



S J P N Trust's

Hirasugar Institute of Technology, Nidasoshi.

Inculcating Values, Promoting Prosperity

Approved by AICTE, Recognized by Govt. of Karnataka and Affiliated to VTU Belagavi.

ME_M.Tech

NAAC

Course Outcomes

2017-18

Course Outcomes (Year 2017-18)

SUB: Applied Mathematics

SUB CODE: 16MDE11

CO	After studying this course, students will be able to:
C101.1	Model some simple mathematical models of physical Applications.
C101.2	Find the roots of polynomials in Science and Engineering problems.
C101.3	Differentiate and integrate function for a given set of tabulated data, for Engineering Applications

SUB: Finite Element Method

SUB CODE: 16MDE12

CO	After studying this course, students will be able to:
C102.1	Define the element properties such as shape function and stiffness matrix for the various elements.
C102.2	Formulate element properties for 1D and 2D elements.
C102.3	Develop skill to solve simple Heat Transfer problems using the steps of FEM

SUB: Advanced Fluid Mechanics

SUB CODE: 16MTP13

CO	After studying this course, students will be able to:
C103.1	Understand and formulate the fluid flows, their kinematics and governing equations.
C103.2	Understand and analyze the Mechanics of laminar and turbulent flow.
C103.3	Apply and analyze N-S equations for complex engineering problems.
C103.4	Analyze and evaluate technical parameters in flow around bodies.
C103.5	Understand and apply the experimental techniques.

SUB: Thermodynamics & Combustion Engineering

SUB CODE: 16MTP14

CO	After studying this course, students will be able to:
C104.1	Apply laws of thermodynamics for the qualitative and quantitative analysis of energy interactions for the systems.
C104.2	Apply laws of thermodynamics to determine the properties of pure substances and gas mixtures.
C104.3	Determine the reaction rates of first, second and higher order reactions
C104.4	Understand the basic concept of combustion, flame propagation and types of flames.
C104.5	Understand the concept of flame stability



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Course Outcomes

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SUB: Non Conventional Energy System

SUB CODE:16MTP151

CO	After studying this course, students will be able to:
C105.1	Identify the renewable energy sources and their utilization
C105.2	Understand the basic concepts of the solar radiation and analyze the solar Thermal systems for their utilization
C105.3	Understand the principle of working of solar cells and their modern manufacturing techniques
C105.4	Understand the concepts of the ocean thermal energy conversion systems and their applications
C105.5	Understand the energy conversion from wind energy, geothermal energy, biomass, biogas, fuel cells and hydrogen

SUB: Thermal Engineering Measurement - Lab 1

SUB CODE: 16MTP16

CO	After studying this course, students will be able to:
C106.1	Perform experiments to determine the coefficient of discharge of flow measuring devices
C106.2	Conduct experiments on hydraulic turbines and pumps to draw characteristics.
C106.3	Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations.
C106.4	Identify exhaust emission, factors affecting them and report the remedies.
C106.5	Determine the energy flow pattern through the hydraulic machines and I C Engine
C106.6	Exhibit his competency towards preventive maintenance of IC engines.

SUB: Advanced Heat Transfer

SUB CODE: 16MTP21

CO	After studying this course, students will be able to:
C107.1	Summarize both the physics and the mathematical treatment of the advanced topics pertaining to the modes of heat transfer.
C107.2	Use principles of heat transfer to develop mathematical models for uniform and non-uniform fins
C107.3	Employ mathematical functions and heat conduction charts in tackling two- dimensional and three-dimensional heat conduction problems.
C107.4	Identify free and forced convection problems involving complex geometries with proper boundary conditions.
C107.5	Use the concepts of radiation heat transfer for enclosure analysis



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Course Outcomes

2017-18

SUB: Steam And Gas Turbines**SUB CODE: 16MTP22**

CO	After studying this course, students will be able to:
C108.1	Summarize the working principles of Gas and steam turbines nozzle and diffusers.
C108.2	Use the principles of thermodynamics to determine the performance of steam and gas turbines.
C108.3	Distinguish and demonstrate the working principle and performance of impulse and reaction turbines
C108.4	Explain the concepts of axial flow and centrifugal compressors
C108.5	Differentiate axial flow and radial flow gas turbines for their analysis.
C108.6	Identify the various losses associated with the turbines.

SUB: Advanced Power Plant Cycles**SUB CODE: 16MTP23**

CO	After studying this course, students will be able to:
C109.1	Distinguish the various power plant cycle and their working principles.
C109.2	Explain combustion phenomenon of different type of fuels and energy associated.
C109.3	Demonstrate the working principles of different components of power plant
C109.4	Explain the concepts of power generation by nuclear power plant.
C109.5	Differentiate axial flow and radial flow gas turbines for their analysis.
C109.6	Identify the design parameters and economics of power plant.

SUB: Theory of I C Engines**SUB CODE: 16MTP24**

CO	After studying this course, students will be able to:
C110.1	Distinguish different Fuel-air and actual cycles
C110.2	Demonstrate the different types of injection and carburetor systems
C110.3	Formulate the flow and combustion phenomenon for modeling
C110.4	Identify the various types of emissions ,noise and their control systems
C110.5	Recommend the suitable alternative fuel for IC Engine.

SUB: Thermal Power Station-I**SUB CODE: 16MTP251**

CO	After studying this course, students will be able to:
C111.1	Describe the working, operation and maintenance of a various steam generator components.
C111.2	Identify the arrangements of different flow systems their operation and maintenance and their effects on environment
C111.3	Estimate the working expenses, current scenario and trends in power generation.
C111.4	Asses the performance and suitability



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Course Outcomes

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SUB: Simulation Laboratory Projects On Thermal Engineering - Lab SUB CODE: 16MTP26

CO	After studying this course, students will be able to:
C112.1	Analyze and build the IC Engine models by developing MAT LAB /C codes
C112.2	Analyze and build the comprehensive fuel combustion models by developing MAT LAB /C codes
C112.3	Estimate adiabatic flame temperature of simple fuels models by developing MAT LAB /C codes
C112.4	Solve and Analyze the second order PDEs through MAT LAB /C codes by using FTCS, Dufort-Frankel, Lasoonen and Crank Nickelson models

SUB: Design Of Heat Transferequipments For Thermal Power Plant SUB CODE: 16MTP41

CO	After studying this course, students will be able to:
C113.1	Understand the physics and the mathematical treatment of typical heat exchangers.
C113.2	Employ LMTD and Effectiveness methods in the design of heat exchangers and analyze the importance of LMTD approach over AMTD approach.
C113.3	Examine the performance of double-pipe counter flow (hair-pin) heat exchangers.
C113.4	Design and analyze the shell and tube heat exchanger
C113.5	Understand the fundamental, physical and mathematical aspects of boiling and condensation.
C113.6	Classify cooling towers and explain their technical features.

SUB: Engine Flow And Combustion

SUB CODE: 16MTP422

CO	After studying this course, students will be able to:
C114.1	Understand the Engine inlet and exhaust flow systems
C114.2	Explain the phynomenon of I C Engine combustion and their pollutant formation
C114.3	Distinguish different combustion models of I C Engines
C114.4	Explain the emission norms and their controlling measures.



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Course Outcomes

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SEM: IV

SUB: Design And Analysis Of Algorithm Laboratory

SUB CODE: 15CSL47

CO	After studying this course, students will be able to:
C215.1	Develop Java programs to demonstrate Inheritance, Exception handling and multi-threading concepts.
C215.2	Develop a Java Program to demonstrate the stack operations.
C215.3	Develop the variety of algorithms using Greedy, dynamic programming and Backtracking techniques.
C215.4	Analyze the performance of sorting algorithms based on divide-and-conquer technique.

SEM: IV

SUB: : Microprocessor And Microcontrollers Lab

SUB CODE: 15CSL48

CO	After studying this course, students will be able to:
C216.1	Explain 80x86 instruction sets for assembly language.
C216.2	Solve the computing problems using assembly language.
C216.3	Experiment with hardware devices and interfacing them to x86 family
C216.4	Apply the knowledge of ARM processor fundamentals for simple problems.



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Course Outcomes

2017-18

SEM: V

SUB: Management and Entrepreneurship for IT Industry

SUB CODE: 15CS51

CO	After studying this course, students will be able to:
C301.1	Explain the basic concepts of management, planning, Organizing and Staffing.
C301.2	Summarize the appropriate leadership styles, motivation theories, communications, Coordination and controlling, methods
C301.3	Interpret the meaning of entrepreneur, entrepreneurship and role in economic development on India along with Identification of business opportunities and feasibility study
C301.4	Inferring the new ideas, Prepare project report based on guidelines of planning commission by utilizing the resources available effectively through ERP
C301.5	Explain the IPRs and institutional support in Micro and Small Enterprises as per the Indian Industrial Policy 2007.

SEM: V

SUB: Computer Networks

SUB CODE: 15CS52

CO	After studying this course, students will be able to:
C302.1	Explain principles of application layer protocols
C302.2	Identify transport layer services and infer UDP and TCP protocols
C302.3	Classify routers, IP and Routing Algorithms in network layer
C302.4	Explain the Wireless and Mobile Networks covering IEEE 802.11 Standard
C302.5	Explain Multimedia Networking and Network Management

SEM: V

SUB: Database Management System

SUB CODE: 15CS53

CO	After studying this course, students will be able to:
C303.1	Define, Identify and analyze database objects, enforce integrity constraints on a database using RDBMS.
C303.2	Use Structured Query Language (SQL) for database manipulation.
C303.3	Build simple database systems
C303.4	Develop application to interact with databases.



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Course Outcomes

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SEM: V

SUB: Automata Theory and Computability

SUB CODE: 15CS54

CO	After studying this course, students will be able to:
C304.1	Explain the fundamentals of automata theory and Theory of Computation.
C304.2	Construct Grammars and Automata (recognizers) for different language classes and their relative powers.
C304.3	Illustrate how to translate between different models of Computation (e.g. Deterministic and Non-deterministic)
C304.4	Apply the knowledge gained to prove or disprove various properties of formal languages. (E.g. RL, CFL etc.)
C304.5	Explain the core concepts relating to the theory of computation including decidability and complexity.

SEM: V

SUB: Introduction to Software Testing

SUB CODE: 15CS552

CO	After studying this course, students will be able to:
C305(P2).1	Derive the test cases for any given problem.
C305(P2).2	Compare the different testing techniques
C305(P2).3	Classify the problem into suitable testing model
C305(P2).4	Apply the appropriate technique for the design of flow graph.
C305(P2).5	Develop appropriate document for the software artefact.

SEM: V

SUB: Advanced Java & J2EE

SUB CODE: 15CS553

CO	After studying this course, students will be able to:
C305(P3).1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
C305(P3).2	Build client-server applications and TCP/IP socket programs
C305(P3).3	Illustrate database access and details for managing information using the JDBC API
C305(P3).4	Explain how servlets fit into Java-based web application architecture
C305(P3).5	Develop reusable software components using Java Beans



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SEM: V SUB: Dotnet Framework for Application Development SUB CODE: 15CS564

CO	After studying this course, students will be able to:
C306(O4).1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#.
C306(O4).2	Explain Object Oriented Programming concepts in C# programming language.
C306(O4).3	Develop custom interfaces for applications and leverage the available built-in interfaces in building complex applications.
C306(O4).4	Illustrate the use of generics and collections in C#.
C306(O4).5	Construct queries to query in-memory data and define own operator behavior.

SEM: V SUB: Computer Networks Laboratory SUB CODE: 15CSL57

CO	After studying this course, students will be able to:
C307.1	Analyze and Compare various networking protocols.
C307.2	Analyze and evaluate familiar networking protocols using NS2 / NS3.
C307.3	Demonstrate the working of different concepts of networking.

SEM: V SUB: DBMS Laboratory with Mini Project SUB CODE: 15CSL58

CO	After studying this course, students will be able to:
C308.1	Demonstrate creation and manipulation operations on database.
C308.2	Demonstrate the working of different concepts of DBMS
C308.3	Develop and demonstrate the project developed for an application.



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SEM: VI SUB: Cryptography, Network Security & Cyber Law SUB CODE: 15CS61

CO	After studying this course, students will be able to:
C309.1	Explain the concepts of Cyber security and cryptography.
C309.2	Apply the essential cryptographic algorithms for security.
C309.3	Illustrate key management issues and solutions.
C309.4	Explain security issues with respect to wireless LAN.
C309.5	Explain the need of cyber law and ethics.

SEM: VI SUB: Computer Graphics and Visualization SUB CODE: 15CS62

CO	After studying this course, students will be able to:
C310.1	Explain hardware, software and OpenGL Graphics Primitives.
C310.2	Illustrate Geometric transformations on both 2D and 3D objects.
C310.3	Apply concepts of clipping, color and Illumination Models in 2D and 3D objects.
C310.4	Apply the concepts of viewing and visible surface detection of 3D objects
C310.5	Explain curve generating concepts and interactive computer graphics using the OpenGL.

SEM: VI SUB: System Software & Compiler Design SUB CODE: 15CS63

CO	After studying this course, students will be able to:
C311.1	Explain system software such as assemblers and macro processors.
C311.2	Explain system software such as loaders and linkers
C311.3	Apply the concepts to develop lexical analyzers.
C311.4	Apply the concepts to develop syntax analyzers.
C311.5	Make use of translation technique for code generation.



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SEM: VI**SUB: Operating Systems****SUB CODE: 15CS64**

CO	After studying this course, students will be able to:
C312.1	Demonstrate need for Operating System and its types.
C312.2	Explain the multithreaded systems and scheduling algorithms.
C312.3	Illustrate the concept of process synchronization and Deadlock.
C312.4	Explain the concept of memory management and File System.
C312.5	Illustrate the different concepts of OS in platform of usage through case studies.

SEM: VI**SUB: Data Mining & Data Warehousing****SUB CODE: 15CS651**

CO	After studying this course, students will be able to:
C313.1	Outline the multidimensional data mining and data model schemas
C313.2	Identify data mining problems and implement the data warehouse
C313.3	Construct association rules for a given data pattern.
C313.4	Choose appropriate classifiers to solve the problem.
C313.5	Choose appropriate clustering techniques to solve the problem.

SEM: VI**SUB: Python Application Programming****SUB CODE: 15CS664**

CO	After studying this course, students will be able to:
C314.1	Make Use of Python syntax and semantics for flow control and functions.
C314.2	Demonstrate proficiency in handling Strings and File Systems.
C314.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C314.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C314.5	Develop exemplary applications related to Network Programming, Web Services and Databases in Python.



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SEM: VI SUB: System Software & Operating System Laboratory SUB CODE: 15CSL67

CO	After studying this course, students will be able to:
C315.1	Demonstrate the Lexical analysis using Lexer.
C315.2	Demonstrate the syntax analysis phase of Compiler design using Parser.
C315.3	Develop the different CPU scheduling algorithms.
C315.4	Demonstrate the different memory management algorithms.
C315.5	Demonstrate the deadlock handling algorithm.

SEM: VI SUB: Computer Graphics Laboratory with mini Project SUB CODE: 15CSL68

CO	After studying this course, students will be able to:
C316.1	Demonstrate simple algorithms using OpenGL Graphics Primitives and attributes.
C316.2	Demonstrate line drawing and clipping algorithms using OpenGL functions.
C316.3	Demonstrate 2D and 3D Geometric transformations using OpenGL functions.
C316.4	Demonstrate computer graphics applications using OpenGL.
C316.5	Make use of OpenGL functions to animate real world problems.



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ME_M.Tech**NAAC****Course Outcomes****2017-18****SEM: VII****SUB: Object Oriented Modeling & Design****SUB CODE: 10CS71**

CO	After studying this course, students will be able to:
C401.1	Explain Object Orientation and Modeling concepts.
C401.2	Construct class Model, state model and interaction model to solve problems.
C401.3	Make use of domain analysis, application analysis, system design and class design to solve problems.
C401.4	Explain legacy systems.
C401.5	Illustrate the design patterns

SEM: VII**SUB: Embedded Computing Systems****SUB CODE: 10CS72**

CO	After studying this course, students will be able to:
C402.1	Explain Embedded System design process for complex system using microprocessors.
C402.2	Identify the instruction sets for ARM processor and memory system mechanism.
C402.3	Explain Bus base computer system and program design and analysis.
C402.4	Illustrate the concepts of real time operating system (RTOS).
C402.5	Classify different networks for embedded system design.
C402.6	Illustrate the integrated development environment (IDE) and different debugging techniques.

SEM: VII**SUB: Programming the Web****SUB CODE: 10CS73**

CO	After studying this course, students will be able to:
C403.1	Explain the basic concepts of World Wide Web (WWW).
C403.2	Demonstrate the imposing of JavaScripts and CSS stylesheets in XHTML document.
C403.3	Develop XHTML document using JavaScript for user data processing and validation; and describe document object model techniques.
C403.4	Develop XML document by using suitable Document Type Definition, Schema and Namespace.
C403.5	Develop XHTML document with Common Gateway Interface (CGI) and Database Interface (DBI) standards.
C403.6	Develop XHTML document using PHP script and RoB (Ruby on Rail) framework for user data processing and database applications.



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SEM: VII**SUB: Advanced Computer Architecture****SUB CODE: 10CS74**

CO	After studying this course, students will be able to:
C404.1	Explain the fundamentals of computer architecture.
C404.2	Explain the basic concepts of Pipelining.
C404.3	Explain Internal Data Forwarding, Software Interlocking, Hardware Score boarding, Hazard avoidance, Branch handling and Instruction issuing techniques.
C404.4	Explain multi-processor and thread level parallelism.
C404.5	Apply memory organization and optimization techniques.
C404.6	Compare the concepts of Very Long Instruction Word (VLIW) and Explicitly Parallel Instruction Computing (EPIC).

SEM: VII**SUB: JAVA AND J2EE****SUB CODE: 10CS753**

CO	After studying this course, students will be able to:
C405(B3).1	Explain & develop the java programs using object oriented concepts.
C405(B3).2	Develop the multi-threading and event handling programs.
C405(B3).3	Develop simple event based Graphical User Interfaces using Applets and Swings.
C405(B3).4	Explain the overview of Java Database Connectivity (JDBC) process.
C405(B3).5	Develop the servlets and Java Server Pages (JSP) programs.
C405(B3).6	Explain the Enterprise Java Beans (EJB).

SEM: VII**SUB: C# & .NET Concepts****SUB CODE: 10CS761**

CO	After studying this course, students will be able to:
C406(C1).1	Explain the philosophy of .NET platform.
C406(C1).2	Build simple C# applications.
C406(C1).3	Illustrate the object oriented programming using C# fundamentals.
C406(C1).4	Explain exceptions, object lifetime, Interfaces and Collections in C#.
C406(C1).5	Illustrate callback interfaces, delegates and events.
C406(C1).6	Explain .NET Assemblies.



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Course Outcomes

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SEM: VII

SUB: Storage Area Networks

SUB CODE: 10CS765

CO	After studying this course, students will be able to:
C406(C5).1	Explain the components of datacenter, disk drive components and its performance.
C406(C5).2	Compare RAID Levels and enhance performance of the system using Intelligent Storage System (ISS).
C406(C5).3	Explain the concepts of DAS, iSCSI protocols, NAS and FC SAN.
C406(C5).4	Explain CAS system to store fixed content and virtualization techniques to enhance the performance.
C406(C5).5	Explain the concept of business continuity, Backup and Recovery methods.
C406(C5).6	Explain replication and data security methods.

SEM: VII

SUB: Networks Laboratory

SUB CODE: 10CSL77

CO	After studying this course, students will be able to:
C407.1	Analyze and Compare various networking protocols.
C407.2	Analyze and evaluate familiar networking protocols using NCTUNS.
C407.3	Demonstrate the working of different concepts of networking.

SEM: VII

SUB: Web Programming Laboratory

SUB CODE: 10CSL78

CO	After studying this course, students will be able to:
C408.1	Demonstrate Configuration of Apache Web Server and MySQL Database Server.
C408.2	Develop Web Pages using CSS and Javascript
C408.3	Develop XML document and display using CSS and XSLT.
C408.4	Develop Perl Scripts to demonstrate basic perl features
C408.5	Demonstrate use of Cookies and session variables using PHP Script
C408.6	Develop DB application using server side scripts such as Perl, PHP and Ruby on Rails



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SEM: VIII**SUB: Software Architecture****SUB CODE: 10IS81**

CO	After studying this course, students will be able to:
C409.1	Explain the basic concepts of software architecture and software architectural business cycle.
C409.2	Explain various architectural styles with case studies.
C409.3	Explain various quality attributes of software architecture and tactics to achieve them.
C409.4	Illustrate the concepts of various architectural patterns.
C409.5	Illustrate the concepts of some design patterns.
C409.6	Explain the concept of designing and documenting software architecture.

SEM: VIII**SUB: System Simulation & Modeling****SUB CODE: 10CS82**

CO	After studying this course, students will be able to:
C410.1	Apply basic concepts of system simulation to solve problems on queuing systems.
C410.2	Develop a common framework for the modeling of complex system by using discrete-event simulation.
C410.3	Explain the basic concepts of discrete, continuous and empirical distributions.
C410.4	Make use of congruential and Inverse Transform techniques to generate random number & random variates respectively.
C410.5	Explain input models and estimate the performance of systems using output models.
C410.6	Explain the verification, validation and optimization of simulation models by comparing with the real systems.

SEM: VIII**SUB: Information & Network Security****SUB CODE: 10CS835**

CO	After studying this course, students will be able to:
C411(D5).1	Explain the policies and standards of information security.
C411(D5).2	Explain different security technologies such as firewalls, Virtual Private Networks, Intrusion Detection and Prevention Systems.
C411(D5).3	Illustrate the concepts of network security and cryptography.
C411(D5).4	Explain application specific security mechanisms of E-mail and Web access.
C411(D5).5	Explain the concepts of IP Security.



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SEM: VIII

SUB: Software Testing

SUB CODE: 10CS842

CO	After studying this course, students will be able to:
C412(E2).1	Explain the perspective of testing with examples.
C412(E2).2	Make use of testing methods to derive test cases.
C412(E2).3	Explain the concepts of path, data flow, integration, system and interaction testing.
C412(E2).4	Illustrate the basic principles of software testing process.
C412(E2).5	Explain fault based testing and test execution.
C412(E2).6	Develop testing documents after planning and monitoring the process.