	2.6	Student Performance and Learning Outcome
	2.6.1	Teachers and students are aware of the stated Programme and course outcomes of the Programmes offered by the institution



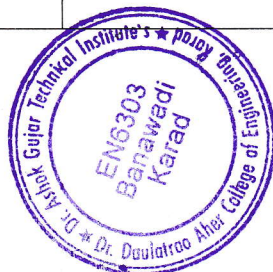
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Course Outcomes

Engineering Mathematics I			
Sr.No	Course Code	Course Outcomes Statement	Bloom Taxonomy
1	BSC-M-I-102.1	Determine The Rank of Matrix & Solve Homogeneous and Non-Homogeneous Linear Equations	BL3 Apply
2	BSC-M-I-102.2	Calculate The Eigen Value and Eigen Vectors	BL3 Apply
3	BSC-M-I-102.3	Compute Roots of Equation by Using Knowledge of Complex No	BL1 Remember, BL3 Apply
4	BSC-M-I-102.4	Define Expansion of Function by Using Taylor's Theorem & Maclaurin's Theorem & Evaluate Limit of Function by Using Indeterminate Form	BL1 Remember, BL5 Evaluate
5	BSC-M-I-102.5	Define Partial Derivates & Apply to Find Maxima, Minima & Jacobian of Function of Two Variables	BL1 Remember, BL3 Apply
6	BSC-M-I-102.6	SOLVE NUMERICALLY SYSTEM OF LINEAR EQUATIONS	BL3 APPLY
Engineering Mathematics II			
1	BSC-M-202.1	Solve The Ordinary Differential Equations	BL3 APPLY
2	BSC-M-202.2	Using The Knowledge of Ordinary Differential Equations to Solve the Examples on Orthogonal Trajectories, Electrical Circuits & Newton's Law of Cooling	BL1 REMEMBER, BL3 APPLY




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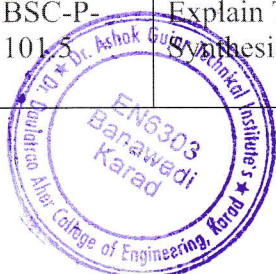
Basic Science & Humanities Department

Course Outcomes

3	BSC-M-202.3	Solve Numerically the First Order Differential Equations	BL3 APPLY
4	BSC-M-202.4	Solve Numerically Algebraic and Transcendental Equations	BL3 APPLY
5	BSC-M-202.5	Evaluate Integration by Using Gamma and Beta Functions	BL5 EVALUATE
6	BSC-M-202.6	Evaluate Double Integrals and Use It to Solve Engineering Problems	BL3 APPLY, BL5 EVALUATE

Engineering Physics

1	BSC-P-101.1	Use The Principle of Interference, Diffraction and Polarization in Thin Reflecting Films, Diffraction Gratings and Polarimeter.	BL3 APPLY
2	BSC-P-101.2	Explain The Basics of Laser Production and Its Applications. Apply The Concept of Optical Fibers in Light Wave Communication Systems and In Holography.	BL2 UNDERSTAND, BL3 APPLY
3	BSC-P-101.3	Apply Thre Knowledge of Architectural Acoustics for Acoustically Good Halls, Auditoriums.	BL3 APPLY
4	BSC-P-101.4	Recognize Various Planes in A Crystal and Describe the Structure determination Using X-Ray.	BL2 UNDERSTAND, BL3 APPLY
5	BSC-P-101.5	Explain The Properties of Nano Materials, And Synthesis Methods and Basic Tools.	B12 Understand



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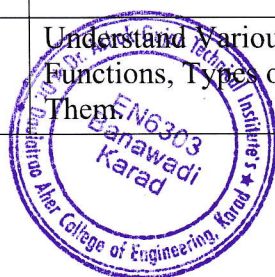
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Course Outcomes

6	BSC-P-101.6	Understand Wave Particle Dualism on The Basis of Quantum Theory.	B12 Understand
Basic Electrical Engineering			
1	ESC-P-103.1	Define Various Parameters Related to Electric & Magnetic Circuits and Derive Various Parameters in Electrical Circuits & Equipment.	B11 Remember, B13 Apply
2	ESC-P-103.2	Apply Conceptual Understanding to Solve Numerical Related to Dc Circuits, Magnetic Circuits, Single Phase & Three Phase Ac Circuits.	B13 Apply
3	ESC-P-103.3	Suggest An Illumination System for A Selected Location.	B13 Apply
4	ESC-P-103.4	Sketch And Explain Construction, Working, Characteristics & Applications of Transformer, Alternator, Single Phase Ac Motor & Universal Motor.	B12 Understand, B13 Apply
5	ESC-P-103.5	Apply Conceptual Understanding to Solve Numerical Related to Ac Circuit and Single-Phase Transformer.	B13 Apply
Basic Civil Engineering			
1	ESC-P-104.1	Understand Application of Civil Engineering & Rules & Regulations to Be Followed for Building Planning.	B12 Understand, B13 Apply
2	ESC-P-104.2	Understand Various Building Components & Their Functions, Types of Load & Difference Between Them.	B12 Understand, B13 Apply



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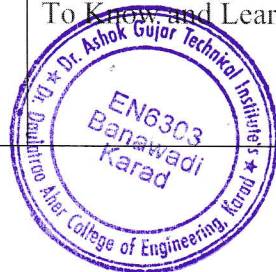
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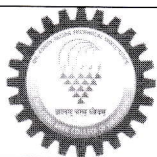
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Course Outcomes

3	ESC-P-104.3	Recognize The Important Properties of Building Materials & Their Suitability.	B13 Apply, B14 Analyze
4	ESC-P-104.4	To Use of Different Surveying & Leveling Instruments to Know the Topography of Ground.	B13 Apply, B14 Analyze
5	ESC-P-104.5	To Know Components of Roads, Railway Tracks, Water Supply Scheme & Types of Dams.	B13 Apply
Engineering Graphics			
1	BSH105.1	Construct The Ellipse, Parabola, Hyperbola, Cycloid, Spiral and Involute Curves.	B13 Apply
2	BSH105.2	Sketch Projection of Simple Geometries [Point, Line, Planes, And Solids].	B13 Apply
3	BSH105.3	Sketch Sectional Views of Solids & Development the Lateral Surfaces of Solids.	B13 Apply
4	BSH105.4	Sketch The Orthographic Projection.	B12 Understand, B13 Apply
5	BSH105.5	Sketch The Isometric of Simple Objects.	B12 Understand, B13 Apply
Professional Communication I			
1	HM-I-106.1	To Understand the Nature and Type Of Communication.	B13 Apply
2	HM-I-106.2	To Know, and Learn the Skills of Language	B13 Apply



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Course Outcomes

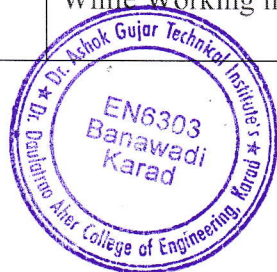
3	HM-I-106.3	To Know the Science of Phonetics	B12 Understand
4	HM-I-106.4	To Understand and Acquire the Oral Skills	B13 Apply
5	HM-I-106.5	To Learn and Apply the Professional Writing Skills.	B13 Apply

Professional Communication II

1	HM-II-206.1	To Understand and Learn the Writing Skills	B12 Understand, B13 Apply
2	HM-II-206.2	To Learn Professional Behavioral Skills	B12 Understand, B13 Apply
3	HM-II-206.3	To Acquire Presentation Skills	B12 Understand, B13 Apply
4	HM-II-206.4	To Learn the Required Career Skills	B12 Understand

Engineering Workshop Practice –I

1	ESC-W-I-107.1	To Understand Safety Norms and Safety Equipment While Working in Shop.	B12 Understand
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Course Outcomes

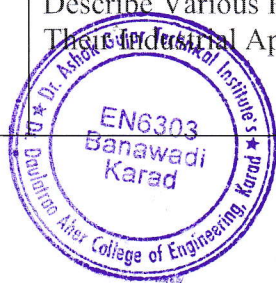
2	ESC-W-I-107.2	To Select Suitable Tools and Equipment to Prepare Joints Using Bench-Work Tools.	B11 Remember
3	ESC-W-I-107.3	To Produce Component / Joints Using Materials of Specific Shape and Size by A Suitable, Set of Operations.	B13 Apply

Engineering Workshop Practice –Ii

1	ESC-W-II-207.1	To Select Suitable Tools and Equipment to Prepare Joints Using Bench-Work Tools	B11 Remember
2	ESC-W-II-207.2	To Produce Joints Using Materials of Specific Shape and Size by A Suitable Set of Operations and Check the Accuracy of Shape and Dimensions Using Inspection Methods	B13 Apply
3	ESC-W-II-207.3	To Understand the Air Pollution and Its Causes with Testing	B12 Understand

Engineering Chemistry

1	BSC-C-201.1	Understand The Basic Concept in Chemistry and Its Utilization	B12 Understand
2	BSC-C-201.2	Determine The Hardness Alkalinity and Chloride Content of Water and Its Importance in Our Life	B13 Apply
3	BSC-C-201.3	Describe Various Polymer Materials to Understand Their Industrial Application	B13 Apply



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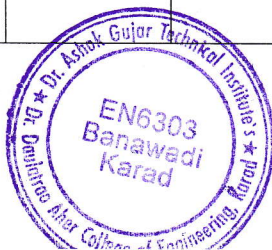
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Course Outcomes

4	BSC-C-201.4	Study Of Instruments and Its Applications	B13 Apply, B14 Analyze
5	BSC-C-201.5	Study Of Metallic Material and Its Application in Industrial Chemistry	B12 Understand, B13 Apply, B14 Analyze
6	BSC-C-201.6	Determine The Calorific Value of Solid Liquid and Gaseous Sample	B14 Analyze, B15 Evaluate

Fundamentals Of Electronics & Telecommunication

1	ESC110.1	Students Understand Construction, Biasing, V-I Characteristics and Application of Diode and Bjt.	B12 Understand
2	ESC110.2	Students Understand Basics of Digital Electronics	B12 Understand
3	ESC110.3	Students Understand Basic Applications of Transducers and Appliances Acquire the Essential Knowledge Of Computer System & Peripherals	B12 Understand
4	ESC110.4	Acquire The Essential Knowledge of Computer System & Peripherals.	B12 Understand, B13 Apply
5	ESC110.5	Understand Operating System Features and Practice Application Software.	B12 Understand
6	ESC110.6	Demonstrate Use of Computer Networks and Internet.	B12 Understand, B13 Apply



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Course Outcomes

Applied Mechanics			
1	ESC-C-104.1	To Study Understand the Basic Concepts of Mechanics.	B12 Understand
2	ESC-C-104.2	To Study Problems on Equilibrium of Rigid Bodies, Friction.	B12 Understand
3	ESC-C-104.3	To Study Centroid & Moment of Inertia, Kinematics & Las of Motion with Problem.	B12 Understand
4	ESC-C-104.4	To Know basic Concepts Linear & Rectilinear Motion, Work Energy Principle, DE-Alembert Principle.	B12 Understand
5	ESC-C-104.5	To Understand Basic Concepts of Kinetics of Linear Motion, Principle, DE	B12 Understand
6	ESC-C-104.6	To Study Collision of Elastic Bodies.	B12 Understand



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Course Outcomes

BSC-CS301 Applied Mathematics	
BSC-CS301.1	Describe the statistical data numerically by using Lines of regression and Curve fittings.
BSC-CS301.2	Solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions.
BSC-CS301.3	Calculate numerical Integration
BSC-CS301.4	Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, Normality, support, etc.
BSC-CS301.5	Solve examples on the principle in performing fuzzy number arithmetic operations such as Addition, Multiplication & fuzzy equation.
BSC-CS301.6	Solve assignment problems by using different techniques of operation research.

PCC-CS302 Discrete Mathematics & Structures	
PCC-CS302.1	Apply logic concepts in designing a program.
PCC-CS302.2	Illustrate basic set concepts & apply operations on set.
PCC-CS302.3	Minimize the Boolean Function.
PCC-CS302.4	Apply basic concepts of probability to solve real world problem.
PCC-CS302.5	Represent data structures using graph concepts.
PCC-CS302.6	Design abstract machine, detect deadlocks.





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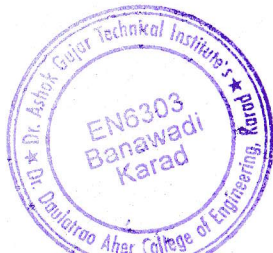
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Course Outcomes

PCC-CS303 Data Structures	
PCC-CS303.1	Identify the appropriate data structure for specific application.
PCC-CS303.2	Design and analyze programming problem statements.
PCC-CS303.3	Chose appropriate sorting and searching algorithms.
PCC-CS303.4	Outline the solution to the given software problem with appropriate data structure.

PCC-CS304 Computer Networks – I	
PCC-CS304.1	Demonstrate concepts of Computer Networks.
PCC-CS304.2	Explain OSI and TCP/IP layered architecture
PCC-CS304.3	Implement network and data link layer.
PCC-CS304.4	Demonstrate TCP protocol in detail.
PCC-CS304.5	To analyze the protocol structure using network analyzing tools.
PCC-CS304.6	Apply the principals of socket programming in the networks.

PCC-CS305 Microprocessors	
PCC-CS305.1	Describe the Architecture of 8085 microprocessors and microcontroller.




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Course Outcomes

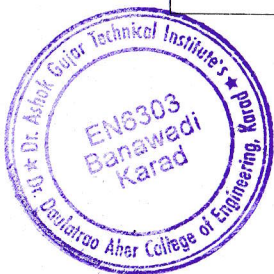
PCC-CS305.2	Classify the 8086 Assembly Instructions set and use in Assembly language Programs.
PCC-CS305.3	Explain Programming model's of 8086 microprocessors.
PCC-CS305.4	Classify the 8086 Assembly Instructions set and use in Assembly language Programs.
PCC-CS305.5	Understand the higher processor architecture.
PCC-CS305.6	Understand the need for other Microprocessors.

PCC-CS306 C Programming

PCC-CS306.1	Articulate the principles of procedure oriented problem solving and programming.
PCC-CS306.2	Explain programming fundamentals including statements, control flow and recursion.
PCC-CS306.3	Able to formulate problems and implement algorithms in C.
PCC-CS306.4	Analyze and use data structures to solve the complex problem statements.
PCC-CS306.5	Demonstrate file operations using file handling concepts through developing applications.

HM-CS307 Soft Skills

HM-CS307.1	Effectively communicate through verbal/oral communication and improve the listening Skills.
HM-CS307.2	Actively participate in group discussion / meetings / interviews and prepare & deliver presentations.
HM-CS307.3	Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.




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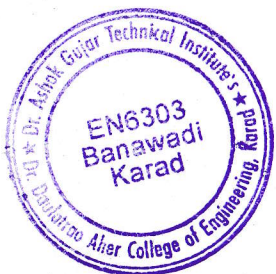
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Course Outcomes

PCC-CS401 Automata Theory	
PCC-CS401.1	Understand basic concepts of Regular Language and Regular Expressions.
PCC-CS401.2	Select appropriate abstract machine to recognize a given formal language.
PCC-CS401.3	Generate complex languages by applying Union, Intersection, Complement, Concatenation and Kleene * operations on simple languages.
PCC-CS401.4	Apply parsing concepts for syntax analysis.
PCC-CS401.5	Be familiar with thinking analytically and intuitively for problem solving situations in related areas of theory in computer science.

PCC-CS402 Computer Networks-II	
PCC-CS402.1	Program the client server model using sockets
PCC-CS402.2	Understand and apply next generation protocol and addressing model
PCC-CS402.3	Elaborate the fundamentals of Domain Name Systems
PCC-CS402.4	Apply the concepts of Remote login and FTP in network applications
PCC-CS402.5	Learn fundamentals of web, HTTP and e-mail communication protocols.
PCC-CS402.6	Understand multimedia streaming and relevant protocols.

PCC-CS403 Computer Organization and Architecture	
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Course Outcomes

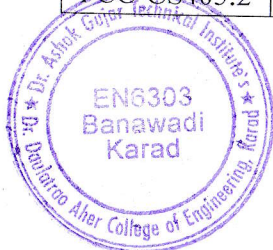
PCC-CS403.1	Recapitulate the history of computer system and the basic concepts of computer architecture and organization.
PCC-CS403.2	Understand the concept of I/O organization.
PCC-CS403.3	Apply the different algorithms to perform arithmetic operations.
PCC-CS403.4	Articulate the design issues in the development of processor.
PCC-CS403.5	Conceptualize instruction level parallelism.
PCC-CS403.6	Understand the concept of memory techniques.

PCC-CS404 Operating System-I

PCC-CS404.1	Explain the core concept of operating system, its role, operations, types of operating system, its monolithic structure
PCC-CS404.2	Describe the terminologies of processes, threads, synchronization approaches and race conditions.
PCC-CS404.3	Analyze different scheduling policies and its performance criteria's with respect to scheduling policies
PCC-CS404.4	Devise the problem of deadlock and design the solutions for handling deadlock, detection of deadlock and its resolution
PCC-CS404.5	Outline the concept of memory management, allocation strategies basics of virtual memory, demand paging and page replacement policies
PCC-CS404.6	Demonstrate the hands-on of Linux commands, system calls and file related utilities

PCC-CS405 Software Engineering

PCC-CS405.1	Comprehend systematic methodologies of SDLC(Software Development Life Cycle)
PCC-CS405.2	Discriminate competing and feasible system requirements indicating correct real world problem scope and prepare stepwise



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	system conceptual model using stakeholder analysis and requirement validation.
PCC-CS405.3	Prepare SRS document for a project
PCC-CS405.4	Apply software design and development techniques
PCC-CS405.5	Develop a quality software project through effective team-building, planning, scheduling and risk
PCC-CS405.6	Understand testing methods at each phase of SDLC

PCC-CS406 Object Oriented Programming	
PCC-CS406.1	Use the characteristics of an object-oriented programming language in program.
PCC-CS406.2	Use the basic object-oriented design principles in computer problem solving.
PCC-CS406.3	Use the basic principles of software engineering in managing complex software project.
PCC-CS406.4	Program with advanced features of the C++ programming language.
PCC-CS406.5	Develop programs in the LINUX programming environment.

PW-CS407 Mini Project	
PW-CS407.1	Define the problem statement.
PW-CS407.2	Organize, Plan and prepare the detailed project activities.
PW-CS407.3	Construct Flowchart, System Architecture based on the project description
PW-CS407.4	Implement the solution for their problem.





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PCC - CS501 Information Security	
PCC-CS501.1	Understand principles of Crypto-systems.
PCC-CS501.2	Compare and analyze various security services and mechanisms.
PCC-CS501.3	Apply and use the features of PGP, S/MIME, DSA, IPSec, SSL in their profession.
PCC-CS501.4	Take precautions of their personal computing system from possible threats and attacks.
PCC-CS501.5	Explore newer vulnerabilities and provide the solutions to them.

PCC - CS502 System Programming	
PCC-CS502.1	Student will be able to identify the role of system programs and application programs.
PCC-CS502.2	Student will be able to understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.
PCC-CS502.3	Students able to describe the various concepts of assemblers and macro - processors.
PCC-CS502.4	Students able to understand the various phases of compiler and compare its working with assembler
PCC-CS502.5	Students understand how linker and loader create an executable program from an object module created by assembler and compiler.
PCC-CS502.6	Students will be able to create graphical user interfaces for basic programs and learn about terminal input/output through the termios libraries.





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PCC - CS503 Object Oriented Modeling and Design	
PCC-CS503.1	Ability to analyze and model software systems
PCC-CS503.2	Ability to construct OO view of the system
PCC-CS503.3	Ability to design a Software System using OMT design techniques.
PCC-CS503.4	Ability to design a Software System using UML design techniques.

PCC - CS504 Computer Algorithms	
PCC-CS504.1	Understand and demonstrate algorithm design methods with analysis
PCC-CS504.2	Devise algorithm for given problem statement and analyze its space and time complexity by using recurrence relation
PCC-CS504.3	Categorize the problem to determine polynomial and non-polynomial based on its nature
PCC-CS504.4	Understand and demonstrate basic concepts of parallel algorithms

OEC - CS506 Internet of Things	
OEC-CS506.1	Students will understand basic concepts of IoT
OEC-CS506.2	Students will be able to learn and implement RFID technology in various applications.
OEC-CS506.3	Students will be able to write programs for basic applications
OEC-CS506.4	Student will understand and implement different communication technologies in IoT systems.





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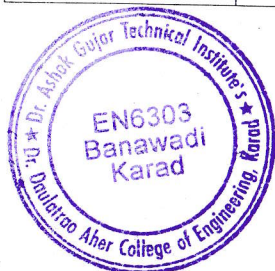
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PCC - CS507 Java Programming	
PCC-CS507.1	Students will be able to articulate the principle of object-oriented problem solving & programming.
PCC-CS507.2	Students will be able to illustrate code reusability, security and abstraction using inheritance, package and interface.
PCC-CS507.3	Students will be able to develop reliable and user-friendly applications using exception handling and file handling.
PCC-CS507.4	Students will be able to create desktop apps using SWING and event handling and also illustrate multithreading concepts.
PCC-CS507.5	Students will be able to use JDBC & collection framework.
PCC-CS507.6	Students will be able to apply network programming concept & develop web applications using servlet and jsp.

HM - CS508 Business English	
HM-CS508.1	Learn to communicate with others in practical
HM-CS508.2	Learn to express themselves in English with greater fluency
HM-CS508.3	Learn to handle themselves in English in a variety of business contexts, from negotiating, to using the telephone, to making presentations, to socialising
HM-CS508.4	Enhance the skills of listening, speaking, pronunciation skills, as well as business vocabulary
HM-CS508.5	Acquire the communicative competencies crucial for appropriate workplace behavior

PCC - CS601 Compiler Construction	
PCC-CS601.1	Recall the compiler phases and compiler construction tools like LEX and YACC.




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Course Outcomes

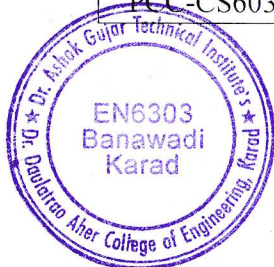
PCC-CS601.2	To design and implement Lexical Analyzer for a simple language.
PCC-CS601.3	To design and implement Syntax analyzer for a simple expression.
PCC-CS601.4	To apply Syntax directed translations and Syntax Directed definitions to generate intermediate code.
PCC-CS601.5	To identify appropriate code optimizing transformation for the given code.
PCC-CS601.6	To explain concept of code generation.

PCC - CS602 Operating System -II

PCC-CS602.1	To understand UNIX kernel, its architectural components like file subsystem, process control subsystem, memory management.
PCC-CS602.2	To understand a concrete way (UNIX i-nodes) of organizing a file system on a physical storage medium.
PCC-CS602.3	To maintain UNIX directories, files, manage processes, manipulate data with proper use of pipes and file redirection, UNIX filters.
PCC-CS602.4	To implement and handle various UNIX system calls.
PCC-CS602.5	To explain the principles of paging, virtual memory (VM) and describe the data structures and components (both hardware and software) that are necessary to implement it.
PCC-CS602.6	To perform shell programming involving decision control, looping and control flow statements on UNIX based machines.

PCC - CS603 Database Engineering

PCC-CS603.1	Understand fundamentals of database management systems.
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PCC-CS603.2	Represent logical design of database using E-R Diagram.
PCC-CS603.3	Analyze & construct good database design.
PCC-CS603.4	Apply SQL queries to design & manage the database.
PCC-CS603.5	Understand transactions, concurrency control and apply to database system.
PCC-CS603.6	Understand failures in database and appropriate recovery techniques.

PCC - CS604 Machine Learning	
PCC-CS604.1	Explain Machine Learning concepts.
PCC-CS604.2	Analyze the Machine Learning model.
PCC-CS604.3	Design solution using Machine Learning techniques.
PCC-CS604.4	To tackle real world problems in domain of data mining, information retrieval, computer vision, linguistics and bioinformatics, etc.

OEC - CS606 Cyber Security	
OEC-CS606.1	Student will be able to Explain the cyber security concepts.
OEC-CS606.2	Student will be able to Describe the cyber security vulnerabilities and prevention techniques.
OEC-CS606.3	Student will be able to Explain the different rules and regulations under I.T. ACT.



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OEC-CS606.4	Student will be able to Explain the concepts of digital forensics & incident management
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PCC - CS607 C# Programming	
PCC-CS607.1	Students will be able to develop correct, well-documented programs using the C# programming language.
PCC-CS607.2	Students will be able to learn to develop object-oriented programs using C# classes and objects
PCC-CS607.3	Students will be able to learn to use Windows Forms and WPF to create GUI-based programs
PCC-CS607.4	Students will be able to build networking and multithreading based programs using C#
PCC-CS607.5	Students will be able to design web applications using ASP.NET using ASP.NET controls in web applications.
PCC-CS607.6	Students will be able to debug and deploy ASP.NET web applications and create database driven ASP.NET web applications.

PW - CS608 Domain Specific Mini-project	
PW-CS608.1	Identify specific problem statement from a selected domain.
PW-CS608.2	Analyze the problem and prepare SRS and design document.
PW-CS608.3	Write code and carry out testing.
PW-CS608.4	Write a report covering details of the project and give presentation on a project.




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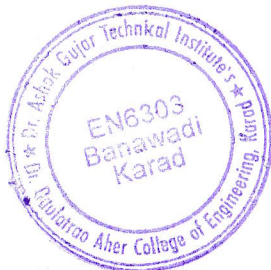
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Course Outcomes

CS401 Advanced Computer Architecture	
CS 401.1	Explain different types of computer architectures
CS 401.2	Classify different pipeline processor architectures and system-level design processes
CS 401.3	Distinguish the components and operation of a memory hierarchy and the range of performance issues influencing its design.
CS 401.4	Illustrate different techniques to enhance the performance of parallel application on different architectures
CS 401.5	Analyze the organization and operation of current generation parallel computer systems, including multiprocessor and multicore systems.
CS 401.6	Analyze and compare the performance of different CPU architecture

CS402 Distributed Systems	
CS 402.1	Understand various Functions of Distributed System
CS 402.2	Recognize and classify grid and cloud Computing and different virtualization techniques.
CS 402.3	Interpret the knowledge about current technology used to built architecture to enhance distributed computing infrastructure
CS 402.4	Illustrate the past and current research issues in the field of distributed systems
CS 402.5	Recognize issues related to multi-level interoperability across a distributed infrastructure and across multiple heterogeneous and distributed resources in a dynamically changing computing environment
CS 402.6	Identify new challenges in cloud computing




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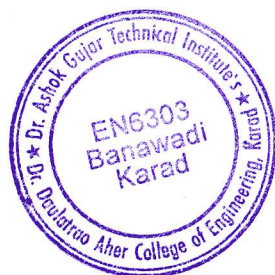
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Course Outcomes

CS403 Advanced Database Systems	
CS 403.1	Classify different types of database
CS 403.2	Demonstrate the concept on parallel and distributed database and its applications practically
CS 403.3	Build the applications of object oriented database
CS 403.4	Devise the common database administration tasks such as database monitoring, performance tuning, data transfer and security
CS 403.5	Analyze usage of advanced data models

CS404C Adhoc Wireless Networks	
CS404C.1	Understand basic concepts of Adhoc wireless networks.
CS404C.2	Identify different MAC protocols used for Adhoc wireless networks.
CS404C.3	Explain Different routing mechanisms in Adhoc wireless Network.
CS404C.4	Understand Forming multicast sessions in Adhoc wireless Network.
CS404C.5	Understand Modification in traditional TCP protocol for Adhoc Wireless Network.
CS404C.6	Analyze Security issues in Adhoc wireless Network and strategies to overcome these issues
CS404C.7	Compare different parameters for QoS in Adhoc wireless Network.

CS407 Data Analytics	
CS 407.1	Explain business intelligence & decision support system in Data




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CS 407.2	Demonstrate the mathematical models for decision making , Data mining & Data
CS 407.3	Select appropriate Big data & Hadoop Ecosystem.
CS 407.4	Estimate different data mining tasks with regression & association rule.
CS 407.5	Apply Association rule & clustering techniques in Big data
CS 407.6	Write application with R programming for manipulation & processing of data

CS408 Project Management

CS 408.1	Describe the project management principles and practices.
CS 408.2	Create and recognize project plan.
CS 408.3	Demonstrate Scope, Time and Cost management and its impact.
CS 408.4	Analyze software quality metrics and quality assurance.
CS 408.5	Calculate and categories the Human Resources
CS 408.6	Identify and evaluate risk factors involved in IT projects

CS409 Real-time Operating System

CS 409.1	Understand the design issue and examples of real time systems.
CS 409.2	Identify the hardware devices to develop real time applications.
CS 409.3	Understand the scheduling methods, synchronization & real time memory management concepts.
CS 409.4	Analyze the various types of requirements and programming languages used to develop the real time systems.




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CS 409.5	Differentiate between various types of metrics and calculate the cost requirements to develop real time applications.
CS 409.6	Apply the scheduling models, memory management techniques for commercial real time systems.

CS410A Internet of Things	
CS410A.1	Explain building blocks of IoT and its characteristics.
CS410A.2	Explain RFID and wireless sensor network technology
CS410A.3	Identify technology and standard relating to IoT.
CS410A.4	Identify need of governance of the IoT.
CS410A.5	Explain different IoT applications.

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ESC110 Fundamentals of Electronics and Computer	
ESC110.1	Students understand construction, biasing, V-I characteristics and application of Diode and BJT.
ESC110.2	Students understand basics of Digital Electronics.
ESC110.3	Students understand basic applications of Transducers and appliances
ESC110.4	Acquire the essential knowledge of computer system & peripherals.
ESC110.5	Understand operating system features and practice application software.
ESC110.6	Demonstrate use of computer networks and Internet.



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ET201 Engineering Mathematics-III	
ET201.1	An ability to identify, formulates, and solves Linear differential equation with constant coefficient
ET201.2	Understand application of Linear differential equation with constant coefficient which are related to Electrical engineering Systems.
ET201.3	Find the solution by Z-Transform.
ET201.4	Understand basic of inverse Laplace transform, Periodic & Heaviside function.
ET201.5	Knowledge of periodic function, Euler formulae, Fourier series and their different possible forms
ET202 Electronic Circuit Design-I	
ET202.1	Analyze and design electronic circuits such as rectifiers & unregulated power supply.
ET202.2	Analyze and design electronic circuits such as regulated power supply.
ET202.3	Analyze & Design of BJT & FET Biasing.
ET202.4	Explain the hybrid model of transistor and analyze the transistor amplifier (CE, CB, CC) using h-parameters
ET202.5	Analysis of CE Amplifier for low frequency & High frequency response for sinusoidal & square wave input.
ET202.6	Explain frequency response of single stage RC coupled amplifier. Also explain construction, working & characteristics of JFET & MOSFET.
ET203 Network Analysis	


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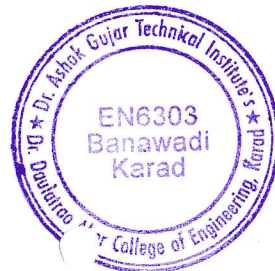
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Course Outcomes

ET203.1	Analyze the basic of AC and DC circuits using KCL, KVL and network Theorems.
ET203.2	Determine the voltages, currents, power and impedances at various nodes and loops using all simplification techniques.
ET203.3	Understand, identify and analyze the series, parallel resonance circuits, calculate the bandwidth, selectivity factor also.
ET203.4	Understand, analyze and design prototype LC filters.
ET203.5	Characterize and model the network in terms of all network parameters and analyze.
ET203.6	Formulate and solve the differential equation for RL, RC, and RLC circuits and carry out transient analysis.
ET204 Transducers and Measurement	
ET204.1	Explain principle of operation of different sensors & transducers and will be able to use it for measurement of digital parameters
ET204.2	Describe signal conditioning & data acquisition system.
ET204.3	Demonstrate testing & measuring instruments
ET204.4	Compare various display devices for appropriate application
ET204.5	Differentiate bridges according to their use
ET205 Analog Communication	
ET205.1	Understand and identify the fundamental concepts and various components of analog communication systems.
ET205.2	Understand, analyze and explain various analog modulation schemes.


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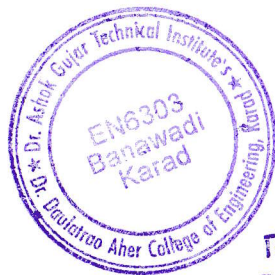
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ET205.3	Understand the performance of analog communications systems under the presence of noise.
ET205.4	Develop the ability to compare and contrast the strengths and weaknesses of various communication systems
ET205.5	Analyze Basic communications systems and their performance under the presence of noise
ET205.6	Differentiate between various pulse modulation techniques.
ET206 Programming Lab-I	
ET206.1	Student will be able to understand the basic concepts of procedure oriented programming language.
ET206.2	Student will be able to implement the control statements, looping statements and functions concepts.
ET206.3	Student will be able to design programs using user defined functions and data type
ET206.4	Student will be able to design & apply the skills for solving the engineering problems.
ET206.5	Students will be able to understand the concept string & relevant operations on it.
ET206.6	Students will be able to understand the concept of file & relevant operations on it.
ET206.7	Understand the basic programming concepts




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ET207 Electronic Circuit Design-II	
ET207.1	Analyze & Design Multistage and Feedback Amplifier
ET207.2	Analyze & Design Power Amplifier
ET207.3	Describe & Design Different types of Oscillators using BJT
ET207.4	Describe & Design Different types of Multivibrator using BJT
ET207.5	Describe & Design IC voltage Regulators
ET208 Linear Integrated Circuits	
ET208.1	Explain operational amplifier with its parameters
ET208.2	Classify different configuration of op-amp
ET208.3	Identify and explain different applications of op-amp
ET208.4	Design and implement various filters
ET208.5	Analyze different waveform generator circuits
ET208.6	Apply knowledge of op-amp in various industrial applications
ET209 Control System Engineering	
ET209.1	Compute overall transfer function of system using Block diagram reduction and signal flow graph technique.
ET209.2	Understand and analyze time response and steady state errors of first and second order control systems for different standard test


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	signals.
ET209.3	Explain stability of control system and apply different techniques to determine stability.
ET209.4	Plot frequency domain response for control system using bode plot and Nyquist stability criterion and determine stability.
ET209.5	Identify the needs of different types of controllers and compensator to ascertain the required dynamic response from the system
ET209.6	Formulate and analyze state model for given system
ET211 Digital Communication	
ET211.1	Realize and solve the problems related to random signals and also the related issues like power spectral density.
ET211.2	Work with the information availability and code the information in different formats.
ET211.3	Acquire knowledge of different source coding techniques available with their pros and cons.
ET211.4	Understand the baseband transmission with optical receiver operation and working.
ET211.5	Describe the channel coding techniques with error handling methods.
ET210 Data Structure	
ET210.1	Elaborate the basic concept of data structure & its types
ET210.2	Design and Implement the various algorithms on arrays & records

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ET210.3	Implement algorithms on linked list
ET210.4	Understand the concept of stacks, queues & its applications.
ET210.5	Construct various types of trees & their applications
ET212 Programming Lab-I	
ET212.1	Understand the basic concepts of procedure oriented programming language.
ET212.2	Identify the function and operator overloading concepts.
ET212.3	Understand and implement the concept of inheritance, template and exception handling applications.
ET212.4	Identify the concept of inheritance, virtual functions, dynamic binding & polymorphism.
ET212.5	Identify the types of inheritance & its design for code reuse in C++.

ET301 Antenna Wave Propagation	
ET301.1	Understand the importance of basics of antenna systems to differentiate the applicability of each type of antenna.
ET301.2	Analyze and characterize the utilization of Antenna systems in wide areas like wireless communication, fixed line communication, computer communication etc.
ET301.3	Solve various problems on various parameters of antennas.
ET301.4	Explain radiation and explain the effect of ground on electromagnetic waves propagation. Explain different modes of wave propagations.


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ET301.5	Explain properties of Ionospheric layer used for electromagnetic wave propagation , also explain fundamentals of RADAR system.
ET302 Control Systems	
ET302.1	Compute overall transfer function of system using Block diagram reduction and signal flow graph technique.
ET302.2	Understand and analyze time response and steady state errors of first and second order control systems for different standard test signals.
ET302.3	Explain stability of control system and apply different techniques to determine stability.
ET302.4	Plot frequency domain response for control system using bode plot and Nyquist stability criterion and determine stability.
ET302.5	Identify the needs of different types of controllers and compensator to ascertain the required dynamic response from the system
ET302.6	Formulate and analyze state model for given system
ET303 Signals and Systems	
ET303.1	Define CT signals mathematically & solve problems related to operations on signals.
ET303.2	Classify different systems & learn its properties.
ET303.3	Understand Fourier series & Transforms and represent different signals using these techniques.


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ET303.4	Apply different tools like Z-transform, Fourier Transform to analyze the systems.
	ET304 Power Electronics
ET304.1	Understand power electronics DC Drives, devices and its firing circuits.
ET304.2	Aware with Thyristors and allied applications, design and simulate Controlled rectifier circuits
ET304.3	Analyze the allied applications of Power Electronics.
ET304.4	Describe the PLC/SCADA and other miscellaneous applications.
	ET305 Digital Communication
ET305.1	Solve Problems on Probability.
ET305.2	Use information theory in communication System.
ET305.3	Explain Various Source coding techniques.
ET305.4	Explain baseband transmission and band pass modulation techniques.


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ET305.5	Understand Knowledge of Channel coding techniques with error detection and correction.
ET306 Simulation Lab	
ET306.1	Use the different commands, functions required for programming in MATLAB
ET306.2	Calculate and perform various operations using MATLAB.
ET306.3	Analyze and simulate the various systems.
ET307 Digital Signal Processing	
ET307.1	Apply DFT as an analytical tool
ET307.2	Analyze LTI Systems using FFT algorithms
ET307.3	Design FIR and IIR systems
ET307.4	Construct FIR and IIR Systems
ET307.5	Explain architecture of DSP Processors


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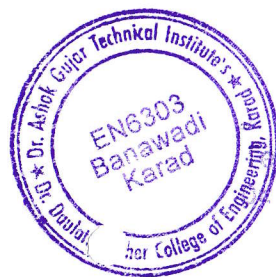
DACOE/ACADM/COF-FRM-


COF-FRM - Rev. No: 0 Date:

Course Outcomes

ET307.6	Differentiate between General Purpose and DSP Processors
	ET308 VLSI Design
ET308.1	Implement & Demonstrate HDL codes of digital designs using FPGA/ CPLD based technology.
ET308.2	Explain the difference between VHDL and Verilog HDL.
ET308.3	Model combinational circuits like Adder, Subtractor, Decoder, encoder, multiplexer, parity generator, Parity checker, comparator using different styles of modeling in VHDL&/or Verilog and implement in FPGA/ CPLD using suitable EDA tool.
ET308.4	Construct FSM, Model sequential logic circuits like counter & sequence detector and simulate it for functional verification.
ET308.5	Describe the features & internal architectures of CPLD (XC 9572) & Spartan III E FPGA (XC3S500E).
	ET309 Microprocessors and Microcontrollers
ET309.1	Explain the architecture of 8085 & write programs in assembly language for 8085.
ET309.2	Demonstrate interfacing of RAM,ROM, 8255, ADC, DAC, Keyboard, 7-seg display, stepper motor to 8085.


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Program: **Electronics and Telecommunication Engineering**

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Course Outcomes

ET309.3	Explain architecture of 8051 & write programs in assembly language for 8051.
ET309.4	Explain on chip hardware features like I/O ports, Timers, Interrupts, Serial communication.
ET309.5	Demonstrate Interfacing of RAM, ROM and peripherals like ADC, DAC, LCD, LM 35, stepper motor with 8051.
ET309.6	Write Embedded C program for 8051.
ET310 Optical Communication and Network	
ET310.1	Elaborate the basic optical communication along with the simulation and modeling tools.
ET310.2	Differentiate the different types of optical fiber structures and light propagating mechanisms.
ET310.3	Acquire knowledge of signal degradation mechanism in optical fiber.
ET310.4	Understand the construction of and working of optical sources and detectors.
ET310.5	Describe the optical receiver operation, WDM and optical network in detail.
ET311 Industrial Management	


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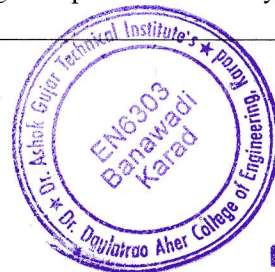
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COF-FRM - Rev. No: 0 Date:

Course Outcomes

ET311.1	Demonstrate that how a person is get selected in a company, how the performance of employee is evaluated.
ET311.2	Analyse the methods of performance appraisal and find the best out of them.
ET311.3	Define both marketing and selling concept.
ET311.4	Understand the techniques used for selling the product.
ET312 Electronic System Design	
ET312.1	Understand and design simple electronics systems
ET312.2	Apply the knowledge of sensors in designing different electronics systems.
ET312.3	Perform and design electronics systems based on microcontrollers.
ET312.4	Use these skills to implement mini projects.
ET312.5	Understand and design simple electronics systems.




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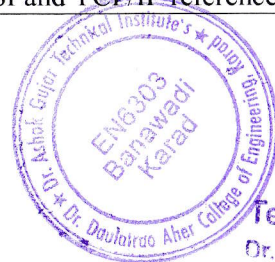
COF-FRM - Rev. No: 0 Date:


Course Outcomes

ET401 Satellite Communication	
ET401.1	Identify Orbital aspects involved in satellite communication
ET401.2	Formulate Power budget calculation
ET401.3	State Satellite system and services provided
ET401.4	Analyze the performance of satellite communication system
ET402 Embedded Systems	
ET402.1	Define embedded systems and state its characteristics
ET402.2	Describe the Architecture of PIC and ARM core
ET402.3	Build programs in assembly language for ARM core
ET402.4	Apply knowledge of PIC and ARM to develop embedded system designs
ET402.5	Explain concepts of RTOS
ET403 Computer Communication Networks	
ET403.1	Describe and differentiate types of networks such as LAN, WAN, MAN and network topologies like star, bus, ring etc. Explain and distinguish between OSI and TCP/IP reference model.


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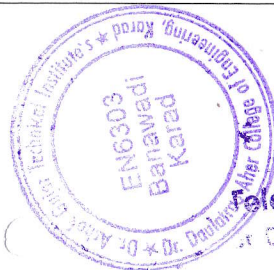
Course Outcomes

ET403.2	Summarizes guided & unguided transmission media and different networking devices used at physical layer.
ET403.3	Explain error detection & correction mechanisms and frame formats at data link layer.
ET403.4	Explain various routing algorithms like shortest path, distance vector, link state etc and congestion control algorithms viz. leaky bucket, token bucket used at network layer.
ET403.5	Illustrate different TCP/IP protocols like IP, ARP, RARP, TCP, UDP etc.
ET403.6	Demonstrate the network Security Mechanisms.

	ET404 RF & Microwave Engineering
ET404.1	Explain the different types modes propagation in waveguides
ET404.2	Select the appropriate component for various applications.
ET404.3	Measure the various microwave parameters.
ET404.4	Explain the different microwave Hazards.
ET404.5	Demonstrate the application of Microwave Engineering to various field
	ET405 Elective-I (ET405A Robotics)
ET405A .1	Student can understand basics concept of industrial atomization & Robotic technology

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Course Outcomes

ET 405A. 2	Students can able to select different sensors, electronics systems for Robot
ET 405A .3	Student can develop software for particular robotic applications
ET 405A. 4	Students will understand robot applications & develop robot for particular applications

ET408 Video Engineering	
ET408.1	Identify picture and sound transmission and reception.
ET408.2	Interpret color composite video signal.
ET408.3	Describe principle of digital TV system.
ET408.4	Demonstrate high definition television system.
ET408.5	Initiate advanced TV system like LCD, plasma, LED, CCTV, etc.
ET409 Digital Image Processing	
ET409.1	To state the fundamental steps involved in Digital Image Processing.
ET409.2	Select the appropriate image transforms and filtering techniques on an image.


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Course Outcomes

ET409.3	Apply and analyze image enhancement techniques.
ET409.4	Demonstrate an application based on image processing.
ET409.5	Perform operations on color image processing.

ET410 Wireless and Mobile Communication

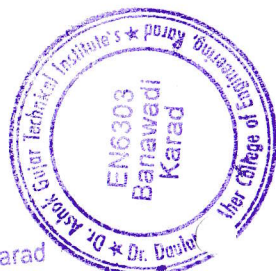
ET410.1	List basic fundamentals of wireless communication
ET410.2	Analyze large & small scale radio wave propagation
ET410.3	Apply multiple access techniques to mobile communication.
ET410.4	Create mobile network.


ET411 Elective-II (ET411C-Remote Sensing and GPS)

ET411C.1	Explain concepts, methodologies and applications of Remote Sensing Technology.
ET411C.2	Build the candidates for National and Global Employability
ET411C.3	Adapt skills in handling instruments, tools, techniques and modeling while using Remote Sensing Technology


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COF-FRM - Rev. No: 0 Date:

Course Outcomes

ET4111C.4

Build the candidate with confidence and leadership qualities

Prepared By :

Ms. S. M. Patil

Checked By:

Mr. P. J. Chorage (HOD , ETC)

Approved By :

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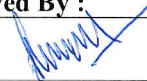
Program: **Electronics and Telecommunication Engineering**

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COF-FRM - Rev. No: 0 Date:

Course Outcomes

ET4111C.4	Build the candidate with confidence and leadership qualities
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Prepared By : Ms. S. M. Patil 	Checked By: Mr. P. J. Chorage (HOD , ETC) 	Approved By : 
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S.Y.B.Tech Mechanical

Sem - III

ENGINEERING MATHEMATICS-III

Course Outcomes:

Upon successful completion of this course, the student will be able to:

- 1) Solve Linear Differential Equations with constant coefficients.
- 2) Describe the statistical data numerically by using Lines of regression and Curve fittings.
- 3) Find Laplace transforms of given functions and use it to solve linear differential equations.
- 4) Apply knowledge of vector differentiation to find directional derivatives, curl and divergence of vector fields.
- 5) Develop Fourier series expansion of a function over the given interval.
- 6) Make use of Partial Differential Equation to solve the Mechanical Engineering problems.

ELECTRICAL TECHNOLOGY

Course Outcomes: At the end of this course, student will be able to

- 1) Deals the principles of Electrical Engineering
- 2) Understands the theoretical and practical's concepts of Electric motors
- 3) Apply Electrical heating methods for Industrial furnaces.
- 4) Identify and select suitable types of motors and drives
- 5) Decide complete Electrical drive system for Industrial applications.
- 6) Design various speed control techniques for Electric motors.

APPLIED THERMODYNAMICS

Course Outcomes: At the end of this course, student will be able to

1. Remember the fundamental laws of thermodynamics
2. Understand and Solve the introductory problems on Rankine cycle.
3. Classify steam generators and condensers and Steam turbines.
4. Design the steam nozzle.
5. Understand and Solve problems on Steam turbines.
6. Understand the property of lubricants and selection of lubricants.

METALLURGY

Course Outcomes: At the end of this course, student will be able to

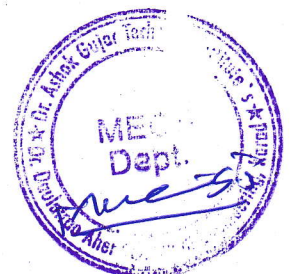
1. Understand basic concept of metal structure.
2. Understand fundamental knowledge of Ferrous and Non Ferrous Metal.
3. Selection of Metals and Alloys for different application.
4. Understand need of Heat treatment and various heat treatment processes.

FLUIDMECHANICS

Course Outcomes: At the end of this course, student will be able to


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1. Understand properties of fluids and classification of fluid flows
2. Identify the fluid flow problem and explain the theoretical concepts of fluid statics, fluid kinematics and fluid dynamics
3. Apply fundamental equation of fluid mechanics i.e. Continuity equation, Bernoulli's Equation and momentum equation for different fluid flow applications
4. Make basic analysis of laminar flow to calculate resistance to it through circular pipe and parallel plates
5. Calculate different losses in fluid flow through different arrangements of pipes
6. Apply theory of boundary layer, Drag and lift forces in proper cases

MACHINE DRAWING

Course Outcomes: At the end of this course, student will be able to

1. Use BIS conventions in machine drawings.
2. Find line/curve of intersection between two solids.
3. Sketch the various machine components.
4. Read and interpret the given production drawings.
5. Understand significance of assembly and detail drawings.

Computer Programming Using C++

Course Outcomes: At the end of this course, student will be able to

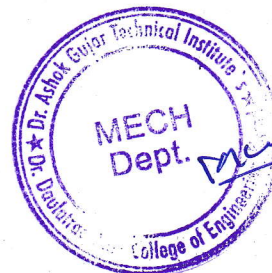
1. Write, compile and debug programs in C++ language.
2. Design programs involving decision control statements, loop control statements and case control structures.
3. Develop algorithms for solving problems using object oriented language.
4. Apply their knowledge and programming skills to solve various computing problems in the field of Mechanical Engineering.

WORKSHOP PRACTICE III

Course Outcomes: At the end of this course, student will be able to

1. Understand types of Patterns, Core boxes and Preparation of Pattern for solid casting.
2. Understand properties of sand by permeability test, moisture percentage test, and green Strength.
3. Understand gating system for metal casting with casting defects

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S.Y.B.Tech Mechanical

Sem – IV

APPLIED NUMERICAL METHODS

Course Outcomes:

1. Understand and apply various methods to find roots of equations.
2. Learn and Implement different methods to solve simultaneous equations.
3. Understand and apply the methods of Regression and interpolation.
4. Implement various numerical methods for differentiation and Integration.
5. Apply various methods to solve engineering problems with Ordinary differential equations.
6. Understand the methods to solve Partial differential equations involved in Engineering Problems.

ANALYSIS OF MECHANICAL ELEMENTS

Course Outcomes: At the end of this course, student will be able to

1. Apply concepts of analysis of mechanical elements to obtain solution to various types of loading and stresses induced in real time engineering problems.
2. Draw shear force and bending moment diagrams for simple beams subjected to various loads and support conditions.
3. Compute and analyze bending and shear stresses in mechanical components.
4. Determine plane stress, principal stress .maximum shear stress and their orientations using analytical method and Mohr's circle.
5. Analyze the effect of deflection in beams.
6. Evaluate buckling and strain energy in beams subject to various types of loading.

FLUID AND TURBO MACHINERY

Course Outcomes: At the successful completion of this course, student will be able to,

1. Classify and understand working principle of rotodynamic machines and Reciprocating compressor.
2. Remember Euler's equation of rotodynamic machines
3. Remember Euler's equation of rotodynamic machines
4. Apply the theoretical knowledge to solve numerical problems, select the machines for particular application.
5. Analyze the machines to evaluate the performance.

THEORY OF MACHINES-I

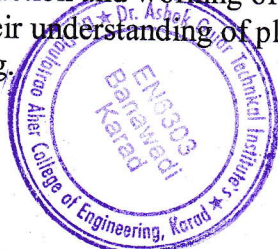
Course Outcomes: At the end of this course, student will be able to

1. Understand different types of mechanisms and their applications
2. Analyze kinematic theories of mechanism,
3. Design cam with follower for different applications
4. Select different power transmitting elements according to application
5. Select different governing mechanisms according to application.

MACHINE TOOLS AND PROCESSES

Course Outcomes: At the end of this course, student will be able to

1. Identify various kinds of machine tools of previous and present era tools.
2. Describe construction and working of basic machine tools.
3. Demonstrate their understanding of plastic processing, injection moulding, extrusion and thermoforming.



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4. Analyze the concept, mechanism of material removal with respect different processes.
5. In position to appreciate the merits of non-traditional machining and its applications in industries.

Testing and Measurement

Course Outcomes: At the end of this course, student will be able to

1. Understand basic construction of working of various instruments
2. Select the various of types of instruments for the measurement system

COMPUTER AIDED DRAFTING

Course Outcomes: At the end of this course, student will be able to

1. Draw 2D drawings and 3D models of simple components.
2. Analyze and interpret production Drawing
3. Use modern engineering techniques, tools and skills for engineering practice.
4. Develop the skills for drafting using CAD software and get the knowledge to enhance the CAD utilities.

Computer Graphics

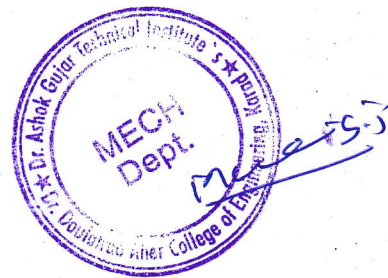
Course Learning Outcomes:

- 1) To acquire the knowledge of basics of computer graphics.
- 2) To Apply basic programming in C for line, rectangle, circle etc for different shapes.
- 3) To recognize the importance of using three dimensional transformations like translation, scaling and rotating.
- 4) To Analyzing the hidden unwanted parts in graphics and do the program on animation
- 5) To choose the different of curves and surfaces

WORKSHOP PRACTICE IV

Course Outcomes: At the end of this course, student will be able to

- 1) Understand Machine layout, method of Machine Tool installation, selection of Tools for various machining operation.
- 2) Understand Construction, Mechanism and Application of Lathe Machine, Drilling Machine, and Milling Machine.
- 3) Understand machining operations and prepare Job with plain turning, taper turning, external threading and knurling operation along with its process sheet
- 4) Understand basics of CNC and VMC Machine



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**T.Y.B.Tech Mechanical
Sem – V**

Control Engineering

Course Outcomes: At the end of this course, student will be able

1. To understand control system, its type and applications
2. To model physical system.
3. To determine system stability and system response.
4. To understand various control actions.
5. To use MATLAB software to analyze control system

Theory of Machines – II

Course Outcomes: At the end of this course, student will be able to

1. Identify the various types of gears.
2. Select a gear drive for practical purpose.
3. Analyze the gyroscopic effects for practical life.
4. Solve a balancing problem.
5. Do the balancing of practical devices to reduce vibration.
6. Do force analysis of mechanisms.

Heat & Mass Transfer

Course Outcomes: At the end of this course, student will be able to

1. Formulate basic equations for heat transfer problems.
2. Apply heat transfer principles to design and evaluate performance of thermal systems.
3. Calculate the effectiveness and rating of heat exchangers.
4. Calculate heat transfer by radiation between objects with simple geometries.
5. Calculate and evaluate the impact of boundary conditions on the solutions of heat transfer problems
6. Evaluate the relative contributions of different modes of heat transfer.

Machine Design-I

Course Outcomes: At the end of this course, student will be able to

1. Apply basic principles of machine design
2. Design machine elements on the basis of strength concept.
3. Use design data books and standard practices.
4. Select machine elements from Manufacturer's catalogue.

Manufacturing Engineering

Course Outcomes: At the end of this course, student will be able to

1. Understand various metal cutting technology including the process and measurement etc
2. Identify and select proper cutting tool with respect to work piece materials
3. Identify parameters of single and multipoint cutting tools.
4. Design and Draw Jig and Fixture.
5. Select and design dies for press working operations.
6. Understand and apply CNC Technology

Enterprise Resource Planning

Course Outcomes: At the end of this course, student will be able to



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1. Understand the structure of an ERP system and know how process chains in Materials management, production, controlling and sales are implemented in an ERP system
2. Implementation and customize an ERP system using the appropriate modeling methods that are Entity Relationship Modeling (ERM) and Event-Driven Process Chains (EPC)
3. Understand the customization of an ERP system and customize essential parts of materials management, production, controlling and sales in SAP ECC
4. Understand software design issues in state-of-the-art business software and realize The importance of project management in an ERP implementation project
5. Understand what to expect, and not to expect, from a consultant implementing an ERP system
6. Understand the importance of IT governance in long-term relationships with a software vendor such as SAP

CAD CAM Laboratory

Course Outcomes: At the end of this course, student will be able to:

1. Understand and read engineering Drawings.
2. Prepare solid and surface models from 2D drawings.
3. Prepare assemblies and BOM.
4. Conversion of 3D Models into orthographic views.
5. Know the process of CAD data exchange between the software.
6. Understand the basics of Computer Aided Manufacturing.

WORKSHOP PRACTICE – V

Course Outcomes: At the end of this course, student will be able to

1. Select the suitable machining operations and prepare process sheet to manufacture a Component and implement the same.
2. Control key dimensions on a component using principles of metrology and assembly.

T.Y.B.Tech Mechanical Sem – VI

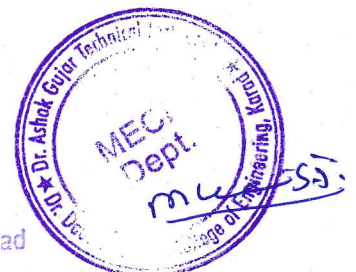
Industrial Management and Operations Research

Course Outcomes: At the end of this course, student will be able to

1. Apply the concepts of Industrial management and operations research approaches know various functional areas of management.
2. They will analyses issues in Managing operations and projects and various approaches to resolve those issues.
3. Formulate and solve a wide variety of applications and problems that can be addressed using Operations Research techniques as Linear programming problems.
4. Formulate and solve a wide variety of applications and problems that can be addressed using Operations Research techniques as Transportation and Assignment problems
5. Apply the various techniques of Project Management such as Network Model and Sequencing Model.



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Industrial Fluid Power

Course Outcomes: At the end of this course, student will be able to

1. Do analysis of performance of Hydraulic and pneumatic system
2. Demonstrate Hydraulic and pneumatic system
3. Apply Hydraulic and pneumatic system fundamentals to industrial applications
4. Demonstrate knowledge about the fundamentals of Hydraulic and pneumatic system

Metrology and Quality Control

Course Outcomes: At the end of this course, student will be able to

1. Identify and use various measuring instruments and select appropriate instrument for particular feature measurement.
2. Distinguish and understand quality assurance and quality control. They can use control charts and sampling plans to manufacturing and service sector problems.
3. Learn advanced techniques of metrology in various industrial applications.
4. Prepare and understand drawings with general dimensions, tolerances and surface finish.

Machine Design-II

Course Outcomes: At the end of this course, student will be able to

1. Design machine elements subjected to fluctuating loading
2. Understand effect of tribological considerations on design
3. Select rolling contact bearings from manufacturer's catalogue.
4. Design sliding contact bearings used in various mechanical systems
5. Design various types of gears such as spur, helical, bevel and worm gear

Internal Combustion Engines

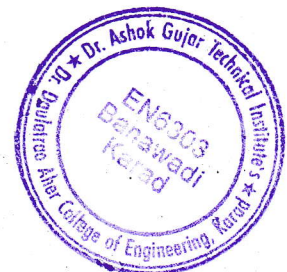
Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Demonstrate engine construction, function of various parts of the engine and classify I.C.Engines.
2. Demonstrate combustion mechanism.
3. Demonstrate importance and functions of various systems on the engine .
4. Demonstrate need and methods of engine testing.
5. Understand the impact of vehicular pollution and ways to reduce or control the pollution.

Computer Aided Design and Manufacturing

Course Outcomes: At the end of this course, student will be able

1. To Compare and Represent 2-D and 3-D entities
2. To Apply transform techniques on 2-D and 3-D entities
3. To Examine CNC program for production of components
4. To Express the principles and methods of Rapid Prototyping



Computer Integrated Manufacturing

Course Outcomes: At the end of this course, student will be able to

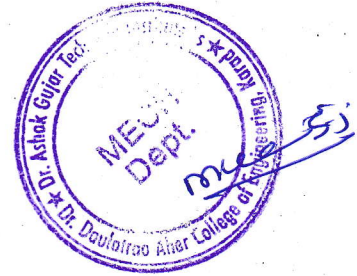
1. Locate modern techniques for integrating CAD/CIM in CIM
2. Obtain an overview of computer technology in Production Planning and Control including Computers
3. Apply classification and coding in Group Technology.
4. Elaborate Computer Aided Production Planning and Control.
5. Generate CNC lathe part programming for turning ,facing,stepturning,taper turning



Workshop Practice-VI

Course Outcomes: At the end of this course, student will be able to

1. Select the suitable machining operations and prepare process sheet to manufacture a Components and implement the same.
2. Control key dimensions on a component using principles of metrology and assembly



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**FINAL YEAR B.TECH
SEMESTER VII**

REFRIGERATION AND AIR CONDITIONING

Course Outcomes: Upon successful completion of this course, the student will be able to

1. Demonstrate an understanding of the need and importance of HVAC technology, the typical and some advanced and innovative schematic designs, and the goals of HVAC engineering and HVAC systems.
2. Demonstrate an understanding thermal comfort conditions with respect to temperature and humidity and human clothing and activities and its impact on human comfort, productivity and health.
3. Demonstrate an understanding of psychometrics and its application in HVAC engineering and design and will practice or observe psychometric measurements.
4. Demonstrate an understanding of heat transfer in buildings with a given architectural design and its application to heating and cooling load estimation especially including thermal lag effects by conducting a detailed annual load analysis for a representative building and present the results of this analysis in a formal report possibly including recommendations for energy conservation.
5. Demonstrate an understanding of the engineering and operation of vapour compression and possibly heat-driven refrigeration systems and evaporative cooling systems and understand contemporary issues of ozone depletion and global warming potential with respect to refrigeration systems.

MECHANICAL SYSTEM DESIGN

Course Outcomes: On completion of the course, students will be able to

1. Understand the role of aesthetics, ergonomics and creativity in design.
2. Understand theories and principles used in design of pressure vessels, IC Engine and material handling equipments.
3. Analyze and select suitable materials and design parameters during the design of pressure vessels, IC engine components, machine tool gear box and material handling systems as per industrial and societal requirement.
4. Evaluate the load carrying capacity, stress bearing capacity in various mechanical systems like unfired pressure vessels, IC engine components.
5. Design various mechanical systems like pressure vessels, machine tool gear boxes, material handling systems, etc. as per industrial and societal requirement.
6. Create the competency in mechanical system design by applying industrial design aspect

FINITE ELEMENT ANALYSIS

Course Outcomes: On completion of the course, students will be able to

1. Elaborate the fundamental concepts of Finite Element method.
2. Understand the key concepts like Shape function, element stiffness and boundary conditions by finite element formulations for 1D problem.
3. Apply the finite element formulations for two dimensional problems using constant strain triangle.



4. Demonstrate the modeling aspects of axisymmetric solids subjected to axisymmetric loading.
5. Apply the finite element formulations for Planer Trusses using 1D element.
6. Solve Scalar field problems by Finite element formulation.

AUTOMOBILE ENGINEERING

Course Outcomes: On completion of the course, students will be able to

1. Explain components of automobile.
2. Distinguish various types of automobile lay outs as per drive given to wheels.
3. Identify types of automobile bodies and materials used for the same.
4. Demonstrate various automobile systems like clutch, gearbox final drive, brake, steering suspension wheels and Tyres, and its construction and working.
5. Demonstrate various electrical and electronic systems like lighting, starting charging electronic controlled management system and its construction and working principle, sensors used in automobile
6. Solve the problems related with various resistances for the automobile, engine power calculation.
7. Explain modern trends, techniques used in industries.

TOTAL QUALITY MANAGEMENT (ELECTIVE-II)

Course Outcomes: On completion of the course, students will be able to

1. Understand the concepts of total quality and quality assurance approaches.
2. They will identify and solve issues in quality related problems in manufacturing or service sector at various stages by using various TQM tools and techniques,
3. Understand vendor rating and select suitable vendor
4. Interpret various quality attributes and discuss the various quality approaches.
5. Calculate reliability of system
6. They will identify and solve issues in industries using the various techniques of TQM such as 5S, JIT, TPM, Reliability Engineering, Quality Circle etc.

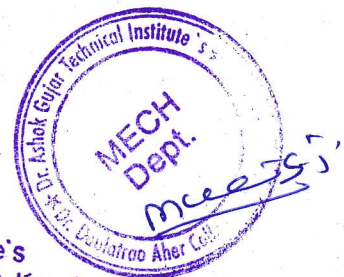
SEMINAR

Course Outcomes:- Upon successful completion of this course, the student will be able to

1. Have and develop presentation skills.
2. Impart knowledge in different aspects of knowledge domains.
3. Make them aware of knowledge in industry perspective and new industry trends.
4. Build confidence and improve communication skills.
5. Collect ideas through literature survey about new innovations, analyze and present them.
6. Sharpen their personality and intelligence.



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SUMMER INTERNSHIP

Course Outcomes: Upon successful completion of this course, the student will be able to

1. Comprehend the knowledge gained in the coursework
2. Create, select, learn and apply appropriate techniques, resources, and modern engineering tools.

PROJECT PHASE-I

Course Outcomes:- Upon successful completion of this course, the student will be able to

1. Improve the professional competency and research aptitude in relevant area.
2. Develop the work practice in students to apply theoretical and practical tools/techniques to solve real life problems related to industry and current research.

FINAL YEAR B.TECH SEMESTER VIII

MECHATRONICS

Course Outcomes: At the end of this course, student will be able to

- 1 Develop a simulation model for simple physical systems and explain Mechatronics design process.
- 2 Outline appropriate sensors and actuators for an engineering application
- 3 Write simple PLC programs
- 4 Explain various applications of design of Mechatronic systems

ENERGY AND POWER ENGINEERING

Course Outcomes: At the end of this course, student will be able to

1. Analyze the utilization of solar, wind energetic.
2. Demonstrate need of different energy sources and their importance.
3. Illustrate power plant economics.
4. Comprehend various equipment's /systems utilized in power plants

NOISE AND VIBRATIONS

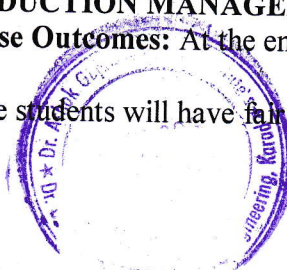
Course Outcomes: At the end of this course, student will be able to

1. Understand relevance of noise in mechanical systems.
2. Carry out measurement of various vibration parameters.
3. Analyze vibratory response of mechanical element/system.
4. Estimate natural frequency of mechanical element/system.
5. Develop mathematical model to represent dynamic system

PRODUCTION MANAGEMENT

Course Outcomes: At the end of this course, student will be able to

1. The students will have fair understanding of the role of Production / Operations



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Management played in business processes.

2. Emphasis on both familiarization of various production processes and service systems and quantitative analysis of problems arising in the management of operations

ENTERPRISE RESOURCE PLANNING

Course Outcomes: At the end of this course, student will be able to

- 1 Understand the structure of an ERP system and know how process chains in materials management, production, controlling and sales are implemented in an ERP system Implementation and customize an ERP system using the appropriate modeling Methods, that are Entity Relationship Modeling (ERM) and Event-Driven Process
- 2 Chains (EPC)
- 3 Understand the customization of an ERP system and customize essential parts of materials management, production, controlling and sales in SAP ECC
- 4 Understand software design issues in state-of-the-art business software and realize the importance of project management in an ERP implementation project
- 5 Understand what to expect, and not to expect, from a consultant implementing an ERP system
- 6 Understand the importance of IT governance in long-term relationships with a software vendor, such as SAP

PROJECT PHASE-II

Course Outcomes: At the end of this course, student will be able to

1. Improve the professional competency and research aptitude in relevant area.
2. Develop the work practice in students to apply theoretical and practical tools/techniques to solve real life problems related to industry and current research.




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