

SIES Graduate School of Technology
Department of Information Technology (IT)
Course Outcomes (CBGS)
Second Year: Sem III

Subject: APPLIED MATHEMATICS - III

- Obtain the Laplace Transform and Inverse Laplace transform using standard results and properties.
- ITC301.1 Solve ODE using LT.
- ITC301.2 Perform calculation with operators Gradient, Divergence and Curl.
- ITC301.3 Find the harmonic conjugate, orthogonal trajectory of an analytic function
- Expand the periodic function using Fourier series and complex form of Fourier series, understand
- ITC301.4 the concept of half range sine and cosine series.
- ITC301.5 Find the Z transform of standard sequences
- ITC301.6 Apply the procedure and methods to solve technical problems.

Subject: Data structures and algorithms

- Choose appropriate data structure as applied to specified problem definition and analysis the
- ITC301.1 algorithm.
- Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data
- ITC301.2 structures and algorithm analysis.
- ITC301.3 Apply concepts learned in various domains like DBMS, compiler construction etc.
- ITC301.4 Use linear and non-linear data structures like stacks, queues, linked list etc.
- ITC301.5 Design advance data structure using Non-Linear data structure.
- ITC301.6 Determine and analyze the complexity of given Algorithms.

Subject: Object Oriented Programming Methodology

- ITC302.1 Solve computational problems using basic constructs like if-else, Control structures, array, strings.
- ITC302.2 Explain how to model real world scenario using class diagram.
- ITC302.3 Exhibit communication between two objects using sequence diagram.
- ITC302.4 Implement relationships between classes.
- ITC302.5 Demonstrate various collection classes.
- ITC302.6 Demonstrate programs on exceptions, multithreading and applets.

Subject: Analog and Digital Circuits

- ITC304.1 The student will be able to use various electronic components
- ITC304.2 The student will be able to design stable analog circuits and do circuit simulation
- ITC304.3 The student will be able to design combinational and sequential circuits.
- ITC304.4 Student will be able to do binary and hexadecimal calculations and conversions.

- ITC304.5 The student will be able to translate real world problems into digital logic formulations.
The student will be able to design digital systems like VHDL and concepts of Microprocessor and
ITC304.6 Microcontroller systems.

Subject: Database Management system

- ITC305.1 Use SQL- the standard language of relational database for database management.
ITC305.2 Analyze the functional dependencies and perform normalization.
ITC305.3 Design the database schema for the given problem statement.
ITC305.4 Explain the concept of concurrency and transaction processing.
ITC305.5 Write relational algebra expression and its equivalent SQL queries.
ITC305.6 Describe the concept of query processing and query optimization.

Subject: Principles of Analog and Digital Communication

- ITC306.1 Students will be able to analyze Analog and Digital Communication systems.
ITC306.2 Students will be able to apply basic mathematics, science to solve engineering problems in Noise and Fourier transforms.
ITC306.3 Students will be able to design Transmitters and Receivers of Communication systems.
ITC306.4 Students will be able to have an exposure on pulse modulation systems and digital modulation techniques.
ITC306.5 Students will be able to explain line coding techniques and multiplexing techniques.
ITC306.6 Students will be able to explain band pass modulation, digital carrier modulation and demodulation techniques.

Second Year: Sem IV

Subject: Applied Mathematic IV

- ITC401.1 Find Eigen values and eigenvectors of a matrix to diagonalizable the Square matrix
- ITC401.2 Evaluate integral using Cauchys theorem, residue theorem.
- ITC401.3 Use Binomial, Poisson and Normal distribution to solve statistical problems
- ITC401.4 To analyze the problem by using Large and Small Sampling theory.
- ITC401.5 Find the regression lines using method of least squares and correlation coefficients.
- ITC401.6 Optimize the solution of LPP and NLPP

Subject: Computer Networks

ITC402.1 Student will be able to describe different LAN topologies, design issues and functions of each layer in OSI and TCP/IP model.

ITC402.2 Student will be able to analyze the physical layer , data link layer concepts, design issues, and protocols.

ITC402.3 Student will be able to gain core knowledge of network layer routing protocols and ip addressing.

ITC402.4 Student will be able to explain transport layer and its services and protocols.

ITC402.5 Students will be able to compare the Networking using Windows and Linux Operating systems and design the network using modern tools.

ITC402.6 Students will be able to demonstrate network protocols and analyze the traffic in network.

Subject: Computer Organization & Architecture

ITC403.1 Students will be able to describe basic organization and architecture of Computer system.

ITC403.2 Students will be able to solve the integer and floating point computer arithmetic

ITC403.3 Students will be able to demonstrate control unit operations.

ITC403.4 Students will be able to categorize memory organization and explain the function of each element of a memory hierarchy.

ITC403.5 Students will be able to identify and compare different methods for computer I/O mechanism.

ITC403.6 Students will be able to demonstrate analyses instruction level parallelism.

ITC403.3 Students will be able to describe basic organization and architecture of Computer system.

Subject: Automata Theory

ITC404.1 Student should be able to Design different types of machines.

- ITC404.2 Student should be able to Compare different types of languages and machines
Student should be able to Use the pumping lemma and closure properties to prove that some problems cannot be solved
- ITC404.3 by particular machines.
- ITC404.4 Student will be able to explain Power and Limitations of theoretical models of Computation..
- ITC404.5 Student should be able to Match constraints of a language to power of machines.

- ITC404.6 Student will be able to apply different machines in parsing and other applications

Subject: Web Programming

- ITC405.1 Creation of web site considering both client- and server-side programming.
- ITC405.2 Knowledge of tools and techniques to create web site.
- ITC405.3 Understand basics of web development and web architecture
design of experiments, analysis and interpretation of data and synthesis of information to provide
- ITC405.4 valid conclusions
- ITC405.5 Design documentation, make effective presentations, give, and receive clear instructions.
Apply ethical principles and commit to professional ethics and responsibilities and norms of
- ITC405.6 engineering practice.

Subject: Information Theory and coding

- ITC406.1 To explain true meaning of information and theory and are able to solve engineering problems.
- ITC406.2 Students will be able to understand concept of compression.
- ITC406.3 Students will be able to explain the meaning of error control and security
- ITC406.4 Students will be able to apply knowledge of mathematics in cryptography
- ITC406.5 Students will be able to use techniques, skills necessary for compression.
- ITC406.6 Students will be able to implement an application on real life dataset as group activity

Third Year: Sem V

Subject: Computer Graphics and Virtual Reality

- ITC501.1 CO1 Identify and demonstrate display primitives: point, line, circle and curves.
- ITC501.2 CO2 Demonstrate clip portion that are not of immediate interest.
- ITC501.3 CO3 Represent two dimensional objects and projection.
- ITC501.4 CO4 Represent three-dimensional objects and projection.
- ITC501.5 CO5 Illustrate the fundamentals of animations and virtual reality.
- ITC501.6 CO6 Illustrate the various technologies and modeling techniques used in Virtual Reality.

Subject: operating system

- ITC502.1 Student will able to explain important computer system resources and their management policies, algorithms used by operating systems.
- ITC502.2 Student will analyzed computer system function and the primary pc components.
- ITC502.3 Student will analyzed the working of an Operating System as a manager of various resources.
- ITC502.4 Student will implement some of the functions of os such as scheduling policies, page replacement algorithms, ipc.
- ITC502.5 Student will explain the file organization and file sharing in operating system.
- ITC502.6 Student will apply various concept related with deadlock to solve problems related with resources allocation after checking system in safe state or not.

Subject: Microcontroller & Embedded Systems

- ITC503.1 Students will be able to analyse conceptual embedded system for a given purpose
- ITC503.2 Students will be able to describe features and architecture of microcontroller 8051 and ARM7 processor
- ITC503.3 Students will be able to demonstrate assembly and Embedded Programming skills for microcontroller 8051 and microprocesso ARM7 with the help of hardware boards and suiatble tools.
- ITC503.4 Students will be able to Demonstare the fundamentals of Real-Time Operating System.
- ITC503.5 Students will be able to analyse various case stduies of embedded application and identify various design issues.
- ITC503.6 students will be able to interface peripheral devices with 8051 microcontroller

Subject: Advanced Database Management Systems

- Student should be able to Construct complex queries using SQL to retrieve and manipulate information in databases
- ITC504.1
- Student should be able to design and implement full-fledged real life applications integrated with database systems
- ITC504.2
- Student should Clearly explain how databases are actually stored and accessed;How transaction ACID properties are maintained and how a database recovers from failures
- ITC504.3
- Student should Apply security controls to avoid any type of security incidents on vital database systems
- ITC504.4
- Student should be able to design solution by identifying appropriate data structure to solve a problem. (SO-e)
- ITC504.5
- Students will be able to explain the importance of enterprise data and be able to organize data to perform analysis on the data and take strategic decisions
- ITC504.6

Subject: Open Source Technologies

- ITC502.1 Install Linux in a Multiboot Environment and Use of basic Linux commands
- ITC502.2 Install Web Server , FTP server on Linux
- ITC502.3 Securing Servers with firewall
- ITC502.4 Perform Shell Programming
- ITC502.5 Design Interface for Android App
- ITC502.6 Performing hands on on various open source tools

Subject: Business Communication and Ethics

- ITC506.1 Student should be able to write a technical report in specific format.
- ITC506.2 Student should be able to write a technical proposal in specific format.
- ITC506.3 Student should be able to apply interpersonal skills effectively and enhance communication
- ITC506.4 Student should be able to prepare the notice, agenda and minutes of a formal meeting.
Student should be able to understand the importance of ethics and apply it for their career advancement.
- ITC506.5 Student should be able to understand employment skills and prepare a resume along with the skills required to face an interview.
- ITC506.6

Third Year: Sem VI

Subject: Software Engineering

- Student will be able to meet the Information Technology Program Objectives of identifying and solving engineering problems
- ITC601.1
- Student will be able to Explain principles, concepts, methods, and techniques of the software engineering approach to produce quality software for large, complex systems.
- ITC601.2
- Student will be able to function effectively as a member of a team engaged in technical work.
- ITC601.3
- Student will be able to think critically about ethical and social issues in software engineering for different applications.
- ITC601.4
- Student will be able to study and compare different testing tools
- ITC601.5
- Student will be learn how to communicate with project leader and team member.
- ITC601.6

Subject: Distributed Systems

- CO1 students will be able to explain fundamental principles of Distributed Systems, along with design and implementation of key mechanisms, Clock Synchronization, along with design and implementation of key mechanisms, Clock Synchronization, Election Algorithms, Mutual Exclusion, Message Communication, Process and Resource Scheduling etc.
- ITC602.1
- CO2 students will be able to demonstrate the message communication, remote procedure call and Remote method invocation (RPC and RMI) along with group communication
- ITC602.2
- CO3 students will be able to identify applications using current distributed computing technologies like EJB, CORBA and .NET
- ITC602.3
- CO4 Student should be able to develop/design distributed system/applications for an enterprise using SOA
- ITC602.6
- students will be able to apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- ITC602.5
- students will be able to apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- ITC602.6

Subject: Software and Web Security

- ITC603.1 To understand the fundamentals of secret and public cryptography
- ITC603.1 Student will be able to explain fundamentals of secret and public cryptography
- ITC603.2 Student will be able to apply knowledge of mathematics, science, engineering fundamentals to develop a security model to prevent, detect and recover from attacks .
- ITC603.3 Student will be able to use different tools to understand the issues and give solutions to program and web security
- ITC603.6 Student will be able to apply ethical principles and commit to professional ethics and responsibilities as system security professional.
- ITC603.5 Students will be able to be describe network security designs using available secure solutions (such as PGP, SSL, IPsec, etc)

ITC603.6

Subject: Data Mining and Business Intelligence

- ITC606.1 Demonstrate an understanding of the importance of data mining and the principles of business intelligence
- ITC606.2 Able to prepare the data needed for data mining algorithms in terms of attributes and class inputs, training, validating, and testing files.
- ITC606.3 Implement the appropriate data mining methods like classification, clustering or association mining on large data sets.
- ITC606.6 Define and apply metrics to measure the performance of various data mining algorithms.
- ITC606.5 Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and Visualize the results
- ITC606.6 and provide decision support.

Subject: Advanced Internet Technology

- ITC605.1 Use the google Analytics for tracking their website.
- ITC605.2 Design Website using HTML5
- ITC605.3 Develop Keyword Generation Tool
- ITC605.4 To demonstrate Responsive Web Design
- ITC605.5 Design Website using CSS3
- ITC605.6 To demonstrate Amazon/Google or yahoo mashup

Fourth Year: Sem VII

Subject: Software Project Management

- ITC701.1 Articulate similarities and differences between IT projects and other types of projects.
- ITC701.2 Justify an IT project by establishing a business case, project charter
- ITC701.3 Construct and analyze network diagram.
- ITC701.4 Identify IT project risk and develop risk mitigation strategies.
- ITC701.5 Ensure the quality of the project using various standards.
- ITC701.6 Demonstrate team work and team spirit and how to overcome the conflicts.

Subject: Cloud Computing

- ITC702.1 Student will be able to compare different computing techniques.
- ITC702.2 Student will be able to differentiate various cloud computing providers/ Software.
- ITC702.3 Student will be able to demonstrate Open Source Cloud Implementation and Administration.
- ITC702.4 Student will be able to explain the process of adoption of cloud by SMBs and enterprises
- ITC702.5 Student will be able to explain risks involved in cloud computing.
- ITC702.6 Student will be able to describe authentication and authorization management in cloud

Subject: Intelligent system

- ITC703.1 Students will be able to solve different issues involved in trying to define and simulate intelligence.
- ITC703.2 students will be able to familiar with specific, well known Artificial Intelligence methods, algorithms and knowledge representation schemes
- ITC703.3 students will be able to study different techniques which will help them build simple intelligent systems based on AI/IA concepts
- ITC703.4 Students will be able to choose an appropriate problem-solving method and Knowledge-representation scheme.
- ITC703.5 Students will develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents.
- ITC703.6 Students will be able to develop simple intelligent systems using different AI techniques as group activity

Subject: Image Processing - Elective

- ITC7051.1 Define the fundamental concepts of a digital image processing system
Students should be able to explain the fundamental concepts of a digital image processing system
- ITC7051.2 Students should be able to make extensive use of these concepts in implementing processing techniques such as noise removal, enhancement
- ITC7051.3 Students should be able to learn compression for efficient storage and transmission

- ITC7051.4 Students should be able to use of segmentation techniques for object extraction
- ITC7051.5 Students should be able to implement of image representation and description for recognition or building computer vision
- ITC7051.6 Students should be able to implement image processing application
Make extensive use of these concepts in implementing processing techniques such as noise removal, enhancement

Subject: Wireless Technology

- ITC704.1 The students will be able to explain different modern wireless communication networks,
- ITC704.2 The students will be analyse the evolution of cellular networks.
The students will be able to compare basic framework of various protocols, standards used to develop
- ITC704.3 wireless personal and wide area networks.
The students will be able to analyze the characteristics and trends of mobile/wireless communication
- ITC704.4 channels.
The students will be able to compare the different multiple radio access techniques and multiuser
- ITC704.5 detection techniques.
- ITC704.6 The students will be able to analyze various wireless networks and their securities and economies
The students will be able to explain different modern wireless communication networks,

Subject: Project -A

- ITC706.1 Student should be able to carry out literature survey/visit industry/analyses current trends and identify and finalize the problem for project.
- ITC706.2 Student should be able to define the problem, which will relate theory with real time application for the benefit of society and environment.
- ITC706.3 To formulate the problem to certain domain Like Image Processing, machine learning, Data mining , networking using suitable tools.
- ITC706.4 Student should be able to clearly define objective and investigate the scope of identified problems
- ITC706.5 Student should be able to position their problem based on identification of gap based on literature survey.
- ITC706.6 Student should be able to work effectively as an individual or in a team by managing the finance, timeline and produce the documents.

Subject: E -Commerce & E-Business

- ITC7053.1 Define and differentiate various types of e-commerce.
- ITC7053.2 Describe hardware and software technologies for e-commerce.

- ITC7053.3 Explain payment systems for e-commerce.
- ITC7053.4 Describe the process of selling and marketing on web.
- ITC7053.5 Define and describe e-business and its models.
- ITC7053.6 Discuss various e-business strategies.

Fourth Year: Sem VIII

Subject: Storage Network Management and Retrieval

- ITC801.1 Evaluate storage architectures.
- ITC801.2 Evaluate storage subsystems, SAN, NAS, and IP-SAN,
- ITC801.3 Define Backup & Recovery
- ITC801.4 Examine emerging technologies including IP-SAN.
- ITC801.5 Define information retrieval in storage network
- ITC801.6 Identify different storage virtualization technologies.

Subject: Big Data Analytics

- ITC802.1 Students will be able to understand the key issues in big data management and its associated applications in intelligent
- ITC802.2 Students will be able to acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce
- ITC802.3 Students will be able to interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
- ITC802.8 Students will be able to achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.
- ITC802.5 Students will be able to analyze datasets by using different tools available such as R, weka.
- ITC802.8 Students will be able to implement an application on real life large dataset as a group activity

Subject: Computer Simulation and Modeling

- ITC803.1 Student will be able to describe the common applications of discrete-event system simulation.
- ITC803.2 Student will be able to demonstrate formulation and modeling skills as well as analyze events and inter-arrival time, arrival process, queuing strategies, resources.
- ITC803.3 Student will be able to simulate using spreadsheets as well as simulation language/package
- ITC803.4 Students will be able to generate and test pseudorandom numbers using different Methods
- ITC803.5 Students will be able to analyze and fit the collected data to different distributions
- ITC803.6 Students will be able to create simulation of complex real world system and present.

Subject: Software Testing & Quality Assurance

- ITC8046.1 Student will be able to Identify the reasons for bugs and analyze the principles in software testing to prevent and remove bugs.
- ITC8046.2 Student will be able to Implement various test processes for quality improvement
- ITC8046.3 Student will be able to apply the software testing techniques in commercial environments
- ITC8046.4 Student will be able to compare variety of ways to test software and an understanding of some of the trade-offs between testing techniques.
- ITC8046.5 Student will be able to use open source testing tools
- ITC8046.6 Student will be able to identify software quality standards that will be useful for their future project testing

Subject: Project B

- ITC806.1 Student should be able to apply knowledge of mathematics, science, engineering fundamentals and analyze complex engineering problems reaching substantiated conclusions
- ITC806.2 Student should be able to conduct investigations and design the solution of the problem for the benefit of society and environment.
- ITC806.3 Students should be able to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues in their project specialization.
- ITC806.4 Student should be able to apply and commit to professional ethics for various engineering practices to maintain sustainability.
- ITC806.5 Student will be able to experience the issues involved in creation ,design and demonstration of simple products and prepare them to engage in independent and life- long learning
- ITC806.6 Student should be able to work effectively as an individual or in a team by managing the finance, timeline and produce the documents.