentally; Analyze the Signal Conditioning units (a) Instrumentation Amplifier (b) ADC and DACs and Use the MATLAB for Process Simulation.

GE6563- Communication Skills – Laboratory based – (C308)

C308.1	Apply appropriate communication skills across settings, purposes and audiences.
C308.2	Demonstrate knowledge of communication theory and applications.
C308.3	Practice critical thinking to develop innovative and well-founded perspectives related to the students emphasis. Build and maintain healthy and effective relationships.
C308.4	Use technology to communicate effectively in various settings and contexts.
C308.5	Demonstrate appropriate and professional ethical behavior.

EE6512-Electrical Machines Laboratory-II - [C309]

C309.1	Determine the voltage regulation of three phase alternator in different methods and compare the results
C309.2	Determine the voltage regulation of salient pole synchronous machine and find negative & zero sequence components
C309.3	Explain the V and inverted V characteristics of three phase synchronous machine at different load condition
C309.4	Determine and pre determine performance characteristics of three phase induction motor
C309.5	Determine and pre determine performance characteristics of single phase induction motor


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EC6651-Communication Engineering - (C310)

C310.1	Explain the operation of Amplitude Modulation , draw the frequency spectrum and vector representation of AM
C310.2	Compare the different methods of QPSK, BFSK and GMSK
C310.3	Analyze how information is transmitted to receiver using the Huffman coding
C310.4	Discuss about the various types of multiple access techniques
C310.5	Distinguish between INTELSAT and INSAT

EE6601– Solid State Drives – (C311)

C311.1	Classify the various types of drives and load torque characteristics and Apply themulti quadrant dynamics in hoist load system.
C311.2	Analyze the operation of steady state analysis of single phase and three phase fully controlled converter and Chopper fed separately excited dc motor drives and discuss the various control strategies of converter.
C311.3	Explain the operation and characteristics of various methods of solid state speed control of induction motor.
C311.4	Describe the operation of various modes of V/f control of synchronous motor drivesand different types of permanent magnet synchronous motor drives.
C311.5	Design a current and speed controller and develop the transfer function for DCmotor, load and converter, closed loop control with current and speed feedback.

EE 6602 – Embedded Systems – (C312)

C312.1	Analyze the basic build process of embedded systems, structural units in embedded processor and selection of processor and memory devices depending upon the applications.
C312.2	Classify the types of I/O device ports and buses and different interfaces for data transfer.
C312.3	Model the Embedded Product Development Life Cycle (EDLC) by using different techniques like state machine model, sequential program model and concurrent model
C312.4	Analyze the basic concept of Real Time Operating Systems and plan to schedulingof different task and compare the features of different types of Real Time Operating Systems
C312.5	Apply the knowledge of programming concepts of Embedded Systems for various applications like Washing Machine automotive and Smart Card System applications


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363, Arcot Road, Kodambakkam, Chennai – 24
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Website : www.msec.edu.in

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EE 6603 – Power System Operation and Control - (C313)

C313.1	Analyze the various load characteristics with load curve and load duration curve.
C313.2	Describe modeling of power-frequency dynamics and design power-frequency controller
C313.3	Explain the modeling of reactive power-voltage interaction and the control actions
C313.4	Solve economic dispatch problems and unit commitment problems in power systems
C313.5	Explain the need of computer controls to energy management using SCADA

EE 6604 - Design of Electrical Machines [C314]

C314.1	Compare Electrical Engineering materials; determine heat dissipation due to Conduction, convection and radiation.
C314.2	Calculate mmf for slots and teeth, apparent flux density, main dimensions and winding details of DC machines.
C314.3	Design core, yoke, winding and cooling system of transformers.
C314.4	Develop output equation of AC machines, design stator and rotor of induction machines.
C314.5	Design stator and rotor of synchronous machines analyze their thermal behavior, design field systems for turbo alternators.

EE6002-Power System Transients - (C315E3)

C315E3.1	Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system.
C315E3.2	Illustrate the importance of switching transients, Explain the concept of resistance switching, load switching and capacitance switching.
C315E3.3	Explain the concept of lightning mechanism, Describe the interaction between lightning and power system
C315E3.4	Apply the concept of reflection and refraction, Draw the Bewley Latticediagram for different systems.
C315E3.5	Analyze the concept of short line (or) Kilometric fault and justify the EMTPfor transient computation.

EE6611-Power Electronics and Drives Laboratory – (C316)

C316.1	Draw the VI characteristics of SCR and generate the Gate Pulse using R, RC andUJT.
C316.2	Plot the characteristics of MOSFET and IGBT
C316.3	Simulate a single phase AC to DC half and fully controlled converter.
C316.4	Draw the output response of step up and step down MOSFET based chopper and simulate a single phase IGBT based PWM inverter.
C316.5	Plot the output response of AC voltage controller and simulate the Power Electronic Circuits.

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EE 6612 – Microprocessors and Microcontrollers Laboratory – (C317)

C317.1	Predict the smallest/ largest number from a given array and to Perform various mathematical operations using 8085 processor
C317.2	Convert the given analog input to digital value and to control the traffic signals using 8085 programming
C317.3	Develop coding to display the given word using keyboard and display controller and for serial communication
C317.4	Manipulate the basic operations involving jumps and loops using 8051 Microcontroller and to interface stepper motor and other devices
C317.5	Design circuits for implementing real time applications

EE 6613 – Presentation Skills and Technical Seminar – (C318)

C318.1	Present seminar in the field of electrical and electronics engineering subjects studied.
C318.2	Solve objective type questions in the field of electrical and electronics engineering.
C318.3	Communicate effectively, the subjects learned in the form of seminar presentation.
C318.4	Communicate effectively, the modern trends in the field of electrical and electronics engineering.
C318.5	Answer effectively during technical interviews.

EE6701- High Voltage Engineering- (C401)

C401.1	Identify the causes of over voltage and its effects in power system.
C401.2	Classify the breakdown Mechanisms in Solid, Liquid, gases and Composite dielectrics
C401.3	Design different type of Generating circuit for high voltage D.C and high voltage A.C
C401.4	Measure A.C and D.C high voltage and current using appropriate method
C401.5	Test the transformer ,insulator , circuit breakers, surge diverters and cables also discuss the insulation coordination


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EE6702- Protection and Switchgear - [C402]

C402.1	Summarize the causes and effects of faults in power system and explain the necessity of protection in power system.
C402.2	Describe the operation of electromagnetic relays and draw their characteristic curves.
C402.3	List out the various faults that can occur on alternator, transformer, busbar and transmission line and select the suitable protection schemes.
C402.4	Synthesize the static relays using comparators and explain numerical relays.
C402.5	Derive the expression for RRRV, critical resistance value and compare the various types of circuit breakers.

EE6703-Special Electrical Machines - [C403]

C403.1	Explain the necessity to improve the saliency of synchronous reluctance motor and its characteristics
C403.2	Compare the various methods of excitation of different types of stepper motor and its driver circuits
C403.3	Describe the operation of switched reluctance motor with and without sensors
C403.4	Explain the electronic commutation of permanent magnet brushless D.C. motors and develop the torque equation.
C403.5	Develop the expression for emf and torque of permanent magnet synchronous motors and discuss power controller for permanent magnet synchronous motors.

MG6851-Principles of Management - [C404]

C404.1	An understanding of the managerial functions like planning, organizing, staffing, leading & controlling
C404.2	The basic knowledge on international aspect of management
C404.3	The basic knowledge on management and its evolution
C404.4	A knowledge on budgetary control and their strategies
C404.5	A understanding of the motivational theories existing in the management


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EE 6704 – Biomedical Instrumentation – (C405E2)

C405E2.1	Identify the functions of human nervous system and describe the basic components of biomedical system.
C405E2.2	Illustrate the measurement of non-electrical parameters in human body system.
C405E2.3 A	Apply different electrodes and amplifiers in physiological measurements (EEG, ECG, EMG etc.)
C405E2.4	Explain the basic principles of imaging techniques and patient monitoring system.
C405E2.	Describe the functions of life assisting and therapeutic equipments

EE6008 – Micro Controller Based System Design – [C406E4]

C406E4.1	Describe the basic architecture of PIC16cxx and apply the instruction set for simple operations.
C406E4.2	Explain about the PIC micro controllers interrupts and write the interrupt programs
C406E4.3	Apply the program to interface I/O devices with controller like LCD, Keyboard, and Sensors etc.,
C406E4.4 D	Develop simple applications using ARM assembly language programs
C406E4.5 A	Analyze ARM Organization and ARM Coprocessor interface

EE 6711 – Power System Simulation Laboratory – [C407]

C407.1	Determine the bus impedance and admittance matrices using C and MATLAB
C407.2	Apply numerical methods for solving load flow problems and verify using C and MATLAB
C407.3	Analyze various faults occurring in power system and simulate the faults using PSCAD.
C407.4	Analyze small signal stability of Single Machine Infinite Bus (SMIB) system and draw the swing curve using AUPower Lab and MATLAB.
C407.5	Generate the coding for economic dispatch problems and load frequency dynamics problems using MATLAB.

EE6712 -Comprehension- [C408]

C408.1	Describe the basic concepts of electrical and electronics subjects.
C408.2	Solve objective type questions in the field of electrical and electronics engineering
C408.3	Review, prepare and present technological developments
C408.4	Analyze the modern trends in the field of electrical and electronics engineering.
C408.5	Answer effectively during technical interviews.


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EE6801-Electric Energy Generation, Utilization and Conservation – [C409]

C409.1	Evaluate tractive effort for the propulsion of train, name the traction motors, list the traction motor control, track equipment and collection gear.
C409.2	Categorize different light sources and design various illumination systems for the indoor lighting schemes, factory lighting, halls, outdoor lighting schemes, floodlighting, street lighting.
C409.3	Compare the different methods of electric heating and types of electric welding.
C409.4	Estimate average solar radiation and illustrate the physical principles of the conversion of solar radiation into heat.
C409.5	Analyze aerodynamic forces acting on the blade and draw basic components of a WECS.

EE 6009 – Power Electronics for Renewable Energy Systems – (C410E1)

C410E1.1	Discuss and analyze the various types of renewable energy sources
C410E1.2	Analyze the performance of IG, PMSG, SCIG and DFIG
C410E1.3	Design different power converters namely AC to DC, DC to DC and AC to AC converters for renewable energy systems.
C410E1.4	Analyze various operating modes of wind electrical generators and solar energy systems.
C410E1.5	Develop maximum power point tracking algorithms.

EE6811 – Project work [C412]

C412.1	Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electrical and electronics engineering and allied applications.
C412.2	Apply appropriate techniques and modern engineering hardware and software tools in electrical and electronics engineering and allied applications.
C412.3	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues with societal and environmental context, applying ethical principles in the field of electrical and electronics engineering and allied applications.
C412.4	Function effectively as an individual and as a member or leader in diverse teams in multidisciplinary settings and make effective presentation, and communicate effectively.
C412.5	Demonstrate the understanding of the engineering and management principles in multidisciplinary environments to engage in lifelong learning in the broadest context of technological change.


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COURSE OUTCOMES

MA6351- Transforms and Partial differential Equations [C201]

C201.1	Formulate and solve partial differential equations.
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

CS6301- Programming and Data Structure II [C202]

C202.1	Explain the fundamentals of Object Oriented Programming
C202.2	Demonstrate the concepts of data abstraction, encapsulation and inheritance
C202.3	Outline the concepts of Exception handling and templates
C202.4	Summarize about tree preliminaries and other tree structures
C202.5	Demonstrate different graph data structure algorithms

CS6302- Database Management Systems [C203]

C203.1	Design Databases for applications and use the Relational model, ER Diagrams.
C203.2	Construct DDL, DML, TCL and DCL commands for different databases with various constraints.
C203.3	Apply concurrency control and recovery mechanisms for practical Problems.
C203.4	Able to select best data storage medium for databases.
C203.5	Apply security concepts to databases

CS6303- Computer Architecture [C204]

C204.1	Understand basic structure and operation of digital computer
C204.2	Design arithmetic and logic unit
C204.3	Design and analyze pipelined control units
C204.4	Understand parallel processing architectures
C204.5	Evaluate performance of memory systems.

CS6304- Analog and Digital Communication [C205]

C205.1	Apply analog communication techniques.
C205.2	Apply digital communication techniques
C205.3	Use data and pulse communication techniques
C205.4	Analyze Source and Error control coding
C205.5	Utilize multi-user radio communication


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GE6351- Environment Science and Engineering [C206]

C206.1	Gain knowledge on flora and fauna in our environment helps to know about social environment.
C206.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C206.3	Acquire knowledge on the natural resources available and their conservation.
C206.4	Gain adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming.
C206.5	Get knowledge about the problems faced by the society due to population explosion.

IT6311- Programming and Data Structure Laboratory II [C207]

C207.1	Select good programming design methods for program development.
C207.2	Develop C++ programs for object oriented concepts.
C207.3	Develop C++ programs for handling exceptions.
C207.4	Develop C++ programs for practical problems using non-linear data structures.
C207.5	Develop recursive programs using trees and graphs.

IT6312- Database Management Systems Laboratory [C208]

C208.1	Infer database language commands to create simple database
C208.2	Analyze the database using queries to retrieve records
C208.3	Applying PL/SQL for processing database
C208.4	Analyze front end tools to design forms, reports and menus
C208.5	Develop solutions using database concepts for real time requirements.

IT6313- Digital Communication Laboratory [C209]

C209.1	Design and implement different modulation and demodulation techniques
C209.2	Analyse digital modulation techniques by using MAT Lab tools
C209.3	Able to perform channel coding.

MA6453- Probability and Queueing Theory [C210]

C210.1	Interpret the axiomatic formulation of Probability theory and random variables as an intrinsic need for the analysis of random phenomena
C210.2	Identify probability models, function of random variables based on one & two dimensional random variables and determine regression.
C210.3	Classify the concept of random processes and to demonstrate the specific applications to Poisson and Markov Processes.
C210.4	Examine the specific applications of queuing models.
C210.5	Illustrate the networks ideas and series queues.


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EC6504- Microprocessor and Microcontroller [C211]

C211.1	Understand architecture of 8086 and Design and implement programs on 8086 microprocessor
C211.2	Understand signals ,system bus architecture of 8086 and microprocessor configuration
C211.3	Design and implement interfacing of I/O circuits with 8086 microprocessor
C211.4	Understand architecture of 8051 microcontroller.
C211.5	Understand architecture of 8051 microcontroller, Design and implement programs on 8051 microcontroller

CS6402- Design and Analysis of Algorithms [C212]

C212.1	Analyse the complexity of algorithms for various computing problems
C212.2	Design and analyse solutions to problems based on Brute Force and Divide and Conquer approaches
C212.3	Design and analyse solutions to problems based on dynamic programming and greedy approach
C212.4	Design and analyse solutions to problems based on iterative improvement method
C212.5	Modify existing algorithms to improve efficiency.

CS6401- Operating Systems [C213]

C213.1	Explain the basic concepts, functions of Operating Systems and system calls
C213.2	Outline various threading models, process synchronization, Compare the performance of various CPU scheduling algorithms and deadlocks
C213.3	Compare and contrast various memory management schemes
C213.4	Explain I/O management and file systems
C213.5	Model Linux multifunction server and utilize local network services

CS6403- Software Engineering [C214]

C214.1	Explain the software engineering process and project management
C214.2	Demonstrate software requirements and analysis
C214.3	Outline the software design process and user interface
C214.4	Compare and contrast various software testing
C214.5	Discuss about the software integration and project management

IT6411- Microprocessor and Microcontroller Lab [C215]

C215.1	Introduce ALP concepts and features.
C215.2	Write ALP for arithmetic and logical operations in 8086 and 8051.
C215.3	Differentiate serial and parallel interface.
C215.4	Interface different I/Os with Microprocessors
C215.5	Be familiar with MASM


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IT6412- Operating Systems laboratory [C216]

C216.1	Implement Unix commands and shell programming
C216.2	Implement various CPU Scheduling Algorithms
C216.3	Implement Process Creation and Inter Process Communication.
C216.4	Implement Deadlock Avoidance and Deadlock Detection Algorithms
C216.5	Implement Page Replacement Algorithms and File Organization , File Allocation Strategies

IT6413- Software Engineering Lab [C217]

C217.1	Identify the requirements according to the objective.
C217.2	Use open source case tools to design a software system
C217.3	Design the individual module of the given project.
C217.4	Make the design using modeling diagram
C217.5	Demonstrate software development from design.

CS6551- Computer Networks [C301]

C301.1	Explain the components requirement of networks and link layer services.
C301.2	Classify the Media Access Controls Protocols and different Interworking
C301.3	Demonstrate various types of routing techniques.
C301.4	Outline the mechanism involved in transport layer.
C301.5	Experiment with different applications layer protocols.

IT6501- Graphics And Multimedia [C302]

C302.1	Model and transform 2D objects for raster graphics system.
C302.2	Model, transform and animate 3D objects for raster graphics system.
C302.3	Able to store and retrieve various multimedia data objects from multimedia database.
C302.4	Aware of various available compression algorithms, file formats, multimedia devices and storages techniques.
C302.5	Aware of hypermedia creation and communication.

CS6502- Object Oriented Analysis And Design [C303]

C303.1	Design and implement projects using OO concepts
C303.2	Use UML analysis and design diagram
C303.3	Apply appropriate design patterns
C303.4	Create code free design
C303.5	Compare and contrast various testing techniques


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IT6502- Digital Signal Processing [C304]

C304.1	Apply DFT for the analysis of digital signals and systems
C304.2	Design IIR and FIR filters
C304.3	Characterize finite word length effects on filters
C304.4	Design the Multi rate filters
C304.5	Apply adaptive filters to equalization

IT6503- Web Programming [C305]

C305.1	Design Web pages.
C305.2	Apply object oriented aspects to scripting
C305.3	Create databases with connectivity using JDBC
C305.4	Build web based application using servlets
C305.5	Use technologies of web programming

EC6801- Wireless Communication [C306]

C306.1	Analysis of Basic wireless technology
C306.2	Analysis the Large scale propagation & small scale fading
C306.3	Determine the cellular System.
C306.4	Comparison of multi path Mitigation techniques
C306.5	Determine the systems with Transmit / Receive Diversity in MIMO Systems Implementation & Analysis the MIMO Systems

IT6511- Networks Laboratory [C307]

C307.1	Implement protocols of various layers.
C307.2	Analyse various routing algorithms.
C307.3	Use simulation tools.

IT6512- Web Programming Laboratory [C308]

C308.1	Design Web pages using HTML/DHTML and style sheets
C308.2	Design and Implement database applications.
C308.3	Create dynamic web pages using server side scripting.
C308.4	Write Client Server applications.
C308.5	Write applications using .net and RMI
C308.6	To create web service applications.


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IT6513- Case Tools Laboratory [C309]

C309.1	Make use of object oriented and design concepts to solve a given problem specifications
C309.2	Identify and map basic software requirements in UML mapping.
C309.3	Apply design patterns to improve the software quality
C309.4	Test the compliance of the software with SRS
C309.5	Map the object oriented design to the developed code

CS6601- Distributed Systems [C310]

C310.1	Explain the distributed systems architecture, foundations and issues of distributed systems.
C310.2	Outline the inter process communication in distributed systems.
C310.3	Explain the file accessing model and various services in distributed system.
C310.4	Demonstrate concurrency control and properties of transaction in Distributed systems.
C310.5	Discuss resource and process management in distributed system

IT6601- Mobile Computing [C311]

C311.1	Explain the basics of mobile telecommunication system
C311.2	Choose the required functionality at each layer for given application
C311.3	Identify solution for each functionality at each layer
C311.4	Use simulator tools and design Ad hoc networks
C311.5	Develop a mobile application.

CS6659- Artificial Intelligence [C312]

C312.1	Understand the various AI search algorithms (uninformed, informed, constraint satisfaction algorithms).
C312.2	Apply various knowledge representation techniques to solve real world problems.
C312.3	Demonstrate the knowledge of reasoning with certain and/or uncertain information.
C312.4	Identify various planning techniques and machine learning techniques to solve real-world problems.
C312.5	Analyse the application of expert systems.


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CS6660- Compiler Design [C313]

C313.1	Understand the different phases of compiler.
C313.2	Design lexical analyser for a sample language.
C313.3	Apply different parsing algorithms to develop the parsers for a given grammar.
C313.4	Understand syntax-directed translation and run-time environment.
C313.5	Apply code optimization techniques and design simple code generator.

IT6602- Software Architecture [C314]

C314.1	Design and understand software architecture for large scale software systems
C314.2	Identify and assess the quality attributes of a system at the architectural level
C314.3	Develop architectural alternatives for a problem and select among them
C314.4	Recognize major software architectural styles, design patterns, and frameworks
C314.5	Gain Knowledge about documenting views

GE6757- Total Quality Management [C315.E1]

C315.1	Select and apply appropriate techniques in identifying customer needs, as well as the quality impact that will be used as inputs in TQM methodologies
C315.2	Have a strategy to create and maintain a quality culture that will move the organization towards world-class status
C315.3	Understand the TQM concept and techniques for managing, controlling and improving quality at the workplace.
C315.4	Knowing business excellence models and be able to assess organizations performance through data collection and analysis
C315.5	Have a strategy to implement total quality practices at the workplace and effect savings on the input cost of an organization.

IT6611- Mobile Application Development Lab [C316]

C316.1	Design and Implement various mobile applications using emulators.
C316.2	Deploy applications to hand-held devices


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email Id: principal@msec.edu.in

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DEPARTMENT OF INFORMATION TECHNOLOGY

IT6612- Compiler Lab [C317]

C317.1	Implement the different Phases of compiler using tools
C317.2	Analyze the control flow and data flow of a typical program
C317.3	Optimize a given program.
C317.4	Generate an assembly language program equivalent to a source language

GE6674- Communication and Soft Skills - Laboratory Based [C318]

C318.1	Take international examination such as IELTS and TOEFL.
C318.2	Make presentations and Participate in Group Discussions
C318.3	Successfully answer questions in interviews

IT6701-Information Management [C401]

C401.1	Cover core relational database topics including logical and physical design and modelling.
C401.2	Students can able to design different security standards.
C401.3	Design and implement a complex information system that meets regulatory requirements; define and manage an organization's key master data entities.
C401.4	Define the various purposes for information architecture as it applies to web site development, user interaction, interface design, and content management.
C401.5	Learn recent advances in NOSQL, Big Data and related tools.

CS6701- Cryptography and Network Security [C402]

C402.1	Understand the classical encryption techniques and solve the mathematical fundamentals behind the cryptographic algorithms
C402.2	Comprehend the principles and working of block ciphers, symmetric key and public key cryptographic algorithms.
C402.3	Understand the working and usage of hash functions and digital signatures
C402.4	Describe the various network security practices and design applications
C402.5	Analyse protocols for various security objectives


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IT6702- Data Warehousing and Data Mining [C403]

C403.1	Acquire knowledge in basics of data warehousing, design and construct data warehouse.
C403.2	Learn and use different reporting and query tools.
C403.3	Understand the basics of data mining concepts and issues in various mining systems.
C403.4	Analyze and implement association and classification algorithms.
C403.5	Explore and apply various clustering algorithms and outlier analysis algorithms in appropriate problems.

CS6703- Grid and Cloud Computing [C404]

C404.1	Outline the concept of Grid and Cloud Architectures.
C404.2	Illustrate the data intensive grid service models and grid computing techniques
C404.3	Demonstrate the concept of virtualization in cloud.
C404.4	Experiment with the programming model for Hadoop and globus toolkit.
C404.5	Interpret the security models in the grid and cloud environment.

IT6004- Software Testing [C405.E2]

C405.1	Design the suitable test cases for software development in different domains
C405.2	Prepare test planning based on the document. Identify suitable tests to be carried out
C405.3	Explain the various level of testing
C405.4	Design test plans and test cases.
C405.5	Develop and validate a test plan. Make use of automatic testing tools.

IT6711- Data Mining Laboratory [C406]

C406.1	Create a Data Warehouse
C406.2	Implement Clustering methods
C406.3	Apply data mining techniques for realistic data.

IT6712- Security Lab [C407]

C407.1	Implement the cipher techniques
C407.2	Develop the various security algorithms
C407.3	Use different open source tools for network security and analysis


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IT6713- Grid and Cloud Computing Lab [C408]

C408.1	Use the grid and cloud tool kits.
C408.2	Design and implement applications on the Grid.
C408.3	Design and Implement applications on the Cloud.

IT6801- Service Oriented Architecture [C409]

C409.1	Design and implement projects using basic notations of XML.
C409.2	Build applications based on XML.
C409.3	Compare SOA with other architecture.
C409.4	Develop and manage a modern SOA services
C409.5	Develop web services using technology elements

GE6075- Professional Ethics in Engineering [C410.E3]

C410.1	The students be aware on human values for professional excellence and stress management.
C410.2	The students gain knowledge on engineering ethics, moral issues & uses of ethical theories
C410.3	The students understand the role of engineers as responsible experimenters along with courses of ethics in engineering field.
C410.4	The students will be aware of responsibilities of an engineer for safety and risks along with risk benefit analysis.
C410.5	The students will acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives.

CS6004- Cyber Forensics [C411.E4]

C411.1	Discuss the security issues of network layer and transport layer
C411.2	Apply security principles in the application layer
C411.3	Explain computer forensics
C411.4	Use forensics tools
C411.5	Analyze and validate forensics data

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IT6010-Business Intelligence [C411.E4]

C411.1	Explain the fundamentals of business intelligence.
C411.2	Link data mining with business intelligence.
C411.3	Apply various modeling techniques.
C411.4	Explain the data analysis and knowledge delivery stages.
C411.5	Apply business intelligence methods to various situations.

CS6008- Human Computer Interaction [C412.E5]

C412.1	Design Effective Dialog For HCI.
C412.2	Design Effective HCI For Individuals And Persons With Disabilities.
C412.3	Assess The Importance Of User Feedback.
C412.4	Explain The HCI Implications For Designing Multimedia/ Ecommerce/ E-Learning Web sites
C412.5	Develop Meaningful User Interface.

MG6088- Software Project Management [C412.E5]

C412.1	Identify the key activities in managing a software project
C412.2	Compare different process models.
C412.3	Concepts of requirements engineering and Analysis Modelling.
C412.4	Apply systematic procedure for software design and deployment.
C412.5	Compare and contrast the various maintenance concepts

CS6811- Project Work [C413]

C413.1	Review the literature and develop solutions for framed problem statement.
C413.2	Implement hardware and/or software techniques for identified problems.
C413.3	Test and analyses the modules of planned project.
C413.4	Write technical report and deliver presentation.
C413.5	Apply engineering and management principles to achieve project goal.


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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

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Course Outcomes

Course Name: Transforms and Partial Differential Equations (MA6351)

C201.1	Formulate and solve partial differential equations.
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

Course Name: Strength of Materials (CE6306)

C202.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C202.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C202.3	Apply basic equation of simple torsion in designing of shafts, helical spring & leaf spring
C202.4	Calculate the slope and deflection in beams using different methods.
C202.5	Analyse and design thin and thick shells for the applied internal and external pressures.

Course Name: Engineering Thermodynamics (ME6301)

C203.1	Understand and apply the concepts of equilibrium, conservation of mass and energy, principles of energy interactions to simple thermal systems.
C203.2	Understand and apply the second law and entropy principles to study simple systems like heat engines, heat pumps and refrigerators etc.
C203.3	Study the phase equilibrium diagrams of various pure substances and analyse vapor power cycles.
C203.4	Build thermodynamic relations between various thermodynamic properties to ideal and real gases.
C203.5	Study different psychrometric processes and apply the concepts of psychrometry to solve related problems.

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Course Name: Fluid Mechanics & Fluid machinery (CE6451)

C204.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C204.2	Analyse and calculate major and minor losses associated with pipe flow in piping networks.
C204.3	Understand the practical usefulness of dimensional analysis and apply in framing equations for hydraulic systems.
C204.4	Understand the construction, working principle, performance and design analysis of pumps.
C204.5	Understand the construction, working principle, performance and design analysis of turbines.

Course Name: Manufacturing Technology- I (ME6302)

C205.1	Understand the metal casting processes associated defects, merits and demerits.
C205.2	Understand arc,gas,solid state, resistance welding processes
C205.3	Analyse the process and principles of various metal forming methods
C205.4	Understand the various sheet metal and special forming processes
C205.5	Understand various methods of manufacturing plastic components.

Course Name: Electrical Drives and Control (EE6353)

C206.1	Classify types of electric drives systems based on nature of loads, control objectives, performance and reliability.
C206.2	Analyse different motor characteristics.
C206.3	Gain knowledge about DC and AC starters.
C206.4	Apply different speed control methods on DC motors
C206.5	Apply different speed control methods on AC motors


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Course Name: Manufacturing Technology Laboratory-I (ME6311)

C207.1	Understand the basic taper turning and external thread cutting
C207.2	Understand the principles of internal and eccentric turning.
C207.3	Understand the principles of knurling operation, and square head shaping.
C207.4	Understand the basic concepts hexagonal head shaping
C207.5	Understand the basic concepts of CNC programming.

Course Name: Fluid Mechanics and Machinery Laboratory (CE6461)

C208.1	Experiment with flow measurement devices like venturimeter and orifice meter.
C208.2	Percentage error in Rotometer with the actual flow rate.
C208.3	Estimate the friction and measure the frictional losses in fluid flow.
C208.4	Ability to do performance test on different hydraulic machinery such as pump.
C208.5	Ability to do performance test on different hydraulic machinery such as turbines.

Course Name: Electrical Engineering Laboratory (EE6365)

C209.1	Student will be able to Understand the characteristics of DC Machines and AC Machines.
C209.2	Student will be able to Understand the different speed control methods of DC and AC machines.
C209.3	Student will be able to analyse the Synchronous motor


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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

Course Name: Statistics & Numerical Methods (MA6452)

C210.1	Compute basic statistical analysis by identifying the tests, computing mean values, standard deviations and confidence intervals.
C210.2	Adapt Design of Experiment using Annova to test the hypothesis.
C210.3	To solve algebraic and Transcendental equations and to find dominant Eigen value of a matrix.
C210.4	Estimate the unknown intermediate values through interpolation and calculate the derivatives, the length and area of irregular objects using numerical differentiation and integration.
C210.5	Assess the initial value problems by single and multistep methods numerically.

Course Name: Kinematics of Machinery (ME6401)

C211.1	Understand various concepts of mechanism and develops mechanism to provide specific motion
C211.2	Analyse the velocity and acceleration of planar mechanisms using graphical method
C211.3	Construct the cam profile for specific follower motion
C211.4	Estimate the size of appropriate gears and gear trains for particular application
C211.5	Apply the concepts of friction to solve problems in machine elements

Course Name: Manufacturing Technology -II (ME6402)

C212.1	Introduce the theory of metal cutting and finding out cutting force in turning process
C212.2	Understand the lathe machine and its parts and various operations involved
C212.3	Familiarize with the shaper, milling and gear cutting calculations.
C212.4	Analyses various abrasive processes and operations broaching machines
C212.5	Understand the various turning and machining calculations


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Course Name: Engineering Materials and Metallurgy (ME6403)

C213.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
C213.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
C213.3	Clarify the effect of alloying elements on ferrous and non-ferrous metals.
C213.4	Summarize the properties and applications of non-metallic materials.
C213.5	Explain the testing of mechanical properties.

Course Name: Environment Science and Engineering (GE6351)

C214.1	The knowledge gained on flora and fauna in our environment helps to know about social environment
C214.2	The students will gain knowledge on the offensive effects of pollution in day to day life
C214.3	The students will acquire knowledge on the natural resources available and their conservation
C214.4	The students will have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C214.5	The students will get knowledge about the problems faced by society due to population explosion

Course Name: Thermal Engineering (ME6404)

C215.1	Apply thermodynamic concepts to different air standard cycles and analyse related problems
C215.2	Explain the functioning and features of IC engines, components and auxiliaries
C215.3	Apply thermodynamic concepts to steam nozzles, steam turbines and draw velocity diagrams of single and multi-stage turbines
C215.4	Explain working principle of various types of air compressors and solve problems
C215.5	Understand the basic concepts of different types of refrigeration and air conditioning systems and analyse related problems

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Course Name: Manufacturing Technology Laboratory-II (ME6411)

C216.1	Understand the basic milling operations.
C216.2	Understand the principle of various gear cutting operations.
C216.3	Understand the principles of various grinding operations.
C216.4	Understand the basic concepts cutting forces
C216.5	Understand the basic concepts of CNC programming.

Course Name: Thermal Engineering Laboratory-I (ME6412)

C217.1	Draw valve timing of four stroke engines and port timing of two stroke engines
C217.2	Determine flash and fire points of fuels
C217.3	Conduct experiments on single cylinder diesel engines with electrical ,mechanical and hydraulic loading and to study the performance characteristics and draw heat balance sheet
C217.4	Conduct experiments on multi cylinder petrol engines with hydraulic loading and to study the performance characteristics
C217.5	Conduct experiments on steam boiler and steam turbine and to study the performance characteristics

Course Name: Strength Of Materials Laboratory (CE6315)

C218.1	Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.
C218.2	Examine the strain measurement using Rosette strain gauge.
C218.3	Study the effect of hardening- Improvement in hardness and impact resistance of steels.
C218.4	Study the effect of Tempering- Improvement in Mechanical properties & Comparison.
C218.5	Perform microscopic examination of Hardened samples and Hardened & tempered samples


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Course Name: Computer Aided Design (ME6501)

C301.1	Demonstrate the various stages of design and manufacturing of any product
C301.2	Use modelling features of curves, surfaces and solids in designing simple components
C301.3	Build up the algorithms in making simple curves and for visualization schemes such as viewing, shading and colouring
C301.4	Carry out assembly modelling and execute assembly analysis by understanding concepts such as mating, interferences, tolerance, geometric and mass properties.
C301.5	Use Standards for computer graphics, exchanging data and images and communication between the CAD systems

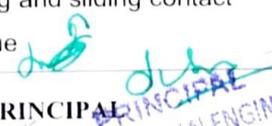
Course Name: Heat and Mass Transfer (ME6502)

C302.1	Apply heat conduction equations to different surface configuration under steady state and transient conditions and solve conduction based problems
C302.2	Apply free and forced convection heat transfer correlations to internal and external flow through/over various surface configuration and solve problems.
C302.3	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems,
C302.4	Explain basic laws for radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.
C302.5	Apply diffusive and convective mass transfer equation and correlation to solve problems for different application.

Course Name: Design of Machine Elements (ME6503)

C303.1	Explain the concepts of principal stresses, theories of failure, stress concentration and fatigue loading
C303.2	Make proper assumptions with respect to material, factor of safety and able to design shafts under fluctuating and combined loads.
C303.3	Analyse the temporary and permanent joints and design joints based on applications.
C303.4	Design different energy storing element (helical springs, compression and tension springs, flywheels) and engine components- (connecting rods and crank shafts)
C303.5	Ability to compute equivalent radial loads for rolling contact bearing and sliding contact bearing and select appropriate bearing from the standard catalogue


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Course Name: Metrology and Measurements (ME6504)

C304.1	Understand basics of metrology and their effect on precision, accuracy, errors.
C304.2	Learn about linear and angular measuring instruments, principles and applications
C304.3	Understand about advances in metrology like laser interferometers, CMM
C304.4	Learn about form measurement like straightness, flatness, roundness, thread and surface finish
C304.5	Learn about measurements of power, flow and temperature

Course Name: Dynamics of Machines (ME6505)

C305.1	Analyse forces-motion relationship in standard mechanism and to design a flywheel based on energy fluctuation
C305.2	Analyse balancing problems in rotating and reciprocating machinery and to determine the unbalance forces and couples in a system
C305.3	Understand the fundamentals of different type of vibratory motion and solve problems related to SDOF free damped and un-damped vibration systems
C305.4	Analyse the forced vibration of damped SDOF systems and understand the significance of force transmissibility and vibration isolation
C305.5	Understand the principles in mechanisms used for speed control and stability control and solve problem related to their applications

Course Name: Professional Ethics in Engineering (GE6075)

C306.1	Gain Awareness On Human Values For Professional Excellence And Stress Management
C306.2	Gain Knowledge On Engineering Ethics, Moral Issues & Uses Of Ethical Theories
C306.3	Understand The Role Of Engineers As Responsible Experimenters Along With Courses Of Ethics In Engineering Field .
C306.4	Gain Awareness Of Responsibilities Of An Engineer For Safety And Risk Along With Risk Benefit Analysis
C306.5	Acquire Knowledge On Global Issues And Able To Apply Ethical Principles To Resolve Situations That Arise In Their Professional Lives

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Course Name: Dynamics Laboratory (ME6511)

C307.1	Explain gear parameters, kinematics of mechanisms and determine mass moment of inertia of mechanical element
C307.2	Demonstrate basic concepts of balancing of forces and couples in rotating and reciprocating mechanical system
C307.3	Determine vibration response of mechanical elements
C307.4	Demonstrate working Principles of different types of governor & Gyroscopic effect on the mechanical system

Course Name: Thermal Engineering lab-II (ME6512)

C308.1	Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials.
C308.2	Conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.
C308.3	Conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.
C308.4	Conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.
C308.5	Conduct tests to evaluate the performance of refrigeration and air-conditioning test rigs.

Course Name: Metrology & Measurements Laboratory (ME6513)

C309.1	Gain knowledge about length and thickness measuring equipments
C309.2	Gain knowledge about angle measuring equipments
C309.3	Get familiar with flatness and straightness equipments.
C309.4	Gain knowledge about screw threads and gear tooth parameters
C309.5	Gain knowledge on force, torque and temperature measuring equipments


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Course Name: Design of Transmission Systems (ME6601)

C310.1	Design a power transmission system through belt, rope, and chain drive to meet desired needs in engineering applications.
C310.2	Understand Gear Terminology and Design spur and helical gear drive by considering strength and life.
C310.3	Understand the tooth terminology and apply the standard procedure for design of Bevel, Worm and Crossed Helical gears drives.
C310.4	Design of Gear box using standard step ratio, shows its speeds in stages through ray diagram and kinematic arrangement.
C310.5	Analyse and Design the Clutches, Brakes and Cam according to the requirements.

Course Name: Principles of Management (MG6851)

C311.1	An understanding of the managerial functions like planning, organizing, staffing, leading & Controlling.
C311.2	The basic knowledge on international aspect of management.
C311.3	The basic knowledge on management and its evolution.
C311.4	A knowledge on budgetary control and their strategies.
C311.5	A understanding of the motivational theories existing in the management.

Course Name: Automobile Engineering (ME 6602)

C312.1	Recognize the various parts of the automobile with their functions and materials.
C312.2	Discuss the engine auxiliary systems and engine emission control.
C312.3	distinguish the working of different types of transmission systems
C312.4	Explain the steering, brakes and suspension systems.
C312.5	Predict possible alternate source of energy for IC engines.

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Course Name: Finite Element Analysis (ME 6603)

C313.1	Understand numerical methods and analytical methods involved in Finite Element method and to understand Ritz technique and weighted residual methods for deriving finite element governing equations.
C313.2	Understand the role and significance of shape functions in finite element formulations and use linear, quadratic, and cubic shape functions for interpolation in global, local, and natural coordinates for the formulation of One-dimensional elements used to solve Structural, thermal and Eigen value problems.
C313.3	Understand the formulation of Two-dimensional elements to solve scalar variable problems.
C313.4	Understand the formulation of Two-dimensional elements to solve vector variable problems.
C313.5	Understand shape function of Isoparametric one-two dimensional, higher order elements (serendipity). Its numerical integration and its application to plane stress problems

Course Name: Gas Dynamics and Jet Propulsion (ME6604)

C314.1	Apply the concept of compressible flow in variable area ducts.
C314.2	Apply the concept of compressible flow in constant area ducts.
C314.3	Examine the effect of compression and expansion waves in compressible flow.
C314.4	Use the concept of gas dynamics in Jet Propulsion.
C314.5	Apply the concept of gas dynamics in Space Propulsion.

Course Name: Unconventional Machining Processes (ME6004)

C315A.1	Understand unconventional machining process needs
C315A.2	Understand about mechanical energy based process
C315A.3	Understand about electrical energy based process
C315A.4	Understand about chemical and electro-chemical energy based process
C315A.5	Understand about thermal energy based process


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363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University

email Id: principal@msec.edu.in

Website : www.msec.edu.in

**DEPARTMENT OF MECHANICAL ENGINEERING
(BE MECHANICAL ENGINEERING)**

Course Name: Refrigeration and Air Conditioning (ME6002)

C315B.1	Explain the basic concepts of refrigeration
C315B.2	Explain the vapor compression refrigeration system and to solve problems
C315B.3	Discuss the various types of refrigeration systems.
C315B.4	Calculate the Psychrometric properties and its use in Psychrometric processes.
C315B.5	Explain the concepts of air conditioning and to solve problems.

Course Name: CAD/CAM Laboratory (ME6611)

C316.1	Develop 2D Part and 3D Part Models using CAD Software
C316.2	Develop 3D Assembly Models using CAD Software
C316.3	Understand the CNC Control in Modern Manufacturing System
C316.4	Prepare CNC Part Programming and Perform Manufacturing

Course Name: Design and Fabrication Project (ME6612)

C317.1	Identify methods and materials to carry out experiments/develop code.
C317.2	Reorganize the procedures with a concern for society, environment and ethics.
C317.3	Design the proposed model using any CAD system and make calculations
C317.4	Analyse and discuss the results to draw valid conclusions.
C317.5	Prepare a report as per recommended format and defend the work.


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Course Name: Communication and soft Skills Lab (GE6674)

C318.1	Take international examination such as IELTS and TOEFL.
C318.2	Make presentations and Participate in Group Discussions
C318.3	Successfully answer questions in interviews

Course Name: Power Plant Engineering (ME6701)

C401.1	Explain the layout, construction and working of the components inside a thermal power plant.
C401.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
C401.3	Explain the layout, construction and working of the components inside nuclear power plants.
C401.4	Explain the layout, construction and working of the components inside Renewable energy power plants.
C401.5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

Course Name: Mechatronics (ME6702)

C402.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and computer Systems for the Control of Mechanical, Electronic Systems and sensor Technology.
C402.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.
C402.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing
C402.4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.
C402.5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies


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Course Name: Computer Integrated Manufacturing Systems (ME6703)

C403.1	Understand the concepts of CIM
C403.2	Impart knowledge about production planning and control & computerized process planning in CIM
C403.3	Understand the group technology and cellular manufacturing
C403.4	Impart knowledge about flexible manufacturing system in CIM and understand the Automated guided vehicle system
C403.5	Know about industrial robots and its programming

Course Name: Total Quality Management (GE6757)

C404.1	Select and apply appropriate techniques in identifying customer needs, as well as the quality impact that will be used as inputs in TQM methodologies
C404.2	Have a strategy to create and maintain a quality culture that will move the organization towards world-class status
C404.3	Understand the TQM concept and techniques for managing, controlling and improving quality at the workplace.
C404.4	Knowing business excellence models and be able to assess organizations performance through data collection and analysis
C404.5	Have a strategy to implement total quality practices at the workplace and effect savings on the input cost of an organization.

Course Name: Process Planning & Cost Estimation (ME6005)

C405A.1	Explain Introduction to Process Planning
C405A.2	Discuss the Process Planning Activities
C405A.3	Explain the Introduction to Cost Estimation
C405A.4	Explain the production Cost Estimation
C405A.5	Explain the Machining Time Calculation and details


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Course Name: Maintenance Engineering (ME6012)

C406A.1	Execute the principles of maintenance planning for better performance
C406A.2	Apply various preventive maintenance methods to avoid failures
C406A.3	Carry out On- load and Off -load testing through condition monitoring
C406A.4	Develop various methodologies to repair basic machine elements
C406A.5	Illustrate the repair methods for material handling equipments

Course Name: Hydraulics & Pneumatics (ME6021)

C406B.1	Explain fluid power principles and fundamentals
C406B.2	Discuss the hydraulic systems and components
C406B.3	Explain the hydraulic circuit
C406B.4	Explain the pneumatic circuit
C406B.5	Explain design hydraulic and pneumatic circuit

Course Name: Simulation & Analysis Laboratory (ME6711)

C407.1	Model and simulate simple mechanisms using MATLAB & ADAMS
C407.2	Model and analyse trusses,cables,beams with different support conditions
C407.3	Model and analyse plates and simple shells with different loading conditions
C407.4	Model and analyse axisymmetric components and cylindrical shells for thermal stresses
C407.5	Model and analyse beams for finding out natural frequencies


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Course Name: Mechatronics Laboratory (ME6712)

C408.1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems.
C408.2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers
C408.3	Understand the functioning of various types of transducers.
C408.4	Understand the functioning of image processing technique.

Course Name: Comprehension (ME6713)

C409.1	Understand and comprehend any given problem related to mechanical engineering field.
C409.2	Review, prepare and present technological development
C409.3	Analyse the modern trends in the field of mechanical engineering

Course Name: Engineering Economics (MG6863)

C410.1	Prepare accounting records and summarize and interpret the accounting data for managerial decisions.
C410.2	Understand the concept of value of engineering and apply it to practical problems
C410.3	Prepare the cash flow charts and make reports
C410.4	Carry out replacement and maintenance analysis and determine economic life of assets
C410.5	Adopt various depreciation techniques and determine economic life of assets

Course Name : Production Planning and Control (IE6605)

C411.1	Explain various production control methods which can be applied to specific situations and state their relationship to the product/process involved.
C411.2	Make forecasts in the manufacturing and service sectors using selected quantitative and qualitative techniques.
C411.3	Apply the principles and techniques for planning and control of the production and service systems to optimize/make best use of resources.
C411.4	Understand the importance and function of inventory and to be able to apply selected techniques for its control and management under dependent and independent demand circumstances
C411.5	Demonstrate and explain the use of Manufacturing Requirements Planning (MRP2), Just - In - Time (JIT) techniques in terms of operation and their importance in Lean World Class Manufacturing.


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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

Course Name: Advanced I.C Engines (ME6016)

C412.1	Explain fuel injection systems in SI engine, types of combustion chamber and combustion process
C412.2	Explain different types of fuel injection system and combustion chambers of CI engine
C412.3	Explain the mechanism of pollution formation and the evolution of emission norms
C412.4	Describe the properties of various alternative fuels, engine modification required and emission characteristic of alternative fuels
C412.5	Discuss various ignition methods used in I.C engine and electronic engine management system

Course Name: Project Work (ME6811)

C413.1	Identify a topic in advanced areas of Mechanical Engineering and Identify methods and materials to carry out experiments/develop code
C413.2	Review literature to identify gaps and define objectives & scope of the work and Reorganize the procedures with a concern for society, environment and ethics
C413.3	Generate and implement innovative ideas for social benefit Analyze and discuss the results to draw valid conclusions
C413.4	Develop prototypes/models, experimental set-up and software systems necessary to meet the objectives and Prepare a report as per recommended format and defend the work
C413.5	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings


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M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

REGULATION – 2013

COURSE OUTCOMES (CO)

MA7152 Statistical Methods for Engineers (C101)

CO CODE	COURSE OUTCOME
C101.1	Gain knowledge on the value of the point estimators using the method of moments and method of maximum likelihood.
C101.2	Conduct various test statistics in hypothesis testing for mean and variances of large and small samples.
C101.3	Determine the regression line using the method of least square and also to calculate the partial and multiple correlation coefficient for the given set of data points.
C101.4	Test the hypothesis for several means using one way, two way or three way classifications.
C101.5	Gathered knowledge on the principal component analysis of random vectors and matrices.

CN7101 Modern Construction Materials (C102)

CO CODE	COURSE OUTCOME
C102.1	Gain knowledge on the various types of special concretes
C102.2	Select the different processing of steel and applications of coating
C102.3	Knowledge on the manufacturing process and applications of polymer composites
C102.4	Identify the different flooring materials and application of façade materials
C102.5	Apply the knowledge of smart and intelligent materials in construction field

CN7102 Construction Equipment (C103)

CO CODE	COURSE OUTCOME
C103.1	Gain knowledge on planning of equipment and selection of equipment
C103.2	Attain knowledge on fundamentals of earth work operations, earth moving operations and types of earth work equipment


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C103.3	Gather knowledge on special construction equipment's
C103.4	Apply the knowledge on asphalt and concrete plants
C103.5	Apply the knowledge and select the proper materials handling equipment

CN7103 Project Formulation and Appraisal (C104)

CO CODE	COURSE OUTCOME
C104.1	Perform Formulations Of Projects
C104.2	Analyse Project Costing
C104.3	Evaluate Project Appraisal
C104.4	Apply Project Financing
C104.5	Perform Private Sector Participation & Implementation

CN7104 Quantitative Techniques in Management (C105)

CO CODE	COURSE OUTCOME
C105.1	Apply the knowledge of science and engineering fundamentals in learning the concept of operations research and its practical applicability for solving challenges in construction.
C105.2	Identify, formulate, plan and schedule construction engineering projects.
C105.3	Knowledge of financial management and cost concepts.
C105.4	Design the required man, material, equipment, cost and time as per needs by proper decision rules.
C105.5	Analyze the cost by break-even analysis and modern construction management software.


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CN7001 Advanced Concrete Technology (C106)

CO CODE	COURSE OUTCOME
C106.1	Understood the testing of concrete making materials as per IS code and admixtures
C106.2	Gain knowledge to determine the properties of fresh and hardened of concrete.
C106.3	Gather knowledge for the design of concrete mix and grade as per IS codes and ACI method.
C106.4	Attain knowledge on the application and use of special concrete.
C106.5	Gain knowledge on the methods and techniques involved in the concrete for various structures.

CN7201 Advanced Construction Techniques (C107)

CO CODE	COURSE OUTCOME
C107.1	Understood the modern construction techniques used in the sub structure construction.
C107.2	gain knowledge on the principles and concepts relevant to super structure construction for buildings
C107.3	Understand the concepts used in the construction of special structures
C107.4	Gain Knowledge on Various strengthening and repair methods for different cases.
C107.5	Gather knowledge to Identify the suitable demolition technique for demolishing a building.

CN7202 Contract Laws and Regulations (C108)

CO CODE	COURSE OUTCOME
C108.1	Design the construction contracts
C108.2	Develop a skill for the tendering process.


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M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

C108.3	Understand the duties of the arbitrator.
C108.4	Gain knowledge on the various legal requirements to be met in relation to land and construction.
C108.5	Identify and apply the provisions provided in the labour welfare schemes.

CN7203 Construction Planning, Scheduling and Control (C109)

CO CODE	COURSE OUTCOME
C109.1	Identify and estimate the activity in the construction
C109.2	Schedule the networking of activities using critical path method
C109.3	Evaluate the project budget required for the particular construction project
C109.4	Recognize the various quality control tool required in the construction industry
C109.5	Gain knowledge on the different databases that can be maintained in a construction industry using computers.

CN7204 Computer Applications in Construction Engineering and Planning (C110)

CO CODE	COURSE OUTCOME
C110.1	Gain knowledge on the use of software's in construction Industry.
C110.2	Attained knowledge to apply various optimization techniques.
C110.3	Gather knowledge to apply Deterministic and Probabilistic Inventory Models.
C110.4	Gain knowledge to analyze the scheduling concepts.
C110.5	Obtained knowledge to solve problems using simulation and ERP systems.

CN7003 System Integration in Construction (C111)

CO CODE	COURSE OUTCOME
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C111.1	Interpret the systems used for integrating a building facility
C111.2	Identify the environmental factors applicable in the design of building systems
C111.3	Analyze the working of services components such as Plumbing, Electricity and HVAC
C111.4	Plan and diagnose the maintenance factors ensuring better operation of facility
C111.5	Assess the methods to control the safety hazards in constructed facility

CN7005 Construction Project Management (C112)

CO CODE	COURSE OUTCOME
C112.1	Identify the stages involved in a project and analyze the obligatory services to be taken up while performing a construction activity.
C112.2	Apply the professional skills acquired in managing a construction project.
C112.3	Develop the ability to attain an equilibrium among Innovation, Technology and Economic feasibility.
C112.4	Cultivate an idea on effective resource utilization and identify factors affecting job productivity.
C112.5	Estimate the cost of construction project.

CN7211 Advanced Construction Engineering and Computing Techniques Laboratory (C113)

CO CODE	COURSE OUTCOME
C113.1	Compare and analyse the methods of mix proportioning and effect of admixtures in concrete
C113.2	Knowledge on the test of NDT and workability tests on concrete
C113.3	Apply the analytical techniques and graphical analysis to interpret the experimental data
C113.4	Knowledge on project data and generate reports with graphical information
C113.5	Attained the knowledge on risks involved in construction project


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M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

CN7007 Quality Control and Assurance in Construction (C201)

CO CODE	COURSE OUTCOME
C201.1	Achieved knowledge on the quality management guidelines, quality circles.
C201.2	Apply the quality standards for preparing Quality system documents.
C201.3	Understand the skill of preparing inspection procedures for quality planning.
C201.4	Gain knowledge on techniques and tools for Quality Assurance and Control in Construction Industry.
C201.5	Gather knowledge on quality improvement techniques

CN7009 Resource Management and Control in Construction (C202)

CO CODE	COURSE OUTCOME
C202.1	Identify the different types of resources in a construction industry
C202.2	Evaluate the labour productivity and the influencing factors
C202.3	Calculate the equipment output and its operation condition on construction equipment
C202.4	Knowledge in terms of cash inflow, cash outflow and balance sheet
C202.5	Categorize the time and cost related information's in a construction sector.

CN7010 Project Safety Management (C203)

CO CODE	COURSE OUTCOME
C203.1	Gain knowledge on accidents and their causes
C203.2	Gather knowledge about safety programmes safety programme job-site safety assessment
C203.3	Attain knowledge on contractual obligations
C203.4	Understood about designing for safety and safety procedures


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C203.5	Attained knowledge on owners and designers responsibility
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CN7311 Practical Training (4 Weeks) (C204)

CO CODE	COURSE OUTCOME
C204.1	Gained first-hand knowledge of practical problems in carrying out engineering tasks
C204.2	Gathered knowledge in communication and interpersonal skills
C204.3	Developed skills in facing and solving the field problems

CN7312 Project Work (Phase I) (C205)

CO CODE	COURSE OUTCOME
C205.1	Understand the problem areas in construction engineering and management
C205.2	Gain skills to prioritize the objectives for the selected research area
C205.3	Apply literature data to frame methodology of phase 2

CN7313 Seminar (C206)

CO CODE	COURSE OUTCOME
C206.1	Work on a specific technical topic in CEM domain to acquire skills of oral presentation
C206.2	Acquire technical writing abilities for seminars and conferences
C206.3	Present the topic using visual aids and interact with students

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CN7411 Project Work (Phase II) (C207)

CO CODE	COURSE OUTCOME
C207.1	Apply literature survey from phase I to implement methodology
C207.2	Experiment the process involved and analyse the results
C207.3	Provide suggestions and recommendations for the objectives of project

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DEPARTMENT OF HUMANITIES AND SCIENCE (B.E. CIVIL ENGINEERING)

REGULATION – 2017 COURSE OUTCOMES (CO)

HS8151- Communicative English [C101]

C101.1	Ability to speak/write clearly, confidently, comprehensively and communicate with one or many using appropriate.
C101.2	Ability to read and write cohesively and coherently avoiding grammatical errors ,using a wide range of vocabulary and organizing the ideas logically on a given topic.
C101.3	Interpret different genres of texts adopting various reading strategies and to write comprehensively
C101.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to write clearly in simple language.
C101.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations

MA8151- Engineering Mathematics – I [C102]

C102.1	Acquire the knowledge of Limit definition and differentiation rules to differentiate the functions.
C102.2	Examine the concepts of functions of several variables and to find extremum value of a given function
C102.3	Evaluate the integrals by using Riemann sum and Fundamental theorem of Calculus.
C102.4	Develop an ability to trace the curve and find area , volume using multiple integrals.
C102.5	Apply various techniques in solving differential equations.

PH8151-Engineering Physics [C103]

C103.1	Acquire knowledge on the basics of properties of matter and its applications,
C103.2	Develop knowledge on the concepts of laser and their applications in fibre optics communication.
C103.3	Analyse the concepts of thermal properties of materials and apply them accordingly
C103.4	Incorporate the advanced physics concepts of quantum theory and their applications
C103.5	Summarize the basics of crystals, their structures and different crystal growth techniques.

CY8151 -Engineering Chemistry (C104)

C104.1	Water treatment techniques will facilitate better understanding of engineering processes and applications for further learning
C104.2	The basics of properties of matter and its applications will gain knowledge on better understanding of Engineering Process
C104.3	The concepts of alloys and phase rule and their applications in compound formation will facilitate better applications for further learning
C104.4	The knowledge gained on engineering materials, fuels, energy sources will facilitate future learning.
C104.5	The concepts of nuclear energy, batteries will recognize different forms energy resources for suitable applications in energy sectors..



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GE8151- Problem Solving And Python Programming -[C105]

C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Demonstrate programs using simple Python statements and expressions.
C105.3	Implement control flow and functions concept in Python for solving problems.
C105.4	Use Python data structures – lists, tuples & dictionaries for representing compound data.
C105.5	Use files, exception, modules and packages in Python for solving problems.

GE8152- Engineering Graphics [C106]

C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.2	Draw orthographic projections of lines and plane surfaces.
C106.3	Draw projections of solids.
C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.

GE8161 – Problem Solving And Python Programming Laboratory – (C107)

C107.1	Write, test, and debug simple Python programs.
C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.

BS8161– Physics And Chemistry Laboratory – (C108)

C108.1	The hands on exercises undergone by the students will help them to apply physics principles of optics Outfitted with hands-on knowledge about pH and conductometric titration
C108.2	Acquire knowledge about the modulus of elasticity and able to apply them in the field The basic concepts on argentometric titration helps in Chloride estimation
C108.3	Assess the behaviour of columns, beams and failures of materials. The basic idea on Potentiometric titration will help to get the adequate knowledge on Emf measurements


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PRINCIPAL
MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in

DEPARTMENT OF HUMANITIES AND SCIENCE (B.E. CIVIL ENGINEERING)

HS8251 - Technical English (C109)

C109.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative.
C109.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C109.3	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
C109.4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings
C109.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA8251 Engineering Mathematics – II [C110]

C110.1	To find eigenvalues, eigenvectors, canonical form and inverse of a matrix.
C110.2	Estimate vector identities and interpret some integral theorems in a vector field.
C110.3	Identify and construct analytic function and application of conformal mapping.
C110.4	Apply complex integration to evaluate contour integrals.
C110.5	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions..

PH8201 Physics For Civil Engineering - [C111]

C111.1	Express knowledge on the thermal performance of buildings.
C111.2	Knowledge on the acoustic properties of buildings.
C111.3	Intreprets on various lighting designs for buildings.
C111.4	Properties and performance of engineering materials.
C111.5	Understand the Earthquake effect and other hazards of buildings.

BE8251 – Basic Electrical And Electronics Engineering – [C112]

C112.1	Explain the basic theorems used in Electrical circuits
C112.2	Understand the different components and function of electrical machines.
C112.3	Explain the fundamentals of semiconductor and applications.
C112.4	Explain the principles of digital electronics
C112.5	Impart knowledge of communication.


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



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GE8291-Environmental Science And Engineering – [C113]

C113.1	Gain knowledge on flora and fauna in our environment helps to know about social environment
C113.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C113.3	Acquire knowledge on the natural resources available and their conservation.
C113.4	Have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C113.5	Get knowledge about the Over Population, causes and Effects and the Solutions to overcome the problems due to Population.

GE8292 - Engineering Mechanics - [C114]

C114.1	Illustrate the vectorial and scalar representation of forces and to solve problems with the basic concepts of particle mechanics.
C114.2	Analyse the rigid body under static equilibrium
C114.3	Evaluate the properties of surfaces and solids such as centroid, moment of inertia, centre of gravity and mass moment of inertia
C114.4	Analyse the rigid body under dynamic equilibrium
C114.5	Solve problems involving kinetics of rigid bodies with and without friction

GE8261- Engineering Practices Laboratory – (C115)

C115.1	Study and practice on machine tools and their operations.
C115.2	Practice on carpentry tools, components and pipe connections including plumbing work.
C115.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C115.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C115.5	Analyze the characteristics of basic electronic devices.
C115.6	Elaborate on the components, gates, soldering practices

CE8211 – Computer Aided Building Drawing-[C116]

C116.1	Sketch simple figures with title block using AutoCAD software command
C116.2	Sketch curves like parabola, spiral and involute of square & circle and draw the orthographic projection of simple solids.
C116.3	Prepare orthographic projection of simple machine parts and draw a plan of residential building.
C116.4	Sketch simple steel truss and sectional views of simple solids.
C116.5	Prepare 2D multi view drawing from 3D model.


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
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REGULATION – 2017

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C102.3	Evaluate the integrals by using Riemann sum and Fundamental theorem of Calculus.
C102.4	Develop an ability to trace the curve and find area, volume using multiple integrals.
C102.5	Apply various techniques in solving differential equations.

PH8151- Engineering Physics [C103]

C103.1	Acquire knowledge on the basics of properties of matter and its applications,
C103.2	Develop knowledge on the concepts of laser and their applications in fibre optics communication.
C103.3	Analyse the concepts of thermal properties of materials and apply them accordingly
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C103.5	Summarize the basics of crystals, their structures and different crystal growth techniques.


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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



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CY8151- Engineering Chemistry[C104]

C104.1	Water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C104.2	The basics of properties of matter and its applications will gain knowledge on better understanding of Engineering Process.
C104.3	The concepts of alloys and phase rule and their applications in compound formation will facilitate better applications for further learning.
C104.4	The knowledge gained on engineering materials, fuels, energy sources will facilitate future learning.
C104.5	The concepts of nuclear energy, batteries will recognize different forms energy resources for suitable applications in energy sectors..

GE8151- Problem Solving &Python Programming [C105]

C105.1	Develop algorithmic solutions to simple computational problems
C105.2	Demonstrate programs using simple Python statements and expressions.
C105.3	Implement control flow and functions concept in Python for solving problems.
C105.4	Use Python data structures – lists, tuples & dictionaries for representing compound data.
C105.5	Use files, exception, modules and packages in Python for solving problems.

GE8152- Engineering Graphics [C106]

C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.2	Draw orthographic projections of lines and plane surfaces.
C106.3	Draw projections of solids.
C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.


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363, Arcot Road, Kodambakkam, Chennai – 24
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email Id: principal@msec.edu.in

Website : www.msec.edu.in

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GE8161- Problem Solving and Python Programming Laboratory [C107]

C107.1	Write, test, and debug simple Python programs.
C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.
C107.4	Use Python lists, tuples, dictionaries for representing compound data.
C107.5	Read and write data from/to files in Python

BS 8161- Physics & Chemistry Laboratory [C108]

C108.1	The hands on exercises undergone by the students will help them to apply physics principles of optics. Outfitted with hands on knowledge about pH and conductometric titration
C108.2	Acquire knowledge about the modulus of elasticity and able to apply them in the field The basic concepts on argentometric titration helps in fluoride estimation.
C108.3	Assess the behavior of columns, beams and failures of materials The basic idea on Potentiometric titration will help the adequate knowledge EMF measurement.

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C110.4	Apply complex integration to evaluate contour integrals.


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Principal



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
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email Id: principal@msec.edu.in

Website : www.msec.edu.in

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C110.5	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions.
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PH8252-Physics for Information Science[C111]

C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics and its applications in various devices
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage
C111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
C111.5	Understand the basics of quantum structures and their applications in carbon electronics

BE8255-Basic Electrical, Electronics and Measurement Engineering[C112]

C112.1	To discuss the essentials of electric circuits and analysis.
C112.2	To discuss the basic operation of electric machines and transformers.
C112.3	To analyse the introduction of renewable sources and domestic loads
C112.4	To understand the fundamentals of electronic circuit constructions.
C112.5	To give the introduction to measurement and metering for electric circuits

GE 8291-Environmental Science & Engineering [C113]

C113.1	Gain knowledge on flora and fauna in our environment helps to know about social environment
C113.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C113.3	Acquire knowledge on the natural resources available and their conservation.
C113.4	Have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C113.5	Get knowledge about the Over Population, causes and Effects and the Solutions to overcome the problems due to Population.


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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University

email Id: principal@msec.edu.in

Website : www.msec.edu.in

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CS8251-Programming in C[C114]

C114.1	Simple applications in C using basic constructs
C114.2	Have a strategy to design and implement applications using arrays and strings
C114.3	Understand and implement applications in C using functions and pointers
C114.4	Knowing Applications in C using structures.
C114.5	Design applications using sequential and random access file processing.

GE8261-Engineering Practices Laboratory [C115]

C115.1	Study and practice on machine tools and their operations
C115.2	Ability to fabricate carpentry components and pipe connections including plumbing work
C115.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C115.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C115.5	Analyze the characteristics of basic electronic devices.

CS8261-C Programming Laboratory[C116]

C116.1	Develop C programs for simple applications making use of basic constructs, arrays and strings.
C116.2	Develop C programs involving functions, recursion, pointers, and structures.
C116.3	Design applications using sequential and random access file processing


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI 600 074



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in

Website : www.msec.edu.in

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REGULATION – 2017

HS8151 - Communicative English [C101]

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MA8151 - Engineering Mathematics I [C102]

C102.1	Acquire the knowledge of Limit definition and differentiation rules to differentiate the functions.
C102.2	Examine the concepts of functions of several variables and to find extremum value of a given function.
C102.3	Evaluate the integrals by using Riemann sum and Fundamental theorem of Calculus.
C102.4	Develop an ability to trace the curve and find area, volume using multiple integrals.
C102.5	Apply various techniques in solving differential equations.

PH8151 - Engineering Physics [C103]

C103.1	Acquire knowledge on the basics of properties of matter and its applications.
C103.2	Develop knowledge on the concepts of waves and optical devices and their applications in fibre optics.
C103.3	Analyse the concepts of thermal properties of materials and apply them accordingly.
C103.4	Incorporate the advanced physics concepts of quantum theory and their applications.
C103.5	Summarize the basics of crystals, their structures and different crystal growth techniques.


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Principal

PRINCIPAL
MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 034



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in

DEPARTMENT OF HUMANITIES AND SCIENCE
BE (ELECTRONICS AND COMMUNICATION ENGINEERING)
CY8151 - Engineering Chemistry [C104]

C104.1	Water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C104.2	The basics of properties of matter and its applications will gain knowledge on better understanding of engineering process.
C104.3	The concepts of alloys and phase rule and their applications in compound formation will facilitate better applications for further learning.
C104.4	The knowledge gained on engineering materials, fuels, energy sources will facilitate future learning.
C104.5	The concepts of nuclear energy, batteries will recognize different forms energy resources for suitable in energy sectors.

GE8151 -Problem Solving And Python Programming [C105]

C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Demonstrate programs using simple Python statements and expressions.
C105.3	Implement control flow and functions concept in Python for solving problems.
C105.4	Use Python data structures – lists, tuples & dictionaries for representing compound data.
C105.5	Use files, exception, modules and packages in Python for solving problems.

GE8152 – Engineering Graphics [C106]

C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
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C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.

GE8161 -Problem Solving And Python Programming Laboratory [C107]

C107.1	Write, test, and debug simple Python programs.
C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.

BS8161 – Physics And Chemistry Laboratory [C108]

C108.1	The hands on exercises undergone by the students will help them to apply physics principles of optics. Outfitted with hands-on knowledge about pH and conductometric titration
C108.2	Acquire knowledge about the modulus of elasticity and able to apply them in the field. The basic concepts on argentometric titration helps in Chloride estimation.
C108.3	Assess the behaviour of columns, beams and failures of materials. The basic idea on Potentiometric titration will help to get the adequate knowledge on Emf measurements


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
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Approved by AICTE & Affiliated to Anna University

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MA8251 – Engineering Mathematics - II [C110]

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C110.2	Estimate vector identities and interpret some integral theorems in a vector field.
C110.3	Identify and construct analytic function and application of conformal mapping.
C110.4	Apply complex integration to evaluate contour integrals.
C110.5	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions.

PH8253 – Physics for Electronics Engineering - [C111]

C111.1	Express their knowledge about the conducting materials and their properties.
C111.2	Interpret the fundamental knowledge about the semiconductors and able to differentiate different types of semiconductors.
C111.3	Understand the magnetic and dielectric properties of materials.
C111.4	Acquire knowledge on properties of optical materials and the functioning of optical materials for optoelectronic devices.
C111.5	Understand about the basics of quantum structures and their applications and also acquire the knowledge about the nano-electronic materials and devices for various applications.

BE8254 - Basic Electrical & Instrumentation Engineering [C112]

C112.1	The students will be able to illustrate the concept of three phase power circuits and power system
C112.2	The students will be able to illustrate the concepts in circuit model of transformers
C112.3	The students will be able to illustrate the concept in DC machines and its applications
C112.4	The students will be able to illustrate the concept in AC machines and its applications
C112.5	The students will be able to outline appropriate measuring instruments for given application


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Principal
MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
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DEPARTMENT OF HUMANITIES AND SCIENCE BE (ELECTRONICS AND COMMUNICATION ENGINEERING) EE8251 – Circuit Analysis [C113]

C113.1	Apply basic circuit laws to analyse AC and DC circuits and understand the network topologies in graph theory.
C113.2	Apply various network theorems to solve the electrical parameters for a given circuit.
C113.3	Understand the concept of resonance, inductance and coupled circuits.
C113.4	Analyse the time response of circuits with passive components using laplace transformation.
C113.5	Derive the various two port network parameters for a given circuit.

EC8252 – Electronic Devices [C114]

C114.1	To get familiar with the theory, operations of PN Junction Diode.
C114.1	To explain the construction, operations of Bipolar Junction Transistor
C114.1	To explain the constructions, operations of Field Effect Transistor.
C114.1	To illustrate the concept and operations of Special Semiconductor Diode.
C114.1	To explain the theory, operations of photo devices and power devices

EC8261 – Circuits and Devices Laboratory [C115]

C115.1	Analyze the characteristics of basic electronic devices
C115.2	Design RL and RC circuits
C115.3	Verify Thevenin & Norton theorem KVL & KCL, and Super Position Theorems
C115.4	Verify Kirchoff's law.

GE8261 – Engineering Practices Laboratory [C116]

C116.1	Study and practice on machine tools and their operations
C116.2	Ability to fabricate carpentry components and pipe connections including plumbing work. Ability to use welding equipment to join the structures.
C116.3	Understand basic house electrical wirings.
C116.4	Measure various electrical quantities like voltage, current, power, power factor, energy etc.
C116.5	Analyze the characteristics of basic electronic devices
C116.6	Elaborate on the components, gates, soldering practices


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Principal

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Principal



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363, Arcot Road, Kodambakkam, Chennai – 24

Approved by AICTE & Affiliated to Anna University

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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in

**DEPARTMENT OF HUMANITIES AND SCIENCE
(B.E. ELECTRICAL AND ELECTRONICS ENGINEERING)**

MA8251 Engineering Mathematics – II [C110]

C110.1	To find eigenvalues,eigenvectors,canonical form and inverse of a matrix.
C110.2	Estimate vector identities and interpret some integral theorems in a vector field.
C110.3	Identify and construct analytic function and application of conformal mapping.
C110.4	Apply complex integration to evaluate contour integrals.
C110.5	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions..

PH8253 Physics for Electronics Engineering - [C111]

C111.1	Express their knowledge about the conducting materials and their properties.
C111.2	Interpret the fundamental knowledge about the semiconductors and able to differentiate different types of semiconductors
C111.3	Understand the magnetic and dielectric properties of materials
C111.4	Acquire knowledge on properties of optical materials and the functioning of optical materials for optoelectronic devices.
C111.5	Understand about the basics of quantum structures and their applications and also acquire the knowledge about the nano-electronic materials and devices for various applications.

BE8252 – Basic civil and Mechanical Engineering– [C112]

C112.1	Appreciate the Civil and Mechanical Engineering components of Projects
C112.2	Explain the usage of construction material and proper selection of construction materials
C112.3	Measure distances and area by surveying.
C112.4	Identify the components used in power plant cycle. Demonstrate working principles of petrol and diesel engine.
C112.5	Elaborate the components of refrigeration and Air conditioning cycle..

EE8251 - Circuit Theory – [C113]

C113.1	Able to understand fundamental laws and analyse electrical circuits with different techniques
C113.2	Able to gain conceptual knowledge in solving circuits by applying network reduction techniques and network theorems
C113.3	Able to analyse and estimate the transient response using Laplace transform.
C113.4	Able to develop understanding of three phase circuits ,balanced and unbalanced conditions
C113.5	Able to interpret the concept of resonance and coupled circuits.


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BE8252 – Basic civil and Mechanical Engineering– [C112]

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GE8291-Environmental Science And Engineering - [C114]

C114.1	Gain knowledge on flora and fauna in our environment helps to know about social environment.
C114.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C114.3	Acquire knowledge on the natural resources available and their conservation
C114.4	Have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C114.5	Get knowledge about the Over Population, causes and Effects and the Solutions to overcome the problems due to Population

GE8261- Engineering Practices Laboratory – (C115)

C115.1	Study and practice on machine tools and their operations.
C115.2	Practice on carpentry tools, components and pipe connections including plumbing work.
C115.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C115.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C115.5	Analyze the characteristics of basic electronic devices.
C115.6	Elaborate on the components, gates, soldering practices

EE8261 – Electric circuits Laboratory -[C116]

C116.1	Able to simulate electrical circuits and to experimentally verify various theorems for circuit designing
C116.2	To gain practical knowledge regarding the frequency response and transients in passive elements.
C116.3	To be able to simulate the resonance circuits for several applications such as designing of tuning circuit, signal processing and voltage magnification.
C116.4	Perform the simulation of three phase circuits using suitable simulation for both balanced and unbalanced condition.


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DEPARTMENT OF HUMANITIES AND SCIENCE
(B.TECH. INFORMATION TECHNOLOGY)

REGULATION – 2017

COURSE OUTCOMES(CO)

HS8151-Communicative English[C101]

C101.1	Ability to speak/write clearly, confidently, comprehensively and communicate with one or many using appropriate.
C101.2	Ability to read and write cohesively and coherently avoiding grammatical errors ,using a wide range of vocabulary and organizing the ideas logically on a given topic.
C101.3	Interpret different genres of texts adopting various reading strategies and to write comprehensively.
C101.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to write clearly in simple language.
C101.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA8151-Engineering Mathematics-1[C102]

C102.1	Acquire the knowledge of Limit definition and differentiation rules to differentiate the functions.
C102.2	Examine the concepts of functions of several variables and to find extremum value of a given function.
C102.3	Evaluate the integrals by using Riemann sum and Fundamental theorem of Calculus.
C102.4	Develop an ability to trace the curve and find area , volume using multiple integrals.
C102.5	Apply various techniques in solving differential equations.

PH8151-Engineering Physics[C103]

C103.1	Acquire knowledge on the basics of properties of matter and its applications,
C103.2	Develop knowledge on the concepts of laser and their applications in fibre optics communication.
C103.3	Analyse the concepts of thermal properties of materials and apply them accordingly
C103.4	Incorporate the advanced physics concepts of quantum theory and their applications
C103.5	Summarize the basics of crystals, their structures and different crystal growth techniques.


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CY8151-Engineering Chemistry[C104]

C104.1	Water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C104.2	Gain knowledge on the basics of properties of matter and its applications.
C104.3	Acquire knowledge on the concepts of alloys and phase rule and their applications in compound formation.
C104.4	Gain Knowledge on engineering materials, fuels, energy sources will facilitate future learning.
C104.5	Have adequate knowledge on the concepts of nuclear energy, batteries and their application in energy.

GE8151-Problem Solving and Python Programming[C105]

C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Demonstrate programs using simple Python statements and expressions.
C105.3	Implement control flow and functions concept in Python for solving problems.
C105.4	Use Python data structures – lists, tuples & dictionaries for representing compound data.
C105.5	Use files, exception, modules and packages in Python for solving problems.

GE8152-Engineering Graphics[C106]

C106.1	Familiarize with the fundamentals and standards of Engineering drawings and Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.2	Draw orthographic projections of lines and plane surfaces.
C106.3	Draw projections of solids
C106.4	Draw projection of sectioned solids and development of surfaces.
C106.5	Visualize and project isometric and perspective sections of simple solids.

GE8161-Problem Solving And Python Programming Laboratory[C107]

C107.1	Write, test, and debug simple Python programs
C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.


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BS8161-Physics & Chemistry laboratory [C108]

C108.1	The hands on exercises undergone by the students will help them to apply physics principles of optics.
C108.2	Students will acquire knowledge about the modulus of elasticity and able to apply them in the field.
C108.3	Students will in a position to assess the behaviour of columns, beams and failures of materials

HS8251-Technical English[C109]

C109.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative.
C109.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C109.3	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
C109.4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
C109.5	Ability to speak/write elaborately on the ideas and opinions relevant in different situations.

MA8251-Engineering Mathematics-II[C110]

C110.1	To find eigen values, eigen vectors, canonical form and inverse of a matrix.
C110.2	Estimate vector identities and interpret some integral theorems in a vector field.
C110.3	Estimate vector identities and interpret some integral theorems in a vector field.
C110.4	Apply complex integration to evaluate contour integrals.
C110.5	Examine the concepts of Laplace transformation and solve differential equations with given boundary conditions..


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DEPARTMENT OF HUMANITIES AND SCIENCE

(B.TECH. INFORMATION TECHNOLOGY)

PH8252-Physics for Information Science[C111]

C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics and its applications in various devices
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage
C111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
C111.5	Understand the basics of quantum structures and their applications in carbon electronics

BE8255-Basic Electrical, Electronics and Measurement Engineering[C112]

C112.1	To discuss the essentials of electric circuits and analysis.
C112.2	To discuss the basic operation of electric machines and transformers.
C112.3	To analyse the introduction of renewable sources and domestic loads.
C112.4	To understand the fundamentals of electronic circuit constructions.
C112.5	To give the introduction to measurement and metering for electric circuits

IT8201-Information Technology Essentials[C113]

C113.1	Design and deploy web-sites.
C113.2	Design and deploy simple web-applications.
C113.3	Create simple database applications.
C113.4	Develop information system.
C113.5	Describe the basics of networking and mobile communications.

CS8251-Programming in C[C114]

C114.1	Simple applications in C using basic constructs
C114.2	Have a strategy to design and implement applications using arrays and strings
C114.3	Understand and implement applications in C using functions and pointers
C114.4	Knowing Applications in C using structures.
C114.5	Design applications using sequential and random access file processing.


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM, CHENNAI - 24
PRINCIPAL
PHONE NO: 044-24231111



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363, Arcot Road, Kodambakkam, Chennai – 24
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GE8261-Engineering Practices Laboratory[C115]

C115.1	Study and practice on machine tools and their operations
C115.2	Practice on carpentry tools, components and pipe connections including plumbing work
C115.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C115.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C115..5	Analyse the characteristics of basic electronic devices
C115.6	Elaborate on the components, gates, soldering practices.

CS8261-Programming in C Lab[C116]

C116.1	Develop C programs for simple applications making use of basic constructs, arrays and strings.
C116.2	Develop C programs involving functions, recursion, pointers, and structures.
C116.3	Design applications using sequential and random access file processing
C116.4	Develop applications using pointers and function.
C116.5	Develop C programs involving unions.

IT8211-Information Technology Essentials Laboratory[C117]

C117.1	Design interactive websites using basic HTML tags, different styles, links and with all Basic control elements.
C117.2	Create client side and server side programs using scripts using PHP.
C117.3	Design dynamic web sites and handle multimedia components


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DEPARTMENT OF HUMANITIES AND SCIENCE
(BE MECHANICAL ENGINEERING)

REGULATION – 2017
COURSE OUTCOMES

HS8151- Communicative English [C101]

C101.1	Ability to speak/write clearly, confidently, comprehensively and communicate with one or many using appropriate.
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C101.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to write clearly in simple language.
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MA8151- Engineering Mathematics – I [C102]

C102.1	Acquire the knowledge of Limit definition and differentiation rules to differentiate the functions.
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C102.3	Evaluate the integrals by using Riemann sum and Fundamental theorem of Calculus.
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C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.

BS 8161- Physics & Chemistry Laboratory-I [C108]

C108.1	The hands on exercises undergone by the students will help them to apply physics principles of optics. Outfitted with hands on knowledge about pH and conductometric titration
C108.2	Acquire knowledge about the modulus of elasticity and able to apply them in the field The basic concepts on argentometric titration helps in flouride estimation.
C108.3	Assess the behaviour of columns, beams and failures of materials The basic idea on Potentiometric titration will help the adequate knowledge EMF measurement.

HS8251-Technical English-II [C109]

C109.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative.
C109.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
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DEPARTMENT OF HUMANITIES AND SCIENCE
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PH8251-Materials Science [C111]

C111.1	Acquire knowledge about various phase diagrams and their applications.
C111.2	Understand about Fe-Fe ₃ C phase diagram, various microstructures of the materials and alloys
C111.3	Acquire knowledge on the mechanical properties of materials and the various testing methods.
C111.4	Gain knowledge on magnetic, dielectric and superconducting properties of materials and their applications in various fields.
C111.5	Get an insight into the basics of ceramics, composites and nanomaterials and their diverse applications.

BE8253- Basic Electrical, Electronics and Instrumentation Engineering[C112]

C112.1	Ability to understand the basic theorems used in Electrical circuits.
C112.2	To impart knowledge on Single and three phase circuits and wiring.
C112.3	Ability to Understand working principles of electrical machines
C112.4	To Understand the concepts of various electronic devices
C112.5	Ability to Choose appropriate instruments for electrical measurement for a specific application

GE 8291-Environmental Science & Engineering [C113]

C113.1	Gain knowledge on flora and fauna in our environment, helps to know about social environment
C113.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C113.3	Acquire knowledge on the natural resources available and their conservation.
C113.4	Have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming
C113.5	Get knowledge about the Over Population, causes and Effects and the Solutions to overcome the problems due to Population.


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DEPARTMENT OF HUMANITIES AND SCIENCE
(BE MECHANICAL ENGINEERING)

GE8292-Engineering Mechanics[C114]

C114.1	Illustrate the vectorial and scalar representation of forces and to solve problems with the basic concepts of particle mechanics.
C114.2	Analyse the rigid body under static equilibrium
C114.3	Evaluate the properties of surfaces and solids such as centroid, moment of inertia, centre of gravity and mass moment of inertia
C114.4	Analyse the rigid body under dynamic equilibrium
C114.5	Solve problems involving kinetics of rigid bodies with and without friction

GE8261-Engineering Practices Laboratory [C115]

C115.1	Study and practice on machine tools and their operations
C115.2	Ability to fabricate carpentry components and pipe connections including plumbing work
C115.3	Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
C115.4	Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter, measure the resistance to earth of an electrical equipment.
C115.5	Analyze the characteristics of basic electronic devices.
C115.6	Elaborate on the components, gates, soldering practices.

BE8261-Basic Electrical, Electronics & Instrumentation Engineering Laboratory[C116]

C116.1	To determine the speed characteristic of different electrical machines
C116.2	To design simple circuits involving diodes and transistors
C116.3	To use operational amplifiers


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DEPARTMENT OF CIVIL ENGINEERING

REGULATION – 2017
COURSE OUTCOMES

MA6351- Transforms and Partial Differential Equations (C201)

C201.1	Formulate and solve partial differential equations.
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

CE8301- Strength of Materials I (C202)

C202.1	Understand the behaviour of different material with its strength, stress, strain and evaluate the deformation of solids with applications to bars, beams and two dimensional state of stress and plane trusses
C202.2	Understand the different types of supports and loading also able to analyze the shear force and bending moment in beams and understand concept of theory of simple bending with the induced stress resultants, deformations and also about flitched beams and leaf springs.
C202.3	Predict sufficient knowledge to evaluate the deflection of beams by different methods and selection of method for determining slope and deflection.
C202.4	Predict the effect of torsion on shafts and springs and apply basic equation of torsion in design of circular shafts and different types of springs.
C202.5	Predict space truss and analyze the pin jointed plane and space frames

CE8302- Fluid Mechanics (C203)

C203.1	Gain knowledge about the properties of fluids like specific gravity, weight, volume and fluid statics problems in pressure measurement, forces on plane and buoyancy and flotation.
C203.2	Understand and solve the problems related to equation of motion, continuity equation and Bernoulli's theorem and its application.
C203.3	Gain knowledge about dimensional, model and prototype analysis of hydraulic structures.
C203.4	Solve the losses of flow in pipes by using Darcy and Weisbach equation.
C203.5	Understand the turbulent and boundary layer of flow to find the drag force, displacement, energy and momentum thickness.

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CE8351 – Surveying (C204)

C204.1	Gain knowledge about equipment's used in linear measurement, angular measurement and levelling.
C204.2	Work with theodolite and also understand the concepts of tacheometer to find the height and distance of the object.
C204.3	Understand the concept of different elements of geodetic measurements, control survey methodology and adjust the survey errors using various methods.
C204.4	Conduct astronomical surveying and familiar with methods to determine time, longitude, latitude and azimuth.
C204.5	Understand the concept and principle of modern surveying using advanced instruments total station and GPS.

CE8391 - Construction Materials (C205)

C205.1	Understand the properties of most common building materials such as stones, bricks and concrete blocks.
C205.2	Understand the typical and potential applications of lime, cement and aggregates and their properties.
C205.3	Understand the materials used in preparation of concrete and its mix design.
C205.4	Understand the applications of timber and other materials including their properties.
C205.5	Understand the importance of modern material for construction and their properties.

CE8392 Engineering Geology (C206)

C206.1	Understand the importance of various geological features, agencies and seismic zones in India.
C206.2	Gain a wide knowledge about the properties of various minerals and rock
C206.3	Gain knowledge about types and properties of rocks, their distribution and uses.
C206.4	Understand structure of folds, faults & joints and geophysical methods of investigation.
C206.5	Understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbour.


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CE8311 Construction Materials Laboratory (C207)

C207.1	Interpret and test the properties of fine aggregate as a construction material.
C207.2	Interpret and test the properties of coarse aggregate as a construction material.
C207.3	Interpret and test the properties of fresh concrete as a construction material.
C207.4	Interpret and test the properties of hardened concrete as a construction material.
C207.5	Interpret and test the properties of bricks, blocks and tiles as a construction material.

CE8361 Surveying Laboratory (C208)

C208.1	Acquired practical knowledge on handling survey instruments like Theodolite, Tachometer and Total station
C208.2	Determine the location of any point horizontally and vertically using Tachometry.
C208.3	Have a basic idea about foundation marking
C208.4	Record the reduced levels using various methods of levelling
C208.5	Possess knowledge about Survey field techniques

HS8381 Interpersonal Skills / Listening and Speaking (C209)

C209.1	Ability to listen and respond appropriately.
C209.2	Ability to participate in group discussions.
C209.3	Ability to make effective presentations.
C209.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to speak clearly in simple language.
C209.5	Ability to participate confidently and appropriately in formal and informal conversations.

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363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in
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MA8491 Numerical Methods (C210)

C210.1	Have clear perception of the power of numerical techniques ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.
C210.2	Gain knowledge of interpolation-forward and backward.
C210.3	Solve problems in differentiation and integration.
C210.4	solve various types of initial value partial differential Equations
C210.5	Solve various types of Seidal method problems.

CE8401 Construction Techniques and Practices. (C211)

C211.1	Understand the different construction techniques and structural systems from sub structure to super structure.
C211.2	Understand various techniques and practices such as masonry construction, flooring, and roofing.
C211.3	Know the methods and techniques involved in the construction of various types of substructures.
C211.4	Know the methods and techniques involved in the construction of various types of super structures.
C211.5	Select and understand the knowledge on operation and maintenance of different class of equipment for various engineering applications.

CE8402 Strength Of Materials II (C212)

C212.1	The different structural elements and the concept of strain energy methods and compute the deflection of determinate beams, frames and trusses using energy principles.
C212.2	Analyse propped cantilever, fixed beams and continuous beams using theorem of three moments equation for external loadings and support settlements.
C212.3	Understand the different end conditions of column and find the load carrying capacity of columns and stresses induced in columns in various methods. The students will also understand the stress action in cylinders and types of failure.
C212.4	Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure
C212.5	Understand the critical condition of loading and determine the stresses due to unsymmetrical bending of beams, locate the shear centre and to find the stresses in curved beams.

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CE8403 Applied Hydraulic Engineering. (C213)

C213.1	Design of open channels of various cross sections including economical channel sections.
C213.2	Compute water profile at different conditions
C213.3	Apply energy concepts to flow in open channel sections, Calculate energy dissipation.
C213.4	Design turbines for the given data, and to know their operation characteristics under different operating conditions.
C213.5	Design pumps for the given data, and to know their operation characteristics under different operating conditions.

CE8404 Concrete Technology (C214)

C214.1	Understand the various requirements of cement, aggregates and water for making concrete
C214.2	Gain knowledge about the effect of admixtures on properties of concrete
C214.3	Understand the concept and procedure of mix design as per IS method
C214.4	Gain knowledge about the properties of concrete at fresh and hardened state
C214.5	Understand the importance and application of special concretes

CE8491 Soil Mechanics (C215)

C215.1	Understand the classification and composition of the soil, structural arrangements of clay mineralogy, phase relationships in soil and factors affecting field and lab compaction test.
C215.2	Analyse the effective stress with and without capillary rise, permeability of soil based on darcy law with laboratory explanation of constant and variable head, seepage concept on earthen dam and flow net properties with Laplace equations.
C215.3	Evaluate the stress distribution by Boussinesq, Westergaad and Newmark chart, compute the settlement of immediate and primary, Terzaghi one dimensional equation, derivation of square root method and logarithmic time fitting method.
C215.4	Analyse the shear strength of cohesionless and cohesion soil by analytical and graphical method. Computation of shear strength by laboratory methods nad factors influencing shear strength.
C215.5	Remember the infinite slopes and finite slopes, friction circle method, Use of stability number, Guidelines for location of critical slope surface in cohesive, slope protection measures.



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CE8481 Strength of Materials Laboratory (C216)

C216.1	Understand tension test on steel rod and compression test on wood.
C216.2	Understand double shear test on metal and torsion test on mild steel rod.
C216.3	Understand Impact test on metal specimen (Izod and Charpy) and Hardness test on metals (Rockwell and Brinell Hardness Tests)
C216.4	Understand Deflection test on metal beam and Compression test on helical spring
C216.5	Understand Deflection test on carriage spring

CE8461 Hydraulic Engineering Laboratory (C217)

C217.1	Compare and interpret the knowledge of theorems and principles in hydraulic engineering.
C217.2	Detect the measurement of flow in pipes and determine the friction and minor losses.
C217.3	Gain knowledge and assess the characteristics of pumps such as discharge and power efficiency.
C217.4	Gain knowledge and assess the characteristics of turbines discharge and power efficiency.
C217.5	Understand the concept of metacentre and determine the metacentric height of a floating object.

HS8461 Advanced Reading and Writing (C218)

C218.1	Function effectively as an individual in multi-disciplinary settings.
C218.2	Able to comprehend and write effective reports.
C218.3	Write different types of essays by understanding the elements and structure of a good essay.
C218.4	Write winning job application and project report, statement of purpose and apply these in their career.
C218.5	Read and evaluate texts critically and display critical thinking in various professional contexts.

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363, Arcot Road, Kodambakkam, Chennai – 24
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Website : www.msec.edu.in
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CE8501 Design of Reinforced Cement Concrete Elements (C301)

C301.1	Understand the type of loadings and various design methods for the design of RC elements and also able to classify the section for rectangular beams.
C301.2	Analysis and design of flanged beams by limit state method and design of beams for shear, bond and torsion.
C301.3	Understand the types of loads acting on the slab and also design the various types of slabs and staircase by limit state method.
C301.4	Design columns for axial, uniaxial and biaxial eccentric loadings.
C301.5	Understand the safe bearing capacity of soil and Design the footing by limit state method

CE8502 Structural Analysis I (C302)

C302.1	Understand strain energy method and able to analyze continuous beams, pin-jointed indeterminate plane frames, rigid plane frames by strain energy method.
C302.2	Predict sway and non-sway frames and can be able to analyze the continuous beams and rigid frames by slope deflection method.
C302.3	Understand moment distribution method and will be able to analyze continuous beams and rigid frames with and without sway using moment distribution method.
C302.4	Predict about flexibility method and will be able to analyze the indeterminate pin jointed plane frames, continuous beams and rigid frames by using matrix flexibility method.
C302.5	Predict about stiffness method and will be able to analyze continuous beams, pin jointed trusses and rigid plane frames by using stiffness matrix methods.

EN8491 Water supply Engineering (C303)

C303.1	Understanding of water quality criteria and standards and their relation to public health.
C303.2	Have an insight into the structure of drinking water supply systems, including water transport, treatment and distribution.
C303.3	Have the ability to design various functional units in treatment system
C303.4	Know the detailed treatment systems involved in treating water including advanced treatment units
C303.5	Gain the ability to design and evaluate water supply distribution systems and their alternatives on basis of chosen selection criteria.

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CE8591 Foundation Engineering (C304)

C304.1	Understand the site investigations, methods and sampling with respect to foundation buildings.
C304.2	Get knowledge on bearing capacity and testing methods to find safe bearing capacity of soil based on field investigation and laboratory tests.
C304.3	Know how to design types of footings based on loads on structure and bearing capacity of soil and seismic force.
C304.4	Get knowledge how to determine the load carrying capacity and settlement of pile foundation based on field investigation and soil properties.
C304.5	Gain knowledge on earth pressure analysis and stability analysis of retaining walls.

GE8071 Disaster Management (C305)

C305.1	Differentiate the types of disasters, causes and their impact on environment and society
C305.2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
C305.3	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
C305.4	Gain knowledge on Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster
C305.5	Gain knowledge on Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

OAI551 Environment and Agriculture (C306)

C306.1	Gain knowledge on the issues of with respect to land use and land scape changes. Students able to gain the knowledge about water quality, globalization and agro eco system.
C306.2	Understand the environmental impacts with respect to erosion and deposition problems in irrigation and mechanized agriculture etc.
C306.3	Gain knowledge on the basic concepts of Climate Change, Water scarcity and water shortage.
C306.4	Understand the ecosystem, ecological diversity, farming principles and forest fragmentation.
C306.5	Understand the alternate culture systems, Mega farms and vertical farms , Agricultural environment policies and its impacts

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CE8511 Soil Mechanics Laboratory (C307)

C307.1	Identify and classify soil based on standard geotechnical engineering practice.
C307.2	Determine index properties of the soil and its behaviour
C307.3	Capable of performing laboratory compaction and in place density tests for fill quality control.
C307.4	Gain knowledge of site specific field investigations including collection of soil samples for testing and observation of soil behaviour/ building damage.
C307.5	Determine engineering properties such as shear strength, compressibility and permeability by conducting appropriate tests.

CE8512 Water and Waste Water Analysis Lab. (C308)

C308.1	Calibrate and determine the pH, turbidity, conductivity and hardness of the wastewater by using electrode and titration method.
C308.2	Understand and determine the alkalinity, acidity, chloride, available and residual chlorine and coagulation present in the wastewater by using titration method and jar test apparatus.
C308.3	Calibrate and determine the phosphates, sulphates, iron and fluoride present in the waste water sample by using spectrophotometry method.
C308.4	Determine the oil and grease, suspended, volatile and fixed solids present in the waste water sample using vacuum pump and hot air oven.
C308.5	Understand and determine the dissolved oxygen, biological and chemical oxygen demand, microscopic examination, SVI and MPN index present in the waste water using BOD and COD digester, microscope and bacteria culture test.

CE8513 Survey Camp (C309)

C309.1	Gain a thorough knowledge of preparation of contours in different terrains
C309.2	Gain a good idea of calculation of earthwork excavation.
C309.3	Apply a variety of techniques about computing large areas
C309.4	Well versed with the concept of astronomical surveying
C309.5	Capable of drawing the features of different elements along the proposal road

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CE8604 Highway Engineering (C313)

C313.1	Understand the history of road development, cross section of road, classification of roads and factors influencing highway alignment.
C313.2	Design and analyse the geometrical curves of types of horizontal and vertical, concept of super elevation, transition curves and gradients.
C313.3	Understand the pavement components and design consideration of flexible and rigid pavements as per IRS guidelines.
C313.4	Remember the properties and testing of highway materials, Quality control measures and highway drainage.
C313.5	Evaluate the pavement, maintenance of pavement, roughness, present serviceability index and skid resistance.

EN8592 Waste Water Engineering. (C314)

C314.1	Estimate sewage generation and design sewer system including sewage pumping stations and gain required understanding on the characteristics and composition of sewage.
C314.2	Perform basic design of the unit operations and processes, understand the primary treatment of sewage and methods of treatment process based on the specific composition of sewage.
C314.3	Understand the secondary process of sewage treatment and methods of selection of treatment process based on the specific composition of sewage.
C314.4	Understand the standard methods for disposal of sewage and self-purification of streams
C314.5	Gain knowledge on sludge treatment, disposal and understand the products which are recoverable from sludge treatment process.

CE8005 Air Pollution and Control Engineering (C315)

C315.1	Understand the nature, characteristics and basic concepts of air pollutants.
C315.2	Design stacks and to study the plume characteristics in relation to atmosphere
C315.3	Design and evaluate air pollutant control equipment for particulate contaminants
C315.4	Design and evaluate air pollutant control equipment for gaseous contaminants
C315.5	Identify, formulate and solve air and noise pollution problems

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CE8601 Design of Steel Structural Elements (C310)

C310.1	Understand the concepts of various design philosophies
C310.2	Design common bolted and welded connections for steel structures
C310.3	Design tension members and understand the effect of shear lag.
C310.4	Understand the design concept of axially loaded columns and column base connections
C310.5	Understand specific problems related to the design of laterally restrained and unrestrained steel beams.

CE8602 Structural Analysis II. (C311)

C311.1	Understand about the moving load, influence lines and able to analyse determinate structures for moving loads
C311.2	Identify indeterminate structures and analyse indeterminate structures for moving loads
C311.3	Understand about the arches in structural forms and can able to analyse the arches.
C311.4	Predict cables and able to analyze the cables, suspension bridge
C311.5	Understand Upper and lower bound theorems and will be able to perform plastic analysis of indeterminate beams and frames.

CE8603 Irrigation Engineering (C312)

C312.1	Understand and evaluate the crop water requirements.
C312.2	Understand the methods and management of irrigation.
C312.3	Design the Impounding structures like gravity dam, earth dam and arch dam.
C312.4	Understand the canal irrigation including canal regulators, canal drop, canal outlet and canal lining.
C312.5	Understand the water management on optimization of water use, participatory irrigation management.

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363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CE8611 Highway Engineering Laboratory. (C316)

C316.1	Understand the test on the aggregates like specific gravity, los Angeles abrasion test and water absorption of aggregates.
C316.2	Understand specific gravity of bitumen and penetration test.
C316.3	Understand viscosity test and softening point test and ductility test.
C316.4	Understand stripping test and determination of binder content and Marshall stability and flow values of bituminous mixes.
C316.5	Understand field testing equipment like skid resistance tester / Benkelbeam etc.

CE8612 Irrigation and Environmental Engineering Drawing (C317)

C317.1	Gain knowledge in the design principles and drawing of tank components and impounding structures.
C317.2	Gain knowledge in the design principles and drawing of cross drainage works and canal regulation structures.
C317.3	Design the applications of environmental engineering drawings like municipal water treatment plants.
C317.4	Design the applications of environmental engineering drawings like sewage treatment plants.

HS8581 - Professional Communication – (C318)

C318.1	To enhance the students to make effective presentations.
C318.2	To help the students participate confidently in Group Discussions.
C318.3	To motivate and prepare the students to attend job interviews and be successful in their pursuit.
C318.4	To train and develop the adequate Soft Skills required for the workplace.
C318.5	Ability to interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
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CE8701 Estimation, Costing and Valuation Engineering (C401)

C401.1	Prepare and articulate the estimation of quantities for various engineering structures.
C401.2	Organize the schedules and cost estimates for a construction project through codes and computer software.
C401.3	Prepare and articulate the specifications, reports and tender documents for a construction project.
C401.4	Understand and review the framework required to legally establish different types of contracts among stakeholders.
C401.5	Calculate the types of valuation required to assess engineering structures.

CE8702 Railways, Airports, Docks and Harbour Engineering (C402)

C402.1	Understand the elements of permanent way such as rails, sleepers, Ballast, rail fixtures and fastenings, selection of gauges, track stress, coning of wheels, creep in rails, defects in rails and to create the route alignment surveys, conventional and modern methods of geometric design of railway, gradient, super elevation, widening of gauge on curves and level crossings
C402.2	Evaluate the earthwork and stabilization of track on poor soil, track drainage, calculation of materials required for track laying, construction and maintenance of tracks in railway station and yards and passenger amenities, signalling.
C402.3	Remember the Air transport characteristics, airport classification of ICAO- airport planning and site selection of typical Airport layouts, case studies, parking and circulation area.
C402.4	Create the runway design orientation, Wind Rose Diagram, problems on basic and actual length, geometric design such as elements of taxiway design. Airport zones, passenger facilities and services like runway and taxiway markings.
C402.5	Remember the definition of basic terms of harbour, design of harbours, harbour layout and terminal facilities, coastal structures: Piers, breakwaters, wharves, jetties, Quays, spring fenders, dolphins and floating landing stage like Inland water transport and wave action on coastal Structures and coastal protection works, coastal regulation zone, 2011

CE8703 Structural Design & Drawing (C403)

C403.1	Design and draw reinforced concrete cantilever and counterfort type retaining walls.
C403.2	Understand the design and draw flat slab as per code provisions
C403.3	Understand the design and draw reinforced concrete and steel bridges
C403.4	Design and draw reinforced concrete and steel tanks.
C403.5	Design the various steel trusses and gantry girders.

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EN8591 Municipal Solid Waste Management. (C404)

C404.1	Understand the nature and characteristics of municipal solid wastes
C404.2	Understand the regulatory requirements regarding municipal solid waste management
C404.3	Plan waste minimisation and design storage, collection and transport
C404.4	Understand off site processing and equipments
C404.5	Understand disposal techniques of municipal solid waste

OML751 Testing of Materials (C405)

C405.1	The students will be able to understand the importance of material testing, Testing organizations, committee and standards.
C405.2	Students should be able to identify suitable testing technique to inspect industrial component.
C405.3	Students will be able to know the non-destructive testing methods.
C405.4	Students able to get knowledge in the material characterization testing.
C405.5	Students should know the ability to use the different technique and know its applications and limitations.

CE8711 Creative and Innovative Project. (C406)

C406.1	Come up with designs, fabrication or algorithms and programs expressing their ideas in a novel way.
C406.2	Develop a methodology to achieve the objectives..
C406.3	Demonstrate the novelty of the project through the results and outputs.

CE8712 Industrial Training (C407)

C407.1	Have a firsthand knowledge of practical problems in carrying out engineering tasks.
C407.2	Understand the problem solving methods in the field.
C407.3	Learn the text book knowledge in the field.

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GE8076 Professional Ethics in Engineering (C408)

C408.1	Gain awareness on human values for professional excellence and stress management
C408.2	Gain knowledge on engineering ethics, moral issues & uses of ethical theories
C408.3	Understand the role of engineers as responsible experimenters along with courses of ethics in engineering field .
C408.4	Gain awareness of responsibilities of an engineer for safety and risk along with risk benefit analysis
C408.5	Acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives

CE8022 Prefabricated Structures. (C409)

C409.1	Gain knowledge about design principles, layout of factory and stages of loading in precast of different elements and precast construction.
C409.2	Acquire knowledge about panel systems, slabs, connection used in precast construction and they will be in a position to design the elements.
C409.3	Gain knowledge about types of floor systems, stairs and roofs used in precast construction.
C409.4	Predict the types of walls used in precast construction, sealants, design of joints.
C409.5	Gain knowledge in behaviour of structural elements during abnormal loadings.

CE8811 Project Work (C410)

C410.1	Take up challenging practical problems and solve problems by formulating proper methodologies
C410.2	Gain knowledge of the civil engineering field and gain knowledge and be up to date with the latest technology.
C410.3	Find solutions for complex civil engineering problems.

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REGULATION-2017
COURSE OUTCOMES

MA8351 - Discrete Mathematics - [C201]

C201.1	Make use of propositions, predicates and flow of logical proofs.
C201.2	Acquire knowledge on induction and counting principles and to solve recurrence relation.
C201.3	Perceive the knowledge of various types and characteristics of graphs.
C201.4	Interpret concepts and properties of groups, rings and fields.
C201.5	Comprehends the ideas of lattices and Boolean algebra.

CS8351 - Digital Principles And System Design - [C202]

C202.1	To understand different methods used for the simplification of Boolean functions.
C202.2	To understand and design a system that uses combinational logic for the given specification; Simulate combinational logic systems using verilog or VHDL.
C202.3	To understand and design synchronous sequential system for the given specification; Simulate sequential logic systems using verilog or VHDL.
C202.4	To design and implement Asynchronous sequential system for the given specification.
C202.5	To design and implement memory accessing systems and systems using PLA, PAL.

CS8391 - Data Structures - [C203]

C203.1	Implement abstract data types for linear data structures – List.
C203.2	Implement and apply the different linear data structures to problem solutions.
C203.3	Implement and apply the non-linear data structure Tree ADT to problem solutions.
C203.4	Implement and apply the non-linear data structure Graph ADT to problem solutions.
C203.5	Critically analyse the various sorting algorithms.


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CS8392 - Object Oriented Programming - [C204]

C204.1	Develop Java programs using OOP principles.
C204.2	Develop Java programs with the concepts inheritance and interfaces.
C204.3	Build Java applications using exceptions and I/O streams.
C204.4	Develop Java applications with threads and generics classes.
C204.5	Develop interactive Java programs using AWT, Swings components with event handling.

EC8395 - Communication Engineering - [C205]

C205.1	Design AM communication systems.
C205.2	To use data and pulse communication techniques.
C205.3	Apply digital communication techniques.
C205.4	Analyze Source and Error control coding.
C205.5	An in- depth knowledge of Spread Spectrum and Multiple Access Techniques.

CS8381 - Data Structures Lab – [C206]

C206.1	Write functions to implement linear and non-linear data structure operations.
C206.2	Suggest appropriate linear / non-linear data structure operations for solving a given Problem.
C206.3	Appropriately use the linear / non-linear data structure operations for a given problem.
C206.4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.



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CS8383 - Object Oriented Programming Laboratory – [C207]

C207.1	Develop and implement Java programs for simple applications that make use of classes.
C207.2	Develop and implement Java programs for simple applications that make use of packages and interfaces.
C207.3	Develop and implement Java programs with array list, exception handling and multithreading.
C207.4	Design applications using file processing, generic programming.
C207.5	Design applications using AWT components and event handling.

EC8382 - Digital Systems Lab – [C208]

C208.1	Implement simplified combinational circuits using basic logic gates.
C208.2	Implement combinational circuits using MSI devices.
C208.3	Implement sequential circuits like registers and counters.
C208.4	Simulate combinational and sequential circuits using HDL.

HS8381 - Interpersonal Skills/Listening & Speaking – [C209]

C209.1	Ability to listen and respond appropriately.
C209.2	Ability to participate in group discussions.
C209.3	Ability to make effective presentations.
C209.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to speak clearly in simple language.
C209.5	Ability to participate confidently and appropriately in formal and informal conversations.


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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
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Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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MA8402 - Probability and Queueing Theory – [C210]

C210.1	To understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions.
C210.2	To understand the basic concepts of one and two dimensional random variables and determine correlation, regression.
C210.3	Classify the concept of random processes and to demonstrate the specific applications to Poisson and Markov Processes.
C210.4	Examine the specific applications of queueing models.
C210.5	Illustrate the network's ideas and series queues.

CS8491 - Computer Architecture – [C211]

C211.1	Understand the basics structure of computers, operations and instructions.
C211.2	Design arithmetic and logic unit.
C211.3	Understand pipelined execution and design control unit.
C211.4	Understand parallel processing architectures.
C211.5	Understand the various memory systems and I/O communication.

CS8492 - Database Management Systems – [C212]

C212.1	Classify the modern and futuristic database applications based on size and complexity.
C212.2	Map ER model to Relational model to perform database design effectively.
C212.3	Write queries using normalization criteria and optimize queries.
C212.4	Compare and contrast various indexing strategies in different database systems.
C212.5	Appraise how advanced databases differ from traditional databases.


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CS8451 - Design and Analysis of Algorithms – [C213]

C213.1	Analyze the complexity of algorithms for various computing problems.
C213.2	Design and analyse solutions to problems based on Brute Force and Divide and Conquer approaches.
C213.3	Design and analyse solutions to problems based on dynamic programming and greedy approach.
C213.4	Design and analyse solutions to problems based on iterative improvement method.
C213.5	Modify existing algorithms to improve efficiency.

CS8493 - Operating Systems – [C214]

C214.1	Explain the basic concepts .functions of Operating Systems and system calls.
C214.2	Outline various threading models, process synchronization, Compare the performance of various CPU scheduling algorithms and deadlocks.
C214.3	Compare and contrast various memory management schemes.
C214.4	Explain I/O management and file systems.
C214.5	Perform administrative tasks on Linux Servers, Compare iOS and Android Operating Systems.

CS8494 - Software Engineering – [C215]

C215.1	Explain the software process and agile development.
C215.2	Demonstrate the software requirements and analysis.
C215.3	Apply the software design procedure.
C215.4	Compare and contrast various the various software testing and implementation Techniques.
C215.5	Estimate the software project cost and effort.

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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CS8481 - Database Management Systems Laboratory – [C216]

C216.1	Use typical data definitions and manipulation commands.
C216.2	Design applications to test Nested and Join Queries.
C216.3	Implement simple applications that use Views.
C216.4	Implement applications that require a Front-end Tool.
C216.5	Critically analyze the use of Tables, Views, Functions and Procedures.

CS8461 - Operating Systems laboratory – [C217]

C217.1	Learn Unix commands and shell programming
C217.2	Implement various CPU Scheduling Algorithms
C217.3	Implement Process Creation and Inter Process Communication.
C217.4	Implement Deadlock Avoidance and Deadlock Detection Algorithms
C217.5	Implement Page Replacement Algorithms and File Organization , File Allocation Strategies

HS8461 Advanced Reading and Writing - [C218]

C218.1	Function effectively as an individual in multi-disciplinary settings.
C218.2	Able to comprehend and write effective reports.
C218.3	Write different types of essays by understanding the elements and structure of a good essay.
C218.4	Write winning job application and project report, statement of purpose and apply these in their career.
C218.5	Read and evaluate texts critically and display critical thinking in various professional contexts.



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363, Arcot Road, Kodambakkam, Chennai – 24
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Website : www.msec.edu.in
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MA8551 - Algebra and Number Theory – [C301]

C301.1	Apply the basic notations of groups, rings, field which will be used to solve the related problems.
C301.2	Understand the fundamental concepts of advanced algebra in modern mathematics.
C301.3	Apply the basic knowledge of advanced algebraic techniques in number theory
C301.4	Apply to solve the non-trivial problems related to the concepts and by proving the simple theorem.
C301.5	Apply integrated approach to number theory and abstract algebra.

CS8591 - Computer Networks – [C302]

C302.1	Understand the basic layers and its functions in computer networks and evaluate the performance of the network
C302.2	Understand the basics of how data flows from one node to another
C302.3	Analyze and design routing algorithms.
C302.4	Design protocols for various functions in the network.
C302.5	Understand the working of various application layer protocols

EC8691 - Microprocessors and Microcontrollers – [C303]

C303.1	Understand architecture of 8086 and Design and implement programs on 8086 microprocessor.
C303.2	Understand signals, system bus architecture of 8086 and multiprocessor configuration.
C303.3	Design and implement interfacing of I/O circuits with 8086 microprocessor
C303.4	Understand architecture of 8051 microcontroller.
C303.5	Understand architecture of 8051, Design and implement programs on 8051 microcontroller.


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Website : www.msec.edu.in
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CS8501 - Theory of Computation – [C304]

C304.1	Construct automata, regular expression for any pattern.
C304.2	Write Context free grammar for any construct.
C304.3	Design Turing machines for any language.
C304.4	Propose computation solutions using Turing machines.
C304.5	Derive whether a problem is decidable or not.

CS8592 - Object Oriented Analysis and Design – [C305]

C305.1	Understand the fundamentals of object modelling and unified process.
C305.2	Design software systems with static UML diagrams.
C305.3	Design software systems using UML dynamic and implementation diagrams.
C305.4	Transform UML based software design into pattern based design using design patterns
C305.5	Understand the various testing methodologies for OO software.

OCE551 - Air Pollution and Control Engineering – [C306]

C306.1	Identify the sources of air pollution with its effects and ambient air quality standards & emission.
C306.2	Understanding the concept of lapse rates, Atmospheric stability, Plume rise and various other parameters on meteorology.
C306.3	Understanding the role of Gravity separators, Centrifugal separator, Fabric filters and ESP.
C306.4	Understanding the role of adsorption, absorption, condensation and incineration techniques.
C306.5	Ability to ensure quality control and preventive measures.

OCE552 - Geographic Information System – [C306]

C306.1	Have basic idea about the fundamentals of GIS.
C306.2	Understand the types of data models.
C306.3	Get knowledge about data input and topology.
C306.4	Gain knowledge on data quality and standards.
C306.5	Understand data management functions and data output


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363, Arcot Road, Kodambakkam, Chennai – 24
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Website : www.msec.edu.in
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EC8681 - Microprocessor and Microcontroller Lab – [C307]

C307.1	Write ALP for arithmetic and logical operations.
C307.2	Interface different I/O's with processor.
C307.3	Generate waveforms using Microprocessors.
C307.4	Execute programs in 8051.
C307.5	Familiar with 8086 and 8051 Simulators.

CS8582 - Object Oriented Analysis and Design Lab – [C308]

C308.1	Perform OO analysis and design for a given problem specification.
C308.2	Identify and map basic software requirements in UML mapping.
C308.3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns.
C308.4	Test the compliance of the software with the SRS.

CS8581 - Networks Lab – [C309]

C309.1	Implement various protocols using TCP and UDP.
C309.2	Compare the performance of different transport layer protocols.
C309.3	Use simulation tools to analyze the performance of various network protocols.
C309.4	Analyze various routing algorithms.
C309.5	Implement error correction codes.

CS8651 - Internet Programming – [C310]

C310.1	Construct a basic website using HTML and Cascading Style Sheets.
C310.2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
C310.3	Develop server side programs using Servlets and JSP.
C310.4	Construct simple web pages in PHP and to represent data in XML format.
C310.5	Use AJAX and web services to develop interactive web applications.


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363, Arcot Road, Kodambakkam, Chennai – 24
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Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CS8691 - Artificial Intelligence – [C311]

C311.1	Use appropriate search algorithms for any AI problem.
C311.2	Represent a problem using first order and predicate logic.
C311.3	Provide the apt agent strategy to solve a given problem.
C311.4	Design software agents to solve a problem.
C311.5	Design applications for NLP that use Artificial Intelligence.

CS8601 - Mobile Computing – [C312]

C312.1	To understand the basic concepts of mobile computing.
C312.2	To learn the basics of mobile telecommunication system.
C312.3	To be familiar with the network layer protocols and Ad-Hoc networks.
C312.4	To know the basis of transport and application layer protocols.
C312.5	To gain knowledge about different mobile platforms and application development.

CS8602 - Compiler Design – [C313]

C313.1	Design lexical analyzer for a sample language.
C313.2	Apply different parsing algorithms to develop the parsers for a given grammar.
C313.3	Understand syntax-directed translation and generate intermediate code.
C313.4	Understand run-time environment and design simple code generator.
C313.5	Apply code optimization techniques.

CS8603 - Distributed System – [C314]

C314.1	Elucidate the foundations and issues of distributed systems.
C314.2	Understand the various synchronization issues and global state for distributed systems.
C314.3	Understand the Mutual Exclusion and Deadlock Detection algorithms in distributed systems.
C314.4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
C314.5	Describe the features of peer-to-peer and distributed shared memory systems.


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Approved by AICTE & Affiliated to Anna University
Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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IT8076 - Software Testing – [C315]

C315.1	Outline the software testing criteria for developing test cases.
C315.2	Build the test cases for software development.
C315.3	Understand the various level of testing.
C315.4	Discuss about the test metrics, measurements and management process.
C315.5	Illustrate the needs of software test automation and make use of the latest test tool for Testing.

CS8661 - Internet Programming Laboratory – [C316]

C316.1	Construct Web pages using HTML/XML and style sheets.
C316.2	Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
C316.3	Develop dynamic web pages using server side scripting.
C316.4	Use PHP programming to develop web applications.
C316.5	Construct web applications using AJAX and web services.

CS8662 - Mobile Application Development Laboratory – [C317]

C317.1	To understand the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
C317.2	To understand how to work with various mobile application development frameworks
C317.3	To learn the basic and important design concepts and issues of development of mobile applications.
C317.4	To understand the capabilities and limitations of mobile devices.
C317.5	To understand the components and structure of mobile application development frameworks for Android and windows OS based mobiles

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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024

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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
Email Id: principal@msec.edu.in
Website : www.msec.edu.in
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS8611 - Mini Project – [C318]

C318.1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology <ul style="list-style-type: none">· Review the literature and develop solutions for framed problem statement.· Implement hardware and/or software techniques for identified problems.· Test and analyses the modules of planned project.· Write technical report and deliver presentation.· Apply engineering and management principles to achieve project goal.
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HS8581 – Professional Communication – [C319]

C319.1	To enhance the students to make effective presentations.
C319.2	To help the students participate confidently in Group Discussions.
C319.3	To motivate and prepare the students to attend job interviews and be successful in their pursuit.
C319.4	To train and develop the adequate Soft Skills required for the workplace.
C319.5	Ability to interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.

MG8591 - Principles of Management – [C401]

C401.1	Define management and its evolution.
C401.2	Summarize the functions of planning.
C401.3	Summarize the functions of organising.
C401.4	Classify the various directing techniques.
C401.5	Identify the various control techniques.

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363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CS8792 - Cryptography and Network Security – [C402]

C402.1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
C402.2	Apply the different cryptographic operations of symmetric cryptographic algorithms
C402.3	Apply the different cryptographic operations of public key cryptography
C402.4	Apply the various Authentication schemes to simulate different applications.
C402.5	Understand various Security practices and System security standards

CS8791 - Cloud Computing [C403]

C403.1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing
C403.2	Learn the key and enabling technologies that help in the development of cloud
C403.3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
C403.4	Explain the core issues of cloud computing such as resource management and security. .
C403.5	Be able to install and use current cloud technologies.

OCY751 - Waste Water Treatment – [C404]

C404.1	Understand the physical, chemical and biological parameters of water and water quality requirement. Gain the knowledge about preliminary treatment
C404.2	Gain the knowledge about filtration , lime soda, zeolite and demineralization processes and – industrial water treatment for boilers.
C404.3	Understand the conventional treatment methods like adsorption , activated carbon treatment , iron and manganese removal , aeration, oxidation, ion exchange.
C404.4	Gain the knowledge on wastewater treatment pre and primary treatment, equalization neutralization – screening and grid removal – sedimentation – oil separation gas stripping of volatile organics
C404.5	Will have knowledge about adsorption and oxidation process



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363, ARCOT ROAD, KODAMBAKKAM,
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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
Email Id: principal@msec.edu.in
Website : www.msec.edu.in
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GE8077 - Total Quality Management – [C405]

C405.1	To select and apply appropriate techniques in identifying customer needs, as well as the quality impact that will be used as inputs in TQM methodologies
C405.2	Have a strategy to create and maintain a quality culture that will move the organization towards world-class status
C405.3	Understand the TQM concept and techniques for managing, controlling and improving quality at the workplace
C405.4	Knowing business excellence models and be able to assess organizations performance through data collection and analysis
C405.5	Have a strategy to implement total quality practices at the workplace and effect savings on the input cost of an organization

GE 8071 - Disaster Management – [C406]

C406.1	Understand and Differentiate the types of disasters, causes and their impact on environment and society.
C406.2	Analyse various methods of risk reduction measures as well as mitigation and assess the Vulnerability.
C406.3	Understand and examine the hazard and vulnerability profile of India.
C406.4	Value the Disaster damage assessment and recognize how to manage the Disaster.
C406.5	Construct ideas for the various disaster Scenarios in the Society.

CS8711 - Cloud Computing Lab [C407]

C407.1	Configure various virtualization tools such as Virtual Box, VMware workstation.
C407.2	Design and deploy a web application in a PaaS environment.
C407.3	Learn how to simulate a cloud environment to implement new schedulers.
C407.4	Install and use a generic cloud environment that can be used as a private cloud.
C407.5	Manipulate large data sets in a parallel environment.

IT8761 - Security Laboratory – [C408]

C408.1	Develop code for classical Encryption Techniques to solve the problems.
C408.2	Build cryptosystems by applying symmetric and public key encryption algorithms
C408.3	Construct code for authentication algorithms
C408.4	Develop a signature scheme using Digital signature standard
C408.5	Demonstrate the network security system using open source tools


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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
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GE8076 - Professional Ethics in Engineering [C409]

C409.1	The students be aware on human values for professional excellence and stress management.
C409.2	The students gain knowledge on engineering ethics, moral issues & uses of ethical theories.
C409.3	The students understand the role of engineers as responsible experimenters along with courses of ethics in engineering field .
C409.4	The students will be aware of responsibilities of an engineer for safety and risks along with risk benefit analysis.
C409.5	The students will acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives.

CS8078 - Green Computing – [C410]

C410.1	To understand the concepts of technologies that conform to low-power computation.
C410.2	To understand green (power-efficient) technologies for components of one single computer, such as CPU, memory and disk, and appreciate cutting edge designs for these components.
C410.3	To have a basic understanding of a variety of technologies applied in building a green system and to identify the various key sustainability and green IT trends.
C410.4	To discuss the various laws, standards and protocols for regulating green IT.
C410.5	Be able to use a range of tools to help monitor and design green systems.

CS8811 - Project Work - [C411]

C411.1	<p>On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.</p> <ul style="list-style-type: none">• Review the literature and develop solutions for framed problem statement.• Implement hardware and/or software techniques for identified problems.• Test and analyse the modules of planned project.• Write technical report and deliver presentation.• Apply engineering and management principles to achieve project goal.
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CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University

email Id: principal@msec.edu.in

Website : www.msec.edu.in

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATION – 2017 COURSE OUTCOMES

MA8352 - Linear Algebra and Partial Differential Equations [C201]

C201.1	Interpret the basic notions of groups, rings, fields and Vector Space which will then be used to solve related problems
C201.2	Identify the concepts of vector space, linear transformations and diagonalization..
C201.3	Classify and apply the concept of inner product spaces in orthogonalization processes
C201.4	Evaluate the procedure to solve partial differential equations
C201.5	Examine and Able to solve the engineering problems using Fourier series.

EC8393 - Fundamentals of Data Structures in C [C202]

C202.1	Implement Linear and Non-Linear data structure operations using C
C202.2	Suggest appropriate linear/non-linear data structure for any given data set
C202.3	Apply hashing concepts for a given problem
C202.4	Modify or suggest new data structure for an application
C202.5	Appropriately choose the sorting algorithm for an application

EC8351 - Electronic Circuits – I [C203]

C203.1	Understand the basic concept of biasing and design biasing for various types of amplifiers
C203.2	Design and analyse single stage and multistage BJT amplifiers
C203.3	Design and analyse single stage and multistage FET amplifiers
C203.4	Analyse the frequency response of BJT and MOSFET amplifiers
C203.5	Design, troubleshoot and fault analysis the regulated DC power supplies

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CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 24
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EC8352 - Signals and Systems [C204]

C204.1	Analyze & classify Continuous and Discrete time signals and to identify LTI systems
C204.2	Derive the Fourier series for continuous time signals and analyze the Fourier transform and Laplace transform of different signals
C204.3	Analyze the output response of the Continuous Time systems by performing convolution and realize the continuous Time Systems
C204.4	Analyze the Discrete Time Fourier Transform and Z transform of Discrete Time signals & Understand the sampling theorem and to convert the analog signal to discrete signal
C204.5	Analyze the output response of the Discrete Time systems by performing convolution and realize the Discrete Time Systems

EC8392 - Digital Electronics [C205]

C205.1	Simplify Boolean functions using Kmap and quine Mclasky
C205.2	Design and analyze combinational circuits
C205.3	Design and analyze Synchronous sequential circuits
C205.4	Design and Analyze Asynchronous Sequential Circuits
C205.5	Implement designs using programmable logic devices and digital integrated circuits

EC8391 - Control Systems Engineering [C206]

C206.1	Understand the methods of representation of systems and getting their transfer function models for analysis of physical systems and to introduce the control system components
C206.2	Get adequate knowledge in the time response of systems and steady state error analysis and to introduce the effects of controllers
C206.3	Obtain basic knowledge in obtaining the open loop and closed loop frequency responses of systems and to study the design of compensators
C206.4	Understand the concept of stability of control system and methods of stability analysis
C206.5	Understand the state space model of a physical system and the concepts of sampled data control system.


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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

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EC8381 - Fundamentals of Data Structures in C Laboratory [C207]

C207.1	Write basic and advanced programs in C
C207.2	Implement functions and recursive functions in C
C207.3	Implement data structures using C
C207.4	Choose appropriate sorting algorithm for an application and implement it in a modularized way

EC8361 - Analog and Digital Circuits Laboratory [C208]

C208.1	Design regulated power supplies
C208.2	Design regulated power supplies
C208.3	Simulate amplifier using SPICE
C208.4	Design and implement combinational circuits.
C208.5	Design and implement sequential circuits.

HS8381 - Interpersonal Skills/Listening&Speaking [C209]

C209.1	Ability to listen and respond appropriately
C209.2	Ability to participate in group discussions.
C209.3	Ability to make effective presentation.
C209.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to speak clearly in simple language.
C209.5	Ability to participate confidently and appropriately in formal and informal conversations.


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CHENNAI-600 024



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Website : www.msec.edu.in

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MA8451 - Probability and Random Processes [C210]

C210.1	Interpret the axiomatic formulation of Probability theory and random variables as an intrinsic need for the analysis of random phenomena
C210.2	Identify probability models, function of random variables based on one & two dimensional random variables and determine regression.
C210.3	Classify the concept of random processes and to demonstrate the specific applications to Poisson and Markov Processes.
C210.4	Evaluate correlation and spectral density of stationary random processes.
C210.5	Examine the idea of linear time invariant system.

EC8452 - Electronic Circuits II [C211]

C211.1	To understand the concepts and design of feedback amplifiers.
C211.2	To understand the basic concepts, design and analyze RC, LC and crystal oscillators.
C211.3	To understand the performance of tuned amplifiers.
C211.4	To understand the concepts of clipper, clamper, comparator circuits and multivibrators.
C211.5	To understand the concepts power amplifiers and DC convertors.

EC8491 - Communication Theory [C212]

C212.1	Design AM communication systems
C212.2	Design Angle modulated communication systems
C212.3	Apply the concepts of Random Process to the design of Communication systems
C212.4	Analyze the noise performance of AM and FM systems
C212.5	Gain Knowledge in sampling and quantization


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EC8451 - Electromagnetic Fields [C213]

C213.1	Able to understand the concepts of vector calculus and vector coordinate systems
C213.2	Able to understand the behaviour of static electric field and the concept of conductors and dielectrics in static electric fields.
C213.3	Able to understand the behaviour of magnetic circuits and magnetic material
C213.4	To analyse Maxwell's equation in differential and integral form
C213.5	Able to analyse the propagation of EM waves in lossy and lossless media.

EC8453 - Linear Integrated Circuits [C214]

C214.1	To understand the basic building blocks of linear integrated circuits
C214.2	To understand the linear and non-linear applications of operational amplifiers
C214.3	To understand the concepts and applications of analog multipliers and PLL
C214.4	To understand the concepts of ADC and DAC using Op-Amps
C214.5	To understand the concepts of waveform generation and introduce some special function ICs

GE8291 - Environmental Science and Engineering [C215]

C215.1	The knowledge gained on flora and fauna in our environment helps to know about social environment.
C215.2	The students will gain knowledge on the offensive effects of pollution in the day-to-day life.
C215.3	The students will acquire knowledge on the natural resources available and their conservation.
C215.4	The students will have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming.
C215.5	The students will get knowledge about the problems faced by the society due to population explosion.


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EC8461 - Circuits Design and Simulation Laboratory [C216]

C216.1	Analyze various types of feedback amplifiers
C216.2	Design oscillators and tuned amplifiers.
C216.3	Demonstrate the various types of multivibrators.
C216.4	Simulate Oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool.
C216.5	Analyze various types of power amplifiers.

EC8462 - Linear Integrated Circuits Lab [C217]

C217.1	To understand the basics of linear integrated circuits and available ICs
C217.2	To understand the characteristics of the operational amplifier
C217.3	To apply operational amplifiers in linear and nonlinear applications
C217.4	To acquire the basic knowledge of special function IC.
C217.5	To use SPICE software for circuit design

EC8501 - Digital Communication [C301]

C301.1	To Design PCM systems
C301.2	To Design and implement base band transmission schemes
C301.3	To Design and implement band pass signalling schemes
C301.4	To Analyze the spectral characteristics of band pass signalling schemes and their noise performance
C301.5	To Design error control coding schemes


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EC8553 - Discrete Time Signal Processing [C302]

C302.1	Apply DFT for the analysis of digital signals and systems
C302.2	Design IIR filters
C302.3	Design FIR filters and Characterize finite word length effects on filters
C302.4	Analyse Finite word length effect
C302.5	Study the architecture, addressing modes and programming of DSP processor

EC8552 - Computer Architecture and Organization [C303]

C303.1	Describe Data representation, instruction formats and the operation of a digital computer
C303.2	Illustrate the fixed point and floating-point arithmetic for ALU operation
C303.3	Discuss about implementation schemes of control unit and pipeline performance.
C303.4	Explain the concept of various memories, interfacing and organization of multiple processors
C303.5	Discuss parallel processing technique and unconventional architectures.

EC8551 - Communication Networks [C304]

C304.1	Able to explain the components requirement of networks and link layer service.
C304.2	Able to classify the Media Access Control Protocols and different Internetworking.
C304.3	Able to Demonstrate various types of routing techniques.
C304.4	Able to outline the mechanisms involved in transport layer.
C304.5	Able to experiment with different application layer protocols.


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EC8073 – Medical Electronics [C305 A]

C305.1	Discuss the terminologies of electro-physiological and recording of bio-potential.
C305.2	Comprehend the measurement techniques of bio-chemical and non-electrical parameters.
C305.3	Interpret the various types of assist devices.
C305.4	Comprehend the various diathermy and bio-telemetry techniques.
C305.5	Outline current trends in medical instrumentation.

EC8074 – Robotics & Automation [C305 B]

C305.1	Identify components, advantages, disadvantages, applications of robots and review the history of robotic evolution.
C305.2	Understand actuators and sensors for measurement of parameters used in robot manipulator.
C305.3	Solve direct and inverse kinematics of simple robot manipulators.
C305.4	Develop mathematical equations related to robot kinematics, dynamics and path planning.
C305.5	Understand the impact and progress in AI and other research trends in the field of robotics

OIT552 – Cloud Computing [C306 A]

C306.1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing
C306.2	Learn the key and enabling technologies that help in the development of cloud
C306.3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
C306.4	Explain the core issues of cloud computing such as resource management and security
C306.5	Be able to install and use current cloud technologies and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud

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EC8562 - Digital Signal Processing Laboratory [C307]

C307.1	To implement Linear and Circular Convolution
C307.2	To implement FFT and IFFT algorithms
C307.3	To implement FIR and IIR filters
C307.4	To study the architecture of DSP processor
C307.5	To demonstrate Finite word length effect effect

EC8561 - Communication Systems Laboratory [C308]

C308.1	Simulate and validate the various functional modules of a communication system
C308.2	Demonstrate their knowledge in baseband signaling schemes through implementation of digital modulation schemes
C308.3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
C308.4	Simulate end to end communication link

EC8563 - Communication Networks Laboratory [C309]

C309.1	Communicate between two desktop computers
C309.2	Implement the different flow control protocols
C309.3	Write program using sockets
C309.4	Implement and compare various routing algorithms
C309.5	Use the network simulation tool


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EC8691 - Microprocessors and Microcontrollers [C310]

C310.1	Understand architecture of 8086 and Design and implement programs on 8086 microprocessor.
C310.2	Understand signals, system bus architecture of 8086 and multiprocessor configuration.
C310.3	Design and implement interfacing of I/O circuits with 8086 microprocessor
C310.4	Understand architecture of 8051 microcontroller.
C310.5	Understand architecture of 8051 , Design and implement programs on 8051 microcontroller.

EC8095 - VLSI Design [C311]

C311.1	Realize the concepts of digital building blocks using MOS transistor.
C311.2	Design combinational MOS circuits and power strategies.
C311.3	Design and construct Sequential Circuits and Timing systems.
C311.4	Design arithmetic building blocks and memory subsystems.
C311.5	Apply and implement FPGA design flow and testing.

EC8652 - Wireless Communication [C312]

C312.1	Able to Characterize a wireless channel and evolve the system design specifications
C312.2	Able to Design a cellular system based on resource availability and traffic demands.
C312.3	Able to Identify suitable signalling and multipath mitigation techniques for the wireless channel and system under consideration
C312.4	Able to understand the concepts of diversity in channels.
C312.5	Able to understand the concepts of fading and non- fading channels


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MG8591 - Principles of Management [C313]

C313.1	Understand the managerial functions like planning, organizing, staffing, leading & controlling
C313.2	The basic knowledge on international aspect of management
C313.3	The basic knowledge on management and its evolution
C313.4	A knowledge on budgetary control and their strategies
C313.5	A understanding of the motivational theories existing in the management

EC8651 - Transmission Lines and RF Systems [C314]

C314.1	Discuss the signal propagation through transmission lines.
C314.2	Discuss the difference between low frequency transmission and propagation at Radio Frequencies.
C314.3	Analyse impedance matching techniques using stubs.
C314.4	Analyse the various modes of propagation of wave guides and cavity resonators.
C314.5	Analyse the various functions of different RF systems and stability considerations of RF systems.

EC8004 – Wireless Networks [C315]

C315.1	Able to understand the architecture, protocol stack and services offered by Wireless Local Area Networks.
C315.2	Able to understand the basics of mobile IP networks, mechanism behind packet delivery and various routing protocols of MANETs.
C315.3	Able to understand the architecture of UMTS, protocol layers and various services offered by 3G networks.
C315.4	Able to understand the internetworking architecture of WLANS & WWANS.
C315.5	Able to understand the motivation behind 4G evolution and various technologies developed for 4G networks.


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EC8681 – Microprocessors and Microcontrollers Laboratory [C316]

C316.1	Write ALP for arithmetic and logical operations
C316.2	Interface different I/O's with processor
C316.3	Generate waveforms using Microprocessors
C316.4	Execute programs in 8051
C316.5	Familiar with 8086 and 8051 Simulators.

EC8661 – VLSI Design Laboratory [C317]

C317.1	Write HDL code for basic as well as advanced digital integrated circuit
C317.2	Import the logic modules into FPGA Boards
C317.3	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools

EC8611 – Technical Seminar [C318]

C318.1	Identify the domain specific engineering problem for presentation.
C318.2	Prepare the document with proper work plan.
C318.3	Compare and analyze the emerging technology.
C318.4	Show the presentation skill in front of the audience.
C318.5	Discuss with the peer members.

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HS8581 – Professional Communication [C319]

C319.1	Enhance the students to make effective presentations.
C319.2	Help the students participate confidently in Group Discussions.
C319.3	Motivate and prepare the students to attend job interviews and be successful in their pursuit.
C319.4	Train and develop the adequate Soft Skills required for the workplace.
C319.5	Interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.

EC8701 – Antennas & Microwave Engineering [C401]

C401.1	Apply the basic principles and evaluate antenna parameters and link power budgets
C401.2	Design and assess the performance of various antennas
C401.3	Analyse Antenna Array and its different mode of operation
C401.4	Analyse various operation of microwave passive devices and microwave generators
C401.5	Design a microwave system given the application specifications

EC8751 – Optical Communication [C402]

C402.1	Realize basic elements in optical fibers, different modes and configurations.
C402.2	Analyze the transmission characteristics associated with dispersion and polarization techniques
C402.3	Design optical sources and detectors with their use in optical communication system.
C402.4	Construct fiber optic receiver systems, measurements and coupling techniques.
C402.5	Design optical communication systems and its networks.



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EC8791 – Embedded and Real Time Systems [C403]

C403.1	Interpret the concepts of embedded system design and analysis.
C403.2	Describe the architecture and programming of ARM Processor.
C403.3	Analyze the performance and optimization techniques of embedded programming components.
C403.4	Explain the basic concepts of Real Time System for Embedded system design
C403.5	Evaluate the Real time operating system performance and power optimization strategies for embedded system process.

EC8702 – Ad hoc and Wireless Sensor Networks [C404]

C404.1	Explain the various protocols of Adhoc networks
C404.2	Describe the Architecture of Wireless Sensor Network.
C404.3	Describe the Wireless Sensor Network concepts and protocol.
C404.4	Discuss about the Network Security in Sensor based network.
C404.5	Discuss about the Wireless Sensor Network software tools.

GE8071 – Disaster Management

C405.1	Differentiate the types of disasters, causes and their impact on environment and society
C405.2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
C405.3	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
C405.4	Gain knowledge on Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster
C405.5	Gain knowledge on Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

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OME754 – Industrial Safety [C406A]

C406A.1	Identify the various possible hazards in different fields of engineering
C406A.2	Classify various hazards based on their nature and severity
C406A.3	Apply the principles for maintaining safety, occupational health and hygiene in an industry
C406A.4	Examine the factors that lead to an accident
C406A.5	Plan the safety measures appropriate for an industry.

OCS751 – Data Structures & Algorithms [C406A]

C406B.1	Understand the various algorithm design and analysis techniques and Implement various linear data structures operations and applications using List ADT.
C406B.2	Implement and apply the linear data structures stack and queue to problem solutions.
C406B.3	Illustrate and compare various techniques for searching and sorting.
C406B.4	Represent and manipulate data using nonlinear data structure tree to design algorithms for various applications.
C406B.5	Implement and apply the nonlinear data structure Graph ADT to problem solutions using dynamic programming and greedy approach.

OCS752 – Introduction to C Programming [C406B]

C406C.1	Develop executable C programs with decision making and looping statements, which illustrate the use of various operators.
C406C.2	Write executable C programs which process the data that are stored in an array.
C406C.3	Create executable C programs to process strings and use pointers for array processing and parameter passing
C406C.4	Divide a given computational problem into a number of modules called functions and develop multi-function C program by using recursion if required, to solve the computational problem.
C406C.5	Develop executable C programs with structure for storing the data to be processed

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EC8711 – Embedded Laboratory [C407]

C407.1	Understand the Building Blocks of ARM CORTEX M4 Embedded Kit.
C407.2	Write programs in ARM for a specific Application
C407.3	Interface A/D and D/A convertors with ARM system
C407.4	Write program for interfacing motor and sensor.
C407.5	Write program for interfacing keypad and LCD.

EC8761 - Advanced Communication Laboratory [C408]

C408.1	Analyze the performance of simple optical link by measurement of losses and analyzing the mode characteristics of fiber
C408.2	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
C408.3	Estimate the Wireless Channel Characteristics and analyze the performance of Wireless
C408.4	Understand the characteristics of Microwave Sources
C408.5	Understand the Characteristics in Microwave System design

GE8076 - Professional Ethics in Engineering [C409]

C409.1	Gain awareness on human values for professional excellence and stress management
C409.2	Gain knowledge on engineering ethics, moral issues & uses of ethical theories
C409.3	Understand the role of engineers as responsible experimenters along with courses of ethics in engineering field .
C409.4	Gain awareness of responsibilities of an engineer for safety and risk along with risk benefit analysis
C409.5	Acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives

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EC8094 – Satellite Communication [C410A]

C410A.1	Analyze the satellite orbit
C410A.2	Analyze the earth segment and space segment
C410A.3	Analyze the various methods of satellite access
C410A.4	Analyze the satellite Link design
C410A.5	Design various satellite applications

IT8006- Principles of Speech Processing [C410]

C410.1	Understand the Fundamentals of speech production
C410.2	To understand the speech compression techniques
C410.3	To understand the speech recognition techniques
C410.4	Deal with the issues in speech recognition
C410.5	Explain the concept of Text-to-Speech Synthesis

EC8811- Project Work [C411]

C411.1	Apply the fundamental knowledge and skills in engineering and effectively formulate a project.
C411.2	Plan and manage the time effectively as a team.
C411.3	Orally present and demonstrate the product to peers, academics, general and industry community.
C411.4	Consider the business context and commercial positioning of designed devices or systems
C411.5	Explore the knowledge for the 'real world' situations that a professional engineer can encounter



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COURSE OUTCOMES:2017 REGULATION

MA8353 -Transforms and Partial Differential Equations

C201.1	To Formulate and solve partial differential equations.
C201.2	To Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

EE8351 Digital Logic Circuits

C202.1	To study various number systems and simplify the logical expressions using Boolean functions
C202.2	To study combinational circuits
C202.3	To design various synchronous and asynchronous circuits
C202.4	To introduce asynchronous sequential circuits and PLDs
C202.5	To introduce digital simulation for development of application oriented logic circuits


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EE8391 Electromagnetic Theory

C203.1	Explain the different coordinate systems, and apply Gauss's law
C203.2	Interpret the concepts of Electrostatic fields and apply boundary conditions on electrostatic fields
C203.3	Develop concepts of Magnetostatic fields and apply boundary conditions.
C203.4	Analyze the Maxwell's equations for electromagnetic fields
C203.5	Derive Electromagnetic wave equation and apply the Poynting expression.

EE8301 Electrical Machines - I

C204.1	Able to analyze the magnetic circuits & Calculate the induced EMF and understand the properties of magnetic materials.
C204.2	Able to understand the working of Transformer and analyze the operation of transformer indifferent loading condition
C204.3	Able to understand & analyze the concept of field energy and co-energy in single and multiple excited systems
C204.4	Understand the construction of D.C machines and operation of DC Generator
C204.5	Understand the operation of DC motor, Starting and speed control of DC motor, analyzethe characteristics of dc motor & the braking system

EC8353 Electron Devices and Circuits

C205.1	Explain the structure and characteristics of various types of Diodes, design half and full wave Rectifiers.
C205.2	Understand the different configurations of BJT, MOSFET,UJT and draw its characteristics.
C205.3	Analyse the characteristics of amplier gain and frequency response.
C205.4	Analyse the concepts of different modes of differential amplifier,tuned amplifier and poweramplifier
C205.5	Develop the parameters of feedback amplifier circuit, describe different types of oscillator circuits.


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ME8792 Power Plant Engineering

C206.1	Explain the layout, construction and working of the components inside a thermal power plant.
C206.2	Explain the layout , construction and working of the components inside a diesel gas and combined cycle power plants.
C206.3	Explain the layout, construction and working of the components inside nuclear power plant.
C206.4	Explain the layout, construction and working of the components inside renewable energy power plants.
C206.5	Explain the application of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

EC8311 Electronics Laboratory

C207.1	To observe the characteristics of electronic devices such as diodes,transistors etc
C207.2	Measure voltage,frequency and phase of any waveform using CRO. Generate sine, square and triangular waveforms with required frequency and amplitude using function generator
C207.3	To analyse the characterisitics of common emitter amplifier and rc phase shift oscillator

EE8311 Electrical Machines Laboratory - I

C208.1	Ability to understand and analyze DC Generator
C208.2	Ability to understand and analyze DC Motor
C208.3	Ability to understand and analyse Transformers.


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MA8491 Numerical Methods

C209.1	Have clear perception of the power of numerical techniques ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.
C209.2	Gain knowledge of interpolation-forward and backward.
C209.3	Solve problems in differentiation and integration.
C209.4	solve various types of initial value partial differential Equations
C209.5	Solve various types of Seidal method problems.

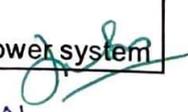
EE8401 Electrical Machines - II

C210.1	Ability to understand the construction, working principle and performance of Synchronous Generator
C210.2	Ability to acquire knowledge on Synchronous Motor
C210.3	Ability to understand the construction and working principle of three phase Induction Motor
C210.4	Ability to acquire knowledge on starting and speed control mechanisms on three phase Induction Motor
C210.5	Ability to understand the construction and working principle of Special Machines

EE8402 Transmission and Distribution

C211.1	To understand the importance and the functioning of transmission line parameters.
C211.2	To acquire knowledge on the modelling and performance of transmission lines.
C211.3	To understand the concept of Lines and Insulators
C211.4	To acquire knowledge on underground cables.
C211.5	To understand the importance of distribution systems of the electric power in power system


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EE8403 Measurements and Instrumentation

C212.1	To impart knowledge on basic functional elements of instrumentation, the factors affecting performance of measuring system and different measuring instruments to measure current and voltage.
C212.2	To understand the operating principles of various types of electrical instruments to measure different electrical quantities.
C212.3	To understand the working principle of various comparative methods in measurement techniques.
C212.4	To understand the working principle of various storage and display devices.
C212.5	To understand the concepts various transducers and the data acquisition systems.

EE8451 Linear Integrated Circuits and Applications

C213.1	Analyze the basic planar processes to fabricate the monolithic IC and Summarize the fabrication of active and passive components of ICs.
C213.2	Design the basic applications of op-amp and also analyze the characteristics of op-amp.
C213.3	Design the signal analysis using op-amp based circuits like filters, comparators, multivibrators, waveform generators, converters and instrumentation amplifier.
C213.4	Analyze the functional blocks and applications of special IC's like 555 Timer, 565-PLL, IC 566- VCO and AD633-Analog multiplier ICs.
C213.5	Analyze the functional blocks and applications of AD623, LM78XX, LM79XX, LM317, 723, SMPS and ICL8038.

IC8451 Control Systems

C214.1	To understand the use of transfer function models for analysis physical systems and introduce the control system components.
C214.2	To provide adequate knowledge in the time response of systems, understanding P,PI& PID controllers and to construct root locus for a system.
C214.3	To accord basic knowledge in obtaining the open loop and closed-loop frequency responses of systems using plotting techniques like bode plot and polar plot.
C214.4	To assess stability of a system using RH and nyquist stability criterion and to design compensators.
C214.5	To deduce state variable representation of physical systems and to inspect controllability and observability.


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EE8411 Electrical Machines Laboratory - II

C215.1	Ability to understand and analyze EMF and MMF methods
C215.2	Ability to understand the importance of Synchronous machines and analyze the characteristics of V and Inverted V curves
C215.3	Ability to understand the importance of Induction Machines and acquire knowledge on separation of losses

EE8461 Linear and Digital Integrated Circuits Laboratory

C216.1	Apply Boolean functions to implement adder, subtractor circuits and convert Excess 3 to BCD, Binary to Gray code and vice versa
C216.2	Test Parity generator and checker and Design encoder decoder circuits ,Demonstrate 4 bit synchronous, asynchronous counter and Shift registers.
C216.3	5 Apply OP-AMP to construct Adder, comparator, differentiator, Integrator and describe VCO, PLL characteristics.

EE8412 Technical Seminar

C217.1	Function effectively as an individual and Make effective presentation on Engineering/ technology
C217.2	Review, prepare and present technological developments in the field of electrical and electronics engineering.
C217.3	Design documentation and write effective reports on seminar topics

EE8501 Power System Analysis

C301.1	Develop the per unit mathematical model of the power system and bus admittance and impedance matrices.
C301.2	To derive the power flow equation and apply numerical methods to solve the power flow problem using Gauss seidal and Newton Raphson method.
C301.3	To model and analyse the power system under symmetrical fault conditions.
C301.4	To model and analyse the power system under various unsymmetrical fault conditions.
C301.5	To model and analyse the transient behaviour of power system when it is subjected to a disturbance.


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EE8551 Microprocessors and Microcontrollers

C302.1	Ability to acquire knowledge in Architecture, Memory organization and Interrupts in 8085.
C302.2	Ability to understand the Instruction set, Data Transfer and Programming in 8085
C302.3	Ability to acquire knowledge in Architecture, Memory organization and Interrupts in 8051
C302.4	Ability to understand the importance of interfacing in 8085 & 8051
C302.5	Ability to write assembly language programmes in 8051 and design 8051 based applications

EE8552 Power Electronics

C303.1	Describe the static characteristics of various power semiconductor devices and acquire knowledge in driver and protection circuits.
C303.2	Compare the operation of various types of controlled rectifiers and implement the converters for real time applications.
C303.3	Realize the basics topologies of DC-DC switching regulators and acquire knowledge in real time applications and simulation skills.
C303.4	Describe the principle of operation of various Inverters and distinguish the different types of PWM techniques in harmonic reduction and understand real time applications.
C303.5	Explain the working principle of various AC- AC converters and control strategies and to choose converters for real time applications.

EE8591 Digital Signal Processing

C304.1	To classify the different types of signals and systems and explain the sampling process of continuous time signal.
C304.2	To apply z-transform and inverse Z transform and analyze discrete time systems.
C304.3	To apply Radix -2 Decimation in Time (DIT) and Decimation in Frequency (DIF)FFT Algorithm to Compute Discrete Fourier Transform
C304.4	To design Infinite Impulse Response (IIR) filters and Finite Impulse Response (FIR) filters.
C304.5	To explain various architectures of Digital signal processors


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CS8392 Object Oriented Programming

C305.1	Outline OOP principles such as objects, classes, encapsulation, inheritance and polymorphism and associate those principles in java language.
C305.2	Design algorithms and develop programs using the concept of Inheritance and Interfaces.
C305.3	Examine the exception handling concepts and develop I/O streams for reading and writing files
C305.4	Develop programs that run in the same instant using multithreading and multitasking concepts and utilize the power of generic programming in java for robust programming.
C305.5	Design and develop applications in java using forms, AWT, and swing.

OAN551 SENSORS & TRANSDUCERS

C306.1	To acquire expertise in various calibration techniques and signal types for sensors
C306.2	To acquire knowledge in motion, proximity and ranging sensors in various applications
C306.3	To acquire knowledge in force, magnetic and heading sensors in various applications
C306.4	To acquire knowledge in optical, pressure, temperature and smart sensors in various applications
C306.5	To acquire knowledge in DAQ systems with different sensors for real time applications

EE8511 Control and Instrumentation Laboratory

C307.1	Analyze the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system using MATLAB
C307.2	Compute the transfer function of a Field controlled DC motor experimentally and analyze the response of Lag, Lead and Lag-Lead Compensators
C307.3	Analyze the transient response of Position Control system experimentally and analyze the Characteristics of Synchro-Transmitter- Receiver and to Use MATLAB for the Simulation of Control Systems.
C307.4	Ability to analyze the basic concepts of bridge networks and to analyze the Dynamics of Sensors/Transducers
C307.5	Measure the Power and Energy experimentally and analyze signal conditioning circuits and to Use MATLAB for Process Simulation


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HS8581 Professional Communication

C308.1	To enhance the students to make effective presentations.
C308.2	To help the students participate confidently in Group Discussions.
C308.3	To motivate and prepare the students to attend job interviews and be successful in their pursuit.
C308.4	To train and develop the adequate Soft Skills required for the workplace.
C308.5	Ability to interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.

CS8383 Object Oriented Programming Laboratory

C309.1	Design C++ programs using functions, classes with objects, member functions and constructors.
C309.2	Develop operator and function overloading and run time polymorphism using C++.
C309.3	Develop file handling techniques in C++ for sequential and random access also use Java code for strings.
C309.4	Construct packages and interfaces in Java.
C309.5	Create threads in Java and handle predefined and user defined exceptions.

EE8601 Solid State Drives

C310.1	Analyze the Classification of the various types of drives and load torque characteristics and Apply the multi quadrant dynamics in hoist load system.
C310.2	Analyze the operation of steady state analysis of single phase and three phase fully controlled converter and Chopper fed separately excited dc motor drives and discuss the various control strategies of converter.
C310.3	Analyze the operation and characteristics of various methods of solid state speed control of induction motor.
C310.4	Analyze the operation of various modes of V/f control of synchronous motor drives and different types of permanent magnet synchronous motor drives.
C310.5	Analyze and design a current and speed controller and develop the transfer function for DC motor, load and converter, closed loop control with current and speed feedback.

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EE8602 Protection and Switchgear

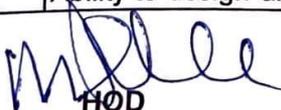
C311.1	Ability to find the causes of abnormal operating conditions of the power system and acquire the knowledge on Methods of Grounding
C311.2	Ability to understand and analyze Electromagnetic relay characteristics
C311.3	Ability to study about the apparatus protection
C311.4	Ability to study about the static and numerical relays
C311.5	Ability to acquire knowledge on functioning of circuit breaker and suggest suitability circuit breaker

EE8691 Embedded Systems

C312.1	Ability to understand and analyze Embedded systems.
C312.2	Ability to suggest an embedded system for a given application.
C312.3	Ability to operate various Embedded Development Strategies
C312.4	Ability to acquire knowledge on various processor scheduling algorithms.
C312.5	Ability to understand basics of Real time operating system.

EE8002 DESIGN OF ELECTRICAL MACHINES

C313.1	Ability to understand basics of design considerations for rotating and static electrical Machines and ability to design of field system and armature for its application.
C313.2	Ability to design single phase and three phase transformer.
C313.3	Ability to design armature and field of DC machines.
C313.4	Ability to design stator and rotor of induction motor.
C313.5	Ability to design and analyze synchronous machines.


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EC8395 COMMUNICATION ENGINEERING

C314.1	Describe the concepts of analog modulation systems
C314.2	Illustrate pulse communication techniques
C314.3	Summarize the concepts of digital modulation systems.
C314.4	Implement the source coding techniques.
C314.5	Explain the basic principles in the generation of spread spectrum signals and multiple access in communication systems

EE8661 Power Electronics and Drives Laboratory

C315.1	Develop schemes for generation of firing pulses suitable for the power switches in converter circuits.
C315.2	Evaluate the performance of powerconverter circuits
C315.3	Experience the platform for simulation of power electronic circuits

EE8681 Microprocessors and Microcontrollers Laboratory

C316.1	Ability to acquire knowledge in Addressing modes & instruction set of 8085 & 8051.
C316.2	Ability to need & use of Interrupt structure 8085 & 8051.
C316.3	Ability to understand the importance of Interfacing

EE8611 Mini Project

C317.1	Apply practical knowledge within the chosen area of expertise for project development
C317.2	Identify, analyze, design and handle prototype projects with a complete and organized approach
C317.3	Contribute as an individual or in a team in development of technical projects
C317.4	Develop effective communication skills for presentation of project related activities and prepare mini project reports and examination

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EE8701 High Voltage Engineering

C401.1	Apply the knowledge of Engineering fundamentals to identify the causes of different over voltages in Electrical Power System and select the protection system according to the types of over voltages.
C401.2	Identify the factors that leads the breakdown mechanism of different dielectric materials and Compare dielectric strength of the different dielectric materials (Gas, Oil, Vacuum and solid)
C401.3	Apply the knowledge of Engineering fundamentals to identify the generating circuits to produce different high voltages and High currents.
C401.4	Apply the knowledge of Engineering fundamentals to identify the measuring instrument to measure the different over voltages and currents in Electrical Power System.
C401.5	Analyse the testing of different Electrical power apparatus and the insulation coordination.

EE8702 Power System Operation and Control

C402.1	Ability to understand the day-to-day operation of electric power system and to analyze the control actions to be implemented on the system to meet the minute-to-minute variation of system demand.
C402.2	Ability to acquire knowledge on real power-frequency interaction and To model power-frequency dynamics and to design power-frequency controller.
C402.3	Ability to understand the reactive power-voltage interaction and To model reactive power-voltage interaction and the control actions to be implemented for maintaining the voltage profile against varying system load.
C402.4	Ability to understand the significance of power system operation and control and To study the economic operation of power system.
C402.5	Ability to understand the various systems available and design SCADA and its application for real time operation.

EE8703 Renewable Energy Systems

C403.1	Analyze the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.
C403.2	Formulate the power in wind energy, classify the types of WPPs, select the site for WPPs and analyze the grid integration issues of WPPs.
C403.3	Apply the knowledge of engineering for harnessing thermal and electrical energy from solar energy
C403.4	Apply the knowledge of engineering for harnessing electrical energy from biomass, geothermal and hydro power energy.
C403.5	Apply the knowledge of engineering for harnessing electrical energy from ocean energy, fuel cell, hybrid energy systems and production with storage of the hydrogen.

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OCS752 Introduction of computer programming

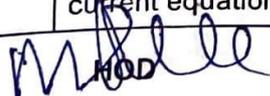
C404.1	Develop executable C programs with decision making and looping statements, which illustrate the use of various operators.
C404.2	Write executable C programs which process the data that are stored in an array.
C404.3	Create executable C programs to process strings and use pointers for array processing and parameter passing
C404.4	Divide a given computational problem into a number of modules called functions and develop multi-function C program by using recursion if required, to solve the computational problem.
C404.5	Develop executable C programs with structure for storing the data to be processed

GE8071 Disaster Management

C405.1	Differentiate the types of disasters, causes and their impact on environment and society
C405.2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
C405.3	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
C405.4	Gain knowledge on Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster
C405.5	Gain knowledge on Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

EE8010 Power Systems Transients

C406.1	Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system.
C406.2	Illustrate the importance of switching transients; Explain the concept of resistance switching, load switching and capacitance switching.
C406.3	Explain the concept of lightning mechanism, Describe the interaction between lightning and power system
C406.4	Apply the concept of reflection and refraction, Draw the Bewley Lattice diagram for different systems.
C406.5	Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system.


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EE8711 Power System Simulation Laboratory

C407.1	Ability to understand power system planning and operational studies.
C407.2	Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks
C407.3	Ability to analyze the power flow using GS and NR method and to find Symmetric and Unsymmetrical fault
C407.4	Ability to understand the economic dispatch and to analyze the electromagnetic transients.

EE8712 Renewable Energy Systems Laboratory

C408.1	Analyze the V-I characteristics and efficiency of 1 KW solar PV system with stand alone and grid connected by conducting experiment and simulation using MATLAB Simulink.
C408.2	Analyze the performance and assessment of micro wind energy generator, solar-wind hybrid system and various types of intelligent controller for hybrid system by conducting experiment and simulation using MATLAB Simulink.
C408.3	Analyze the Hydel power using MATLAB Simulink and analyze the performance and assessment of Fuel cell by conducting experiment and simulation using MATLAB Simulink.

GE8076 Professional Ethics in Engineering

C409.1	Gain awareness on human values for professional excellence and stress management
C409.2	Gain knowledge on engineering ethics, moral issues & uses of ethical theories
C409.3	Understand the role of engineers as responsible experimenters along with courses of ethics in engineering field .
C409.4	Gain awareness of responsibilities of an engineer for safety and risc along with risc benefit analysis
C409.5	Acquire knowledge on global issues and able to apply ethical principles to resolve situations that arise in their professional lives

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EI8073 Biomedical Instrumentation

C410.1	Identify the functions of human nervous system and describe the basic components of biomedical system and give brief idea of different types of transducers.
C410.2	Identify the functions of human nervous system and describe the basic components of biomedical system and give brief idea of different types of transducers.
C410.3	To understand the different types of electrodes and its placement for various recording
C410.4	Explain the basic principles of imaging techniques and patient monitoring system.
C410.5	Describe the functions of life assisting and therapeutic equipments.

EE8811 Project Work

C411.1	Identify and apply the real world and societal importance problems in the Electrical and its allied area.
C411.2	Identify, analyze, design, implement and handle prototype projects with a complete and organized solution methodologies
C411.3	Apply modern engineering tools for solution
C411.4	Contribute as an individual or in a team in development of technical projects
C411.5	Develop effective communication skills for presentation of project related activities and prepare reports and examination following professional ethics


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REGULATION – 2017

COURSE OUTCOMES

MA8351 -Discrete Mathematics [C201]

C201.1	Make use of propositions, predicates and flow of logical proofs.
C201.2	Acquire knowledge on induction and counting principles and to solve recurrence relation.
C201.3	Perceive the knowledge of various types and characteristics of graphs.
C201.4	Interpret concepts and properties of groups, rings and fields.
C201.5	Comprehend the ideas of lattices and Boolean algebra.

CS8351-Digital principles and System design[C202]

C202.1	To understand different methods used for the simplification of Boolean functions
C202.2	To understand and design a system that uses combinational logic for the given specification; Simulate combinational logic systems using verilog or VHDL.
C202.3	To understand and design synchronous sequential system for the given specification; Simulate sequential logic systems using verilog or VHDL.
C202.4	To design and implement Asynchronous sequential system for the given specification.
C202.5	To design and implement memory accessing systems and systems using PLA, PAL.

CS8391-Data structures[C203]

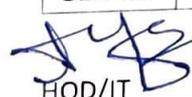
C203.1	Implement abstract data types for linear data structures-List
C203.2	Implement and apply the different linear data structure to problem solutions
C203.3	Implement and apply non-linear data structures tree ADT to problem solutions
C203.4	Implement and apply non-linear data structures Graph ADT to problem solutions
C203.5	Critically analyse the various sorting algorithm.

CS8392-Object oriented programming[C204]

C204.1	Develop Java programs using OOP principles
C204.2	Develop Java programs with the concepts inheritance and interfaces
C204.3	Build Java applications using exceptions and I/O streams
C204.4	Develop Java applications with threads and generics classes
C204.5	Develop interactive Java programs using AWT, Swings components with event handling

EC8394-Analog and Digital Communication[C205]

C205.1	Illustrate analog communication techniques
C205.2	Explain digital communication techniques
C205.3	Illustrate data and pulse communication techniques
C205.4	Make use of various error control coding techniques to identify/correct errors
C205.5	Outline multi-user radio communication


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CS8381-Data Structures Lab[C206]

C206.1	Write functions to implement linear and non-linear data structure operations
C206.2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
C206.3	Appropriately use the linear / non-linear data structure operations for a given problem
C206.4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval

CS8383-Object Oriented Programming Laboratory[C207]

C207.1	Develop and implement Java programs for simple applications that make use of classes
C207.2	Develop and implement Java programs for simple applications that make use of packages and interfaces
C207.3	Develop and implement Java programs with array list, exception handling and multithreading.
C207.4	Design applications using file processing, generic programming
C207.5	Design applications using AWT components and event handling

CS8382-Digital system laboratory[C208]

C208.1	Apply Boolean simplification techniques to construct combinational logic circuits.
C208.2	Build combinational logic circuits to perform arithmetic operations.
C208.3	Implement combinational circuits using MSI devices.
C208.4	Construct Sequential circuits like registers and counters.
C208.5	Simulate combinational and sequential circuits using HDL.

HS8381-Interpersonal skills/listening and speaking[C209]

C209.1	Ability to listen and respond appropriately
C209.2	Ability to participate in group discussions.
C209.3	Ability to make effective presentation.
C209.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to speak clearly in simple language.
C209.5	Ability to participate confidently and appropriately in formal and informal conversations.

MA8391-Probability and Statistics[C210]

C210.1	Interpret the axiomatic formulation of Probability theory and random variables as an intrinsic need for the analysis of random phenomena.
C210.2	Identify probability models, function of random variables based on one & two dimensional random variables and determine regression.
C210.3	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.4	Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.
C210.5	Have the notion of sampling distributions and statistical techniques used in Engineering and management problem

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CS8491-Computer Architecture[C211]

C211.1	Understand the basics structure of computers, operations and instructions
C211.2	Design arithmetic and logic unit
C211.3	Understand pipelined execution and design control unit .
C211.4	Understand Parallel Processing architectures
C211.5	Understand the various Memory systems and I/O communications

CS8492-Database Management Systems[C212]

C212.1	Classify the modern and futuristic database applications based on size and complexity
C212.2	Map ER model to Relational model to perform database design effectively
C212.3	Write queries using normalization criteria and optimize queries
C212.4	Compare and contrast various indexing strategies in different database systems
C212.5	Appraise how advanced databases differ from traditional databases

CS8451-Design and Analysis of Algorithms[C213]

C213.1	Analyse the complexity of algorithms for various computing problems
C213.2	Design and analyse solutions to problems based on brute force, divide and conquer solutions to a problem.
C213.3	Design and analyse solutions to problems based on dynamic programming and greedy approach.
C213.4	Design and analyse solution to problems based on iterative improvement method.
C213.5	To modify existing algorithms to improve efficiency .

CS8493-Operating Systems[C214]

C214.1	Explain the basic concepts ,functions of operating system and system calls
C214.2	Outline various threading models ,process synchronization, Compare the performance of various CPU scheduling algorithm and deadlocks .
C214.3	Compare and contrast various memory management schemes
C214.4	Explain I/O management file systems
C214.5	Perform administrative tasks on Linux servers ,compare ios, Android operating Systems.


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DEPARTMENT OF INFORMATION TECHNOLOGY

GE8291-Environmental Science and Engineering[C215]

C215.1	Gain knowledge on flora and fauna in our environment helps to know about social environment.
C215.2	Gain knowledge on the offensive effects of pollution in the day-to-day life.
C215.3	Acquire knowledge on the natural resources available and their conservation.
C215.4	Have adequate knowledge on the concepts of adverse effects of social issues like acid rain and global warming.
C215..5	Get knowledge about the problems .

CS8481-Database Management Systems Laboratory[C216]

C216.1	Use typical data definitions and manipulation commands
C216.2	Design applications to test Nested and Join Queries
C216.3	Implement simple applications that use Views
C216.4	Implement applications that require a Front-end Tool
C216 .5	Critically analyze the use of tables, view, functions and procedures.

CS8461-Operating Systems Lab[C217]

C217.1	Learn Unix commands and shell programming
C217.2	Implement various CPU Scheduling Algorithms
C217.3	Implement Process Creation and Inter Process Communication.
C217.4	Implement Deadlock Avoidance and Deadlock Detection Algorithms
C217.5	Implement Page Replacement Algorithms and File Organization , File Allocation Strategies

HS8461-Advanced Reading and Writing[C218]

C218.1	Function effectively as an individual in multi-disciplinary settings.
C218.2	Able to comprehend and write effective reports.
C218.3	Write different types of essays by understanding the elements and structure of a good essay.
C218.4	Write winning job application and project report, statement of purpose and apply these in their career
C218.5	Read and evaluate texts critically and display critical thinking in various professional contexts.


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MA8551-Algebra and Number Theory[C301]

C301.1	Apply the basic notations of groups ,rings, field which will be used to solve the related problems.
C301.2	Understand the fundamental concepts of advanced algebra in modern mathematics.
C301.3	Apply the basic knowledge of advanced algebraic techniques in number theory
C301.4	Apply to solve the non-trivial problems related to the concepts and by proving the simple theorem.
C301.5	Apply integrated approach to number theory and abstract algebra.

CS8591- Computer Networks[C302]

C302.1	Understand the basic layers and its functions in computer networks and evaluate the performance of the network
C302.2	Understand the basics of how data flows from one node to another.
C302.3	Analyze and design routing algorithms.
C302.4	Design protocols for various functions in the network.
C302.5	Understand the working of various application layer protocols

EC8691-Microprocessors and Microcontrollers[C303]

C303.1	Understand architecture of 8086 and Design and implement programs on 8086 Microprocessor.
C303.2	Understand signals, system bus architecture of 8086 and multiprocessor Configuration.
C303.3	Design and implement interfacing of I/O circuits with 8086 microprocessor
C303.4	Understand architecture of 8051 microcontroller
C303.5	Understand architecture of 8051 , Design and implement programs on 8051 microcontroller.

IT8501- Web Technology[C304]

C304.1	Design simple web pages using markup languages like HTML and XHTML
C304.2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
C304.3	Program server side web pages that have to process request from client side web pages
C304.4	Represent web data using XML and develop web pages using JSP.
C304.5	Design various web services to the show the interaction.


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CS8494-Software Engineering [C305]

C305.1	Explain the software process and agile development
C305.2	Demonstrate software requirements and Analysis
C305.3	Apply the software design procedure
C305.4	Compare and contrast the various software testing and implementation Techniques
C305.5	Estimate the software project cost and effort

OCE551- Air pollution and control Engineering [C306.OE1]

C306.1	Identify the sources of air pollution with its effects and ambient air quality standards & emission
C306.2	Understanding the concept of lapse rates, Atmospheric stability, Plume rise and various other parameters on meteorology.
C306.3	Understanding the role of Gravity separators, Centrifugal separator, Fabric filters and ESP
C306.4	Understanding the role of adsorption, absorption, condensation and incineration techniques
C306.5	Ability to ensure quality control and preventive measures

OBT553- Fundamentals of Nutrition[C306.OE1]

C306.1	Ability to understand the basics of nutrition and diet plan
C306.2	Understand the process of digestion
C306.3	Understand the concept of carbohydrates and analyse the blood sugar regulation
C306.4	Understand the structure, composition, roles and levels of intake about proteins and lipids.
C306.5	Analyse the metabolism, energy balance and body composition


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EC8681 Microprocessors and Microcontrollers Laboratory[C307]

C307.1	Write ALP for Arithmetic operations and logical operations.
C307.2	Interface different I/Os with processor
C307.3	Generate waveforms using Microprocessors
C307.4	Execute Programs in 8051
C307.5	Familiar with 8086 and 8051 simulators

CS8581- Networks Lab [C308]

C308.1	Implement various protocols using TCP and UDP.
C308.2	Compare the performance of different transport layer protocols.
C308.3	Use simulation tools to analyze the performance of various network protocols.
C308.4	Analyze various routing algorithms.
C308.5	Implement error correction codes.

IT8511-Web Technology Laboratory [C309]

C309.1	Design simple web pages using mark-up languages like HTML.
C309.2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
C309.3	Program server side web pages that have to process request from client side web pages.
C309.4	Represent web data using XML and develop web pages using JSP.

IT8601-Computational Intelligence[C310]

C310.1	Provide a basic exposition to the goals and methods of Computational Intelligence.
C310.2	Study of the design of intelligent computational techniques.
C310.3	Apply the Intelligent techniques for problem solving
C310.4	Improve problem solving skills using the acquired knowledge in the areas of, reasoning
C310.5	Provide Natural language understanding, computer vision, automatic programming and machine learning.


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CS8592-Object Oriented Analysis And Design[C311]

C311.1	Understand the fundamentals of object modelling and unified process.
C311.2	Design software systems with static UML diagrams
C311.3	Design software systems using UML dynamic and implementation diagrams.
C311.4	Transform UML based software design into pattern based design using design patterns
C311.5	Understand the various testing methodologies for OO software.

IT8602- Mobile Communication[C312]

C312.1	Understand the basic concepts of mobile computing
C312.2	Explain the basics of mobile telecommunication systems
C312.3	Illustrate the generations of telecommunication systems in wireless networks
C312.4	Demonstrate the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network
C312.5	Explain the functionality of Transport and Application layers Develop a mobile application using android/blackberry/ios/Windows SDK

CS8091-Big Data Analytics[C313]

C313.1	Work with Big Data Tools and Analysis Techniques
C313.2	Analyze data by utilizing clustering and classification algorithms
C313.3	Learn and apply different mining algorithms and recommendation systems for large volumes of data
C313.4	Perform analytics on data streams
C313.5	Learn NoSQL databases and management.

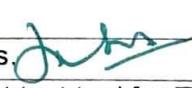
CS8092-Computer Graphics and Multimedia[C314]

C314.1	Explain the basics of illumination models, color models and output primitives.
C314.2	Design two dimensional graphics and apply two dimensional transformations and clipping techniques to graphics.
C314.3	Design three dimensional graphics and apply three dimensional transformations.
C314.4	Inspect the different types of multimedia file formats
C314.5	Design Basic 3d Scenes using Blender

IT8076-Software Testing [C315.PE1]

C315.1	Outline the software testing criteria for developing test cases.
C315.2	Build the test cases for software development.
C315.3	Understand the various level of testing.
C315.4	Discuss about the test metrics, measurements and management process.
C315.5	Illustrate the needs of software test automation and make use of the latest test tool for Testing.


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CS8662-Mobile Application Development Lab[C316]

C316.1	To understand the components and structure of mobile application development frameworks for Android and windows OS based mobiles
C316.2	To understand how to work with various mobile application development frameworks
C316.3	To learn the basic and important design concepts and issues of development of mobile applications.
C317.4	To understand the capabilities and limitations of mobile devices.
C317.5	To understand the components and structure of mobile application development frameworks for Android and windows OS based mobiles

CS8582 Object Oriented Analysis And Design Laboratory[C317]

C317.1	Perform OO analysis and design for a given problem specification
C317.2	Identify and map basic software requirements in UML mapping.
C317.3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
C317.4	Test the compliance of the software with SRS

IT8611-Mini Project[C318]

C318.1	Map the technical knowledge for solving real world problems.
C318.2	Apply new technologies & design techniques concerned for devising a solution for a given problem statement
C318.3	Apply project management skills (scheduling work, procuring resources and working within the confines of a deadline).
C318.4	Work as an individual or in a team in development of technical projects.
C318.5	Communicate and report effectively project related activities and findings.

HS8581 Professional Communication[C319]

C319.1	To enhance the students to make effective presentations.
C319.2	To help the students participate confidently in Group Discussions.
C319.3	To motivate and prepare the students to attend job interviews and be successful in their pursuit.
C319.4	To train and develop the adequate Soft Skills required for the workplace.
C319.5	Ability to interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.

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MG8591- Principles of Management [C401]

C401.1	Define management and its evolution.
C401.2	Summarize the functions of planning.
C401.3	Summarize the functions of organising.
C401.4	Classify the various directing technique.
C401.5	Identify the various control technique.

CS8792- Cryptography and Network Security [C402]

C402.1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities.
C402.2	Apply the different cryptographic operations of symmetric cryptographic algorithms
C402.3	Apply the different cryptographic operations of public key cryptography
C402.4	Apply the various Authentication schemes to simulate different applications.
C402.5	Understand various Security practices and System security standards

CS8791-Cloud Computing[C403]

C403.1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
C403.2	Learn the key and enabling technologies that help in the development of cloud
C403.3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
C403.4	Explain the core issues of cloud computing such as resource management and security. .
C403.5	Be able to install and use current cloud technologies..

OIE751-Robotics[C404.OE2]

C404.1	Summarize the basic concepts of industrial robotics and key components of robotics technologies.
C404.2	Summarize the robot drive systems, grippers and various end effectors
C404.3	Describe the various sensors and image processing & data reduction method for the control of robots
C404.4	Analyse the various kinematics of robots and prepare the robot program.
C404.5	Explain the implementations of robots in industries and analysing robot economics.

CS8081-Internet of Things[C405.PE2]

C405.1	Understand Smart Objects and IoT Architectures
C405.2	Learn about various IOT-related protocols
C405.3	Build simple IoT Systems using Arduino and Raspberry Pi.
C405.4	Understand data analytics and cloud in the context of IoT
C405.5	Develop IoT infrastructure for popular applications


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GE8071-Disaster Management[C406.PE3]

C406.1	Understand and Differentiate the types of disasters, causes and their impact on environment and society.
C406.2	Analyse various methods of risk reduction measures as well as mitigation and assess the Vulnerability
C406.3	Understand and examine the hazard and vulnerability profile of India.
C406.4	Value the Disaster damage assessment and recognize how to manage the Disaster.
C406.5	Construct ideas for the various disaster Scenarios in the Society

IT8711- Foss and Cloud Computing Laboratory[C407]

C407.1	Configure various virtualization tools such as Virtual Box, VMware workstation
C407.2	Design and deploy a web application in a PaaS environment.
C407.3	Learn how to simulate a cloud environment to implement new schedulers.

IT8761-Security Laboratory[C408]

C408.1	Develop code for classical Encryption Techniques to solve the problems..
C408.2	Build cryptosystems by applying symmetric and public key encryption algorithms
C408.3	Construct code for authentication algorithm
C408.4	Develop a signature scheme using Digital signature standard
C408.5	Demonstrate the network security system using open source tools

GE8076- Professional Ethics In Engineering[C409.PE4]

C409.1	Describe the human values with regard to the individual life style for the society
C409.2	Explain the role of ethics to the engineering field
C409.3	Describe how engineering is applied in association with ethics based on engineering experimentation
C409.4	Explain the engineering ethics based safety, responsibilities and rights
C409.5	Discuss the global issues of professional ethics in engineering

IT8078-Web Design and Management[C410.PE5]

C410.1	Design Website using HTML CSS and JS
C410.2	Design Responsive Sites
C410.3	Manage, Maintain and Support Web Apps
C410.4	Learn the web project management and maintenance process
C410.5	To Design a Website with HTML, JS, CSS / CMS – Word press...


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CS8078-Green Computing[C410.PE5]

C410.1	To understand the concepts of technologies that conform to low-power computation.
C410.2	To understand green (power-efficient) technologies for components of one single computer, such as CPU, memory and disk, and appreciate cutting edge designs for these components
C410.3	To have a basic understanding of a variety of technologies applied in building a green system and to identify the various key sustainability and green IT trends.
C410.4	To discuss the various laws, standards and protocols for regulating green IT
C410.5	Be able to use a range of tools to help monitor and design green systems

IT8811-Project Work[C411]

C411.1	Identify the problem by applying acquired knowledge.
C411.2	Analyse and categorize executable project modules after considering risks.
C411.3	Choose efficient tools for designing project modules
C411.4	Combine all the modules through effective team work after efficient testing.
C411.5	Elaborate the completed task and compile the project report.


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**DEPARTMENT OF MECHANICAL ENGINEERING
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**REGULATION – 2017
Course Outcomes**

Course Name : Transforms and Partial Differential Equations (MA8353)

C201.1	Formulate and solve partial differential equations.
C201.2	Evaluate Fourier series of periodic functions.
C201.3	Apply the method of separation of variables to find the solution of heat and wave equation.
C201.4	Illustrate the Fourier transform techniques.
C201.5	Examine Z transform techniques and solve difference equations.

Course Name : Engineering Thermodynamics (ME8391)

C202.1	Understand and apply the concepts of equilibrium, conservation of mass and energy, principles of energy interactions to simple thermal systems.
C202.2	Apply the second law and entropy principles to study simple systems like heat engines, heat pumps and refrigerators etc.
C202.3	Study the phase equilibrium diagrams of various pure substances and analyse vapor power cycles
C202.4	Build thermodynamic relations between various thermodynamic properties to ideal and real gases.
C202.5	Study different psychrometric processes and apply the concepts of psychrometry to solve related problems.

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Course Name : Fluid Mechanics and Machinery(CE8394)

C203.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C203.2	Analyse and calculate major and minor losses associated with pipe flow in piping networks.
C203.3	Understand the practical usefulness of dimensional analysis and apply in framing equations for hydraulic systems.
C203.4	Understand the construction, working principle, performance and design analysis of pumps.
C203.5	Understand the construction, working principle, performance and design analysis of turbines.

Course Name : Manufacturing Technology – I (ME8351)

C204.1	To understand the metal casting processes associated defects, merits and demerits.
C204.2	To impart the knowledge of Different metal joining process.
C204.3	To know the knowledge the various Hot and cold working.
C204.4	To discuss the various sheet metal making processes.
C204.5	To understand the knowledge of various methods of manufacturing plastic components.

Course Name : Electrical Drives and Control (EE8353)

C205.1	Classify types of electric drives systems based on nature of loads, control objectives, performance and reliability.
C205.2	Analyse different motor characteristics.
C205.3	Gain knowledge about DC and AC starters.
C205.4	Apply different speed control methods on DC motors
C205.5	Apply different speed control methods on AC motors

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Course : Manufacturing Technology Laboratory

C206.1	Understand the metal casting processes associated defects, merits and demerits.
C206.2	Understand arc,gas,solid state, resistance welding processes
C206.3	Analyse the process and principles of various metal forming methods
C206.4	Understand the various sheet metal and special forming processes
C206.5	Understand various methods of manufacturing plastic components.

Course : Computer Aided Machine Drawing

C207.1	Follow Indian Standards on drawing practices, symbols, geometric dimensioning and tolerances
C207.2	Visualize and Re-create part drawings, sectional views and assembly drawings of machine components as per standards using CAD software and also by manual drawing
C207.3	Visualize and Re-create assembly drawings of machine components as per standards by manual drawing.

Course : Electrical Engineering Laboratory

C208.1	Student will be able to Understand the characteristics of DC Machines and AC Machines.
C208.2	Student will be able to Understand the different speed control methods of DC and AC machines.
C208.3	Student will be able to analyse the Synchronous motor


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Course : Interpersonal Skills laboratory / Reading & Speaking (HS8381)

C209.1	Ability to listen and respond appropriately.
C209.2	Ability to participate in group discussions.
C209.3	Ability to make effective presentations.
C209.4	Ability to listen/view and comprehend different spoken discourses/excerpts different accents and to speak clearly in simple language.
C209.5	Ability to participate confidently and appropriately in formal and informal conversations.

Course : Statistics and Numerical Methods (MA8452)

C210.1	Compute basic statistical analysis by identifying the tests, computing mean values, standard deviations and confidence intervals.
C210.2	Adapt Design of Experiments using Annova to test the hypothesis.
C210.3	Solve algebraic and transcendental equations and to find dominant Eigen value of a matrix.
C210.4	Estimate the unknown intermediate values through interpolation and calculate the derivatives, the length and area of irregular objects using numerical differentiation and integration.
C210.5	Assess the initial value problems by single and multistep methods numerically.

Course : Kinematics of Machinery (ME8492)

C211.1	Understand various concepts of mechanism and develops mechanism to provide specific motion
C211.2	Analyse the velocity and acceleration of planar mechanisms using graphical method
C211.3	Construct the cam profile for specific follower motion
C211.4	Estimate the size of appropriate gears and gear trains for particular application
C211.5	Apply the concepts of friction to solve problems in machine elements


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Course : Manufacturing Technology – II(ME8451)

C212.1	Introduce the theory of metal cutting and finding out cutting force in turning process
C212.2	Understand the lathe machine and its parts and various operations involved
C212.3	Familiarize with the shaper, milling and gear cutting calculations.
C212.4	Analyses various abrasive processes and operations broaching machines
C212.5	Understand the various turning and machining calculations

Course : Engineering Metallurgy (ME8491)

C213.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
C213.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
C213.3	Clarify the effect of alloying elements on ferrous and non-ferrous metals.
C213.4	Summarize the properties and applications of non-metallic materials.
C213.5	Explain the testing of materials for various mechanical properties.

Course : Strength of Materials for Mechanical Engineers(CE8395)

C214.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C214.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C214.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C214.4	Calculate the slope and deflection in beams using different methods
C214.5	Analyze and design thin and thick shells for the applied internal and external pressures.

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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

Course : Thermal Engineering – I (ME8493)

C215.1	Apply thermodynamic concepts to different air standard cycles, steam power cycles and analyse related problems
C215.2	Explain working principle of various types of air compressors and solve problems
C215.3	Explain the functioning and features of IC engines, its components and combustion in CI and SI engines
C215.4	Calculate performance parameters of IC engines and explain IC engine auxiliaries
C215.5	Describe and analyse open and closed cycle gas turbine plants and their improvement methods

Course : Manufacturing Technology Lab – II(ME8462)

C216.1	Understand the basic milling operations.
C216.2	Understand the principle of various gear cutting operations.
C216.3	Understand the principles of various grinding operations.
C216.4	Understand the basic concepts cutting forces
C216.5	Understand the basic concepts of CNC programming.

Course : Strength of Materials and Fluid Mechanics and Machinery Lab (CE8381)

C217.1	Perform Tension, Torsion, Hardness, Compression, and Deflection test on rods, plates, springs and beams
C217.2	Perform heat treatment operations, measure hardness and study the influence of heat treatment on mechanical properties
C217.3	Perform strain measurement using Rosette strain gauge
C217.4	Experiment with flow measurement devices such as venturimeter, orifice meter and rotometer for actual flow rate and friction losses
C217.5	Carry out performance test on different hydraulic machineries such as pumps and turbines


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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

Course : Advanced Reading and Writing (HS8461)

C218.1	Function effectively as an individual in multi-disciplinary settings.
C218.2	Able to comprehend and write effective reports.
C218.3	Write different types of essays by understanding the elements and structure of a good essay.
C218.4	Write winning job application and project report, statement of purpose and apply these in their career.
C218.5	Read and evaluate texts critically and display critical thinking in various professional contexts.

Course : Thermal Engineering – II (ME8595)

C301.1	Apply thermodynamic concepts to steam nozzles and analyse related problems
C301.2	Explain the functioning and features of different types of boilers ,its auxiliaries and calculate performance parameters
C301.3	Explain flow in steam turbines and draw the velocity diagrams of single and multi-stage turbines
C301.4	Understand the concepts of cogeneration, working features of heat pumps and heat exchangers
C301.5	Apply the basic concepts of thermodynamics to different types of refrigeration and air conditioning systems and analyse related problems

Course : Design of Machine Elements(ME8593)

C302.1	Explain the concepts of principal stresses, theories of failure, stress concentration and fatigue loading
C302.2	Make proper assumptions with respect to material, factor of safety and able to design shafts under fluctuating, combined loads and under critical speed. Design shafts, keys and couplings
C302.3	Analyse the temporary and permanent joints and design joints based on applications.
C302.4	Design different energy storing element (helical springs, compression and tension springs, flywheels) and engine components- (connecting rods and crank shafts)
C302.5	Ability to compute equivalent radial loads for rolling contact bearing and sliding contact bearing and select appropriate bearing from the standard catalogue


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**DEPARTMENT OF MECHANICAL ENGINEERING
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Course : Metrology and Measurements (ME8501)

C303.1	To understand basics of metrology and their effect on precision, accuracy, errors.
C303.2	To learn about linear and angular measuring instruments, principles and applications
C303.3	To understand about advances in metrology like laser interferometers, CMM
C303.4	To learn about form measurement like straightness, flatness, roundness, thread and surface finish
C303.5	To learn about measurements of power, flow and temperature

Course : Dynamics of Machines(ME8594)

C304.1	Analyze forces-motion relationship in standard mechanism and to design a flywheel based on energy fluctuation
C304.2	Analyze balancing problems in rotating and reciprocating machinery and to determine the unbalance forces and couples in a system.
C304.3	Understand the fundamentals of different type of vibratory motion and solve problems related to SDOF free damped and un-damped vibration systems.
C304.4	Analyze the forced vibration of damped SDOF systems and understand the significance of force transmissibility and vibration isolation.
C304.5	Understand the principles in mechanisms used for speed control and stability control and solve problem related to their applications

Course : Open Elective : Environment and Agriculture(OAI551)

C305A.1	To gain knowledge on the issues of with respect to land use and land scape changes. Students able to gain the knowledge about water quality, globalization and agro eco system.
C305A.2	To understand the environmental impacts with respect to erosion and deposition problems in irrigation and mechanized agriculture etc.
C.305A.3	To gain knowledge on the basic concepts of Climate Change, Water scarcity and water shortage.
C305A.4	To understand the ecosystem, ecological diversity, farming principles and forest fragmentation.
C305A.5	To understand the alternate culture systems, Mega farms and vertical farms , Agricultural environment policies and its impacts


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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

Course : Kinematics and Dynamics Laboratory(ME8511)

C306.1	Explain gear parameters, kinematics of mechanisms and determine mass moment of inertia of mechanical element.
C306.2	Demonstrate basic concepts of balancing of forces and couples in rotating and reciprocating mechanical system.
C306.3	Determine vibration response of mechanical elements.
C306.4	Demonstrate working Principles of different types of Governor and Gyroscopic effect on the mechanical system

Course : Thermal Engineering Laboratory (ME8512)

C307.1	Able to draw valve timing of four stroke engines and port timing of two stroke engines and to determine flash and fire power points of fuels
C307.2	Ability to conduct experiments on single cylinder diesel and multi cylinder petrol engines with electrical ,mechanical and hydraulic loading and to study the performance characteristics and draw heat balance
C307.3	Ability to conduct experiments on steam boiler and steam turbine and to study the performance characteristics
C307.4	Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials and natural and forced convection apparatus to evaluate heat transfer coefficient
C307.5	Conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity. Conduct tests to evaluate the performance of parallel / counterflow heat exchanger apparatus
C307.6	Conduct tests of on Air compressors, Heat exchangers, Refrigeration and Air-conditioning test rigs to study and evaluate their performance.

Course : Metrology and Measurements Laboratory (ME8513)

C308.1	Gain knowledge about length and thickness measuring equipments
C308.2	Gain knowledge about angle measuring equipments
C308.3	Get familiar with flatness and straightness equipments.
C308.4	Gain knowledge about screw threads and gear tooth parameters
C308.5	Gain knowledge on force, torque and temperature measuring equipments

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Course : Design of Transmission Systems (ME8651)

C309.1	Design a power transmission system through belt, rope, and chain drive to meet desired needs in engineering applications.
C309.2	Understand Gear Terminology and Design spur and helical gear drive by considering strength and life.
C309.3	Understand the tooth terminology and apply the standard procedure for design of Bevel, Worm and Crossed Helical gears drives.
C309.4	Design of Gear box using standard step ratio, shows its speeds in stages through ray diagram and kinematic arrangement.
C309.5	Analyze and Design the Clutches, Brakes and Cam according to the requirement.

Course : Computer Aided Design and Manufacturing (ME8691)

C310.1	Demonstrate the various stages of design and manufacturing of any product
C310.2	Use modeling features of curves, surfaces and solids in designing simple components
C310.3	Build up the algorithms in making simple curves and for visualization schemes such as viewing, shading and coloring
C310.4	Carry out assembly modeling and execute assembly analysis by understanding concepts such as mating, interferences, tolerance, geometric and mass properties.
C310.5	Use Standards for computer graphics, exchanging data and images and communication between the CAD systems

Course : Heat and Mass Transfer (ME8693)

C311.1	Apply heat conduction equations to different surface configuration under steady state and transient conditions and solve conduction based problems
C311.2	Apply free and forced convection heat transfer correlations to internal and external flow through/over various surface configurations and solve problems.
C311.3	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems,
C311.4	Explain basic laws for radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.
C311.5	Apply diffusive and convective mass transfer equation and correlation to solve problems for different application.


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Course : Finite Element Analysis (ME8692)

C312.1	To understand numerical methods and analytical methods involved in Finite Element method and to understand Ritz technique and weighted residual methods for deriving finite element governing equations.
C312.2	To understand the role and significance of shape functions in finite element formulations and use linear, quadratic, and cubic shape functions for interpolation in global, local, and natural coordinates for the formulation of One-dimensional elements used to solve Structural, thermal and Eigen value problems.
C312.3	To understand the formulation of Two-dimensional elements to solve scalar variable problems.
C312.4	To understand the formulation of Two-dimensional elements to solve vector variable problems.
C312.5	To understand shape function of Isoparametric one-two dimensional, higher order elements (serendipity). Its numerical integration and its application to plane stress problems

Course : Hydraulics and Pneumatics (ME8694)

C313.1	Explain fluid power principles and fundamentals
C313.2	Discuss the hydraulic systems and components
C313.3	Explain the hydraulic circuit
C313.4	Explain the pneumatic circuit
C313.5	Explain design hydraulic and pneumatic circuit

Course : Automobile Engineering (ME8091)

C314A.1	Recognize the various parts of the automobile with their functions and materials.
C314A.2	Discuss the engine auxiliary systems and engine emission control.
C314A.3	distinguish the working of different types of transmission systems
C314A.4	Explain the steering, brakes and suspension systems.
C314A.5	Predict possible alternate source of energy for IC engines.

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Course : Gas Dynamics and Jet Propulsion (ME8096)

C314B.1	Apply the concept of compressible flow in variable area ducts.
C314B.2	Apply the concept of compressible flow in constant area ducts.
C314B.3	Examine the effect of compression and expansion waves in compressible flow.
C314B.4	Use the concept of gas dynamics in Jet Propulsion.
C314B.5	Apply the concept of gas dynamics in Space Propulsion.

Course : CAD / CAM Laboratory (ME8681)

C315.1	To Develop 2D Part AND 3D Part Models using CAD Software
C315.2	To develop 3D Assembly Models using CAD Software
C315.3	To Understand the CNC Control in Modern Manufacturing System
C315.4	To Prepare CNC Part Programming and Perform Manufacturing

Course : Design and Fabrication Project (ME8682)

C316.1	Identify methods and materials to carry out experiments/develop code.
C316.2	Reorganize the procedures with a concern for society, environment and ethics.
C316.3	Design the CAD model and model calculations
C316.4	Explain and Carry out necessary fabrication works as per the design.
C316.5	Prepare a report as per recommended format and defend the work.


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Course : Professional Communication (HS8581)

C317.1	To enhance the students to make effective presentations.
C317.2	To help the students participate confidently in Group Discussions.
C317.3	To motivate and prepare the students to attend job interviews and be successful in their pursuit.
C317.4	To train and develop the adequate Soft Skills required for the workplace.
C317.5	Ability to interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for methods of presentation relevant in different situations.

Course : Power Plant Engineering (ME8792)

C401.1	Explain the layout, construction and working of the components inside a thermal power plant.
C401.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
C401.3	Explain the layout, construction and working of the components inside nuclear power plants.
C401.4	Explain the layout, construction and working of the components inside Renewable energy power plants.
C401.5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

Course : Process Planning and Cost Estimation (ME8793)

C402.1	Explain Introduction to Process Planning
C402.2	Discuss the Process Planning Activities
C402.3	Explain the Introduction to Cost Estimation
C402.4	Explain the production Cost Estimation
C402.5	Explain the Machining Time Calculation and details

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DEPARTMENT OF MECHANICAL ENGINEERING (BE MECHANICAL ENGINEERING)

Course : Mechatronics (ME8791)

C403.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.
C403.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.
C403.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing
C403.4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.
C403.5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies

Course Name: Simulation & Analysis Laboratory (ME8711)

C407.1	Model and simulate simple mechanisms using MATLAB & ADAMS
C407.2	Model and analyse trusses, cables, beams with different support conditions
C407.3	Model and analyse plates and simple shells with different loading conditions
C407.4	Model and analyse axisymmetric components and cylindrical shells for thermal stresses
C407.5	Model and analyse beams for finding out natural frequencies

Course Name: Mechatronics Laboratory (ME8782)

C408.1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems.
C408.2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers
C408.3	Ability to understand the functioning of various types of transducers.
C408.4	Ability to understand the functioning of image processing technique.


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Course Name: Technical Seminar (ME8712)

C409.1	Determine a technical topic from the field of engineering and application
C409.2	Prepare presentation and report for the same topic
C409.3	Analyze a current topic of professional interest and present it before audience

Course Name: Principles of Management (ME8581)

C410.1	Understande the managerial functions like planning, organizing, staffing, leading & controlling
C410.2	The basic knowledge on international aspect of management
C410.3	The basic knowledge on management and its evolution
C410.4	A knowledge on budgetary control and their strategies
C410.5	A understanding of the motivational theories existing in the management

Course name : Production Planning and Control

C411.1	Explain various production control methods which can be applied to specific situations and state their relationship to the product/process involved.
C411.2	Make forecasts in the manufacturing and service sectors using selected quantitative and qualitative techniques.
C411.3	Apply the principles and techniques for planning and control of the production and service systems to optimize/make best use of resources.
C411.4	Understand the importance and function of inventory and to be able to apply selected techniques for its control and management under dependent and independent demand circumstances
C411.5	Demonstrate and explain the use of Manufacturing Requirements Planning (MRP2), Just - In - Time (JIT) techniques in terms of operation and their importance in Lean World Class Manufacturing.


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Course Name : Project Work (ME8811)

C413.1	Identify a topic in advanced areas of Mechanical Engineering and Identify methods and materials to carry out experiments/develop code
C413.2	Review literature to identify gaps and define objectives & scope of the work and Reorganize the procedures with a concern for society, environment and ethics
C413.3	Generate and implement innovative ideas for social benefit Analyze and discuss the results to draw valid conclusions
C413.4	Develop prototypes/models, experimental set-up and software systems necessary to meet the objectives and Prepare a report as per recommended format and defend the work
C413.5	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings


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M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

REGULATION – 2017

COURSE OUTCOMES

MA5165 Statistical Methods for Engineers (C101)

CO CODE	COURSE OUTCOME
C101.1	Obtain the value of the point estimators using the method of moments and method of maximum likelihood.
C101.2	Use various test statistics in hypothesis testing for mean and variances of large and small samples.
C101.3	Determine the regression line using the method of least square and also to calculate the partial and multiple correlation coefficient for the given set of data points.
C101.4	Test the hypothesis for several means using one way, two way or three way classifications.
C101.5	Get exposure to the principal component analysis of random vectors and matrices.

CN5101 Modern Construction Materials (C102)

CO CODE	COURSE OUTCOME
C102.1	Explain the various types of special concretes
C102.2	Select the different processing of steel and applications of coating
C102.3	Explain the manufacturing process and applications of polymer composites
C102.4	Identify the different flooring materials and application of façade materials
C102.5	Apply the knowledge of smart and intelligent materials in construction field


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CN5102 Construction Equipment (C103)

CO CODE	COURSE OUTCOME
C103.1	Develop knowledge on planning of equipment and selection of equipment
C103.2	Explain the knowledge on fundamentals of earth work operations, earth moving operations and types of earth work equipment
C103.3	Develop the knowledge on special construction equipment's
C103.4	Apply the knowledge on asphalt and concrete plants
C103.5	Apply the knowledge and select the proper materials handling equipment

CN5103 Construction Planning, Scheduling and Control (C104)

CO CODE	COURSE OUTCOME
C104.1	Identify and estimate the activity in the construction
C104.2	Schedule the networking of activities using critical path method
C104.3	Evaluate the project budget required for the particular construction project
C104.4	Recognize the various quality control tool required in the construction industry
C104.5	Explain the different databases that can be maintained in a construction industry using computers.

CN5001 Advanced Concrete Technology (C105)

CO CODE	COURSE OUTCOME
C105.1	Understand the testing of concrete making materials as per IS code and admixtures
C105.2	Know the procedure to determine the properties of fresh and hardened of concrete.


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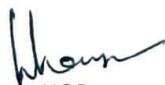
C105.3	Design of concrete mix and grade as per IS codes and ACI method.
C105.4	Describe the application and use of special concrete.
C105.5	Know the methods and techniques involved in the concrete for various structures.

CN5003 Quantitative Techniques in Management (C106)

CO CODE	COURSE OUTCOME
C106.1	Apply the knowledge of science and engineering fundamentals in learning the concept of operations research and its practical applicability for solving challenges in construction.
C106.2	Identify, formulate, plan and schedule construction engineering projects.
C106.3	Apply the knowledge of financial management and cost concepts.
C106.4	Design the required man, material, equipment, cost and time as per needs by proper decision rules.
C106.5	Analyze the cost by break-even analysis and modern construction management software.

CN5201 Advanced Construction Techniques (C107)

CO CODE	COURSE OUTCOME
C107.1	Understand the modern construction techniques used in the sub structure construction.
C107.2	Demonstrate knowledge and understanding of the principles and concepts relevant to super structure construction for buildings
C107.3	Understand the concepts used in the construction of special structures
C107.4	Knowledge on Various strengthening and repair methods for different cases.
C107.5	Identify the suitable demolition technique for demolishing a building.


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CN5202 Contract Laws and Regulations (C108)

CO CODE	COURSE OUTCOME
C108.1	Design the construction contracts
C108.2	Develop a skill for the tendering process.
C108.3	Explain the duties of the arbitrator.
C108.4	Develop an idea on the various legal requirements to be met in relation to land and construction.
C108.5	Identify and apply the provisions provided in the labour welfare schemes.

CN5203 Computer Applications in Construction Engineering and Planning (C109)

CO CODE	COURSE OUTCOME
C109.1	Use of software's in construction Industry.
C109.2	Apply various optimization techniques.
C109.3	Apply Deterministic and Probabilistic Inventory Models.
C109.4	Analyze the scheduling concepts.
C109.5	Solve problems using simulation and ERP systems.

CN5204 Economics and Finance Management in Construction (C110)

CO CODE	COURSE OUTCOME
C110.1	Describe the basic principles of Economic in construction
C110.2	Evaluate alternate proposals
C110.3	Evaluate alternative investments

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M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

C110.4	Select best source of finance for a project
C110.5	Manage the finance and accounting

CN5006 Construction Project Management (C111)

CO CODE	COURSE OUTCOME
C111.1	Identify the stages involved in a project and analyze the obligatory services to be taken up while performing a construction activity.
C111.2	Apply the professional skills acquired in managing a construction project.
C111.3	Develop the ability to attain an equilibrium among Innovation, Technology and Economic feasibility.
C111.4	Cultivate an idea on effective resource utilization and identify factors affecting job productivity.
C111.5	Estimate the cost of construction project.

CN5007 Construction Personnel Management (C112)

CO CODE	COURSE OUTCOME
C112.1	Identify, select and plan the manpower in construction project
C112.2	Strategize and classify the structure of organization and operations
C112.3	Interpret the human relations and significance of organisational behaviour
C112.4	Formulate welfare measure for personnel in construction sector
C112.5	Develop methods to manage quantitative and qualitative performance


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M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

CN5211 Advanced Construction Engineering and Computing Techniques (C113)

CO CODE	COURSE OUTCOME
C113.1	Compare and analyse the methods of mix proportioning and effect of admixtures in concrete
C113.2	Practice the test of NDT and workability tests on concrete
C113.3	Apply the analytical techniques and graphical analysis to interpret the experimental data
C113.4	Schedule project data and generate reports with graphical information
C113.5	Simulate the risks involved in construction project

CN5212 Practical Training I (C114)

CO CODE	COURSE OUTCOME
C114.1	Gained first-hand knowledge of practical problems in carrying out engineering tasks
C114.2	Gather knowledge in communication and interpersonal skills
C114.3	Developed skills in facing and solving the field problems

CN5301 Quality Control and Assurance in Construction (C201)

CO CODE	COURSE OUTCOME
C201.1	Achieve the knowledge of quality management guidelines, quality circles.
C201.2	Apply the quality standards for preparing Quality system documents.
C201.3	Explain the skill of preparing inspection procedures for quality planning.
C201.4	Select the techniques and tools for Quality Assurance and

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MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in
M.E CONSTRUCTION ENGINEERING AND MANAGEMENT

	Control in Construction Industry.
C201.5	Achieve the knowledge of quality improvement techniques

CN5010 Resource Management and Control in Construction (C202)

CO CODE	COURSE OUTCOME
C202.1	Identify the different types of resources in a construction industry
C202.2	Evaluate the labour productivity and the influencing factors
C202.3	Calculate the equipment output and its operation condition of construction equipment
C202.4	Describe the terms of cash inflow, cash outflow and balance sheet
C202.5	Categorize the time and cost related information's in a construction sector.

CN5011 Project Safety Management (C203)

CO CODE	COURSE OUTCOME
C203.1	Develop the knowledge on accidents and their causes
C203.2	Develop the knowledge about safety programmes safety programme job-site safety assessment
C203.3	Apply the knowledge contractual obligations
C203.4	Explain about designing for safety and safety procedures
C203.5	Develop the knowledge owners' and designers responsibility

CN5311 Practical Training II (C204)


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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CO CODE	COURSE OUTCOME
C204.1	Gained first-hand knowledge of practical problems in carrying out engineering tasks
C204.2	Gather knowledge in communication and interpersonal skills
C204.3	Developed skills in facing and solving the field problems

CN5312 Seminar (C205)

CO CODE	COURSE OUTCOME
C205.1	Work on a specific technical topic in CEM domain to acquire skills of oral presentation
C205.2	Acquire technical writing abilities for seminars and conferences
C205.3	Present the topic using visual aids and interact with students

CN5313 Project Work (C206)

CO CODE	COURSE OUTCOME
C206.1	Understand the problem areas in construction engineering and management
C206.2	Prioritize the objectives for the selected research area
C206.3	Application of literature data to frame methodology of phase 2


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CN5411 Practical Training III (C207)



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363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, Arcot Road, Kodambakkam, Chennai – 24
Approved by AICTE & Affiliated to Anna University
email Id: principal@msec.edu.in
Website : www.msec.edu.in
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CO CODE	COURSE OUTCOME
C207.1	Gained first-hand knowledge of practical problems in carrying out engineering tasks
C207.2	Gather knowledge in communication and interpersonal skills
C207.3	Developed skills in facing and solving the field problems

CN5412 Project Work (C208)

CO CODE	COURSE OUTCOME
C208.1	Apply literature survey from phase 1 to implement methodology
C208.2	Experiment the process involved and analyse the results
C208.3	Provide suggestions and recommendations for the objectives of project


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CHENNAI-600 024