



# ACE

## Engineering College

An Autonomous Institution

### DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE STRUCTURE

#### III B.Tech I Semester

S.No	Course Type	Course Code	Course Title	Periods Per Week			Credits
				L	T	P	
1	PCC	CS501PC	Formal Languages & Automata Theory	3	0	0	3
2	PCC	CS502PC	Software Engineering	3	0	0	3
3	PCC	IT503PC	Data Communication & Computer Networks	3	1	0	4
4	PCC	IT504PC	Web Programming	2	0	0	2
5	PEC		Professional Elective - I	3	0	0	3
6	PEC		Professional Elective - II	3	0	0	3
7	PCC	CS505PC	Software Engineering Lab	0	0	3	1.5
8	PCC	IT506PC	Computer Networks & Web Programming Lab	0	0	3	1.5
9	HSMC	EN508HS	Advanced Communication Skills Lab	0	0	2	1
10	MC	*MC510	Intellectual Property Rights	3	0	0	0
11	MC	*MC511	Artificial Intelligence	3	0	0	0
Total Credits				23	1	8	22

# DEPARTMENT OF INFORMATION TECHNOLOGY

## SYLLABUS

  
Member Secretary

  
Chairman

**CS501PC: FORMAL LANGUAGES AND AUTOMATA THEORY****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS501PC</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>				<b>Total Classes: 45</b>		

**Prerequisite:** Nil**Course Objectives:**

- To provide introduction to some of the central ideas of theoretical computer science from the perspective of formal languages.
- To introduce the fundamental concepts of formal languages, grammars and automata theory.
- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- To understand deterministic and non-deterministic machines.
- To understand the differences between decidability and undecidability.

**Course Outcomes:**

- Able to understand the concept of abstract machines and their power to recognize the languages.
- Able to employ finite state machines for modeling and solving computing problems.
- Able to design context free grammars for formal languages.
- Able to distinguish between decidability and undecidability.
- Able to gain proficiency with mathematical tools and formal methods.

**UNIT: I****INTRODUCTION TO FINITE AUTOMATA****No.of Classes: 09**

**Introduction to Finite Automata:** Structural Representations, Automata and Complexity, the Central Concepts of Automata Theory – Alphabets, Strings, Languages, Problems.

**Nondeterministic Finite Automata:** Formal Definition, an application, Text Search, Finite Automata with Epsilon-Transitions.

**Deterministic Finite Automata:** Definition of DFA, How A DFA Process Strings, The language of DFA, Conversion of NFA with  $\epsilon$ -transitions to NFA without  $\epsilon$ -

transitions. Conversion of NFA to DFA, Moore and Melay machines.

## UNIT: II

## REGULAR EXPRESSIONS

No.of Classes: 09

**Regular Expressions:** Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Conversion of Finite Automata to Regular Expressions.

**Pumping Lemma for Regular Languages,** Statement of the pumping lemma, Applications of the Pumping Lemma.

**Closure Properties of Regular Languages:** Closure properties of Regular languages, Decision Properties of Regular Languages, Equivalence and Minimization of Automata.

## UNIT: III

## CONTEXT-FREE GRAMMARS

No.of Classes: 09

**Context-Free Grammars:** Definition of Context-Free Grammars, Derivations Using a Grammar, Leftmost and Rightmost Derivations, the Language of a Grammar, Sentential Forms, Parse Tree, Applications of Context-Free Grammars, Ambiguity in Grammars and Languages.

**Push Down Automata:** Definition of the Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Acceptance by final state, Acceptance by empty stack, Deterministic Pushdown Automata. From CFG to PDA, From PDA to CFG.

## UNIT: IV

## NORMAL FORMS FOR CONTEXT- FREE GRAMMARS

No.of Classes: 09

**Normal Forms for Context- Free Grammars:** Eliminating useless symbols, Eliminating  $\epsilon$ -Productions. Chomsky Normal form Greibach Normal form.

**Pumping Lemma for Context-Free Languages:** Statement of pumping lemma, Applications

**Closure Properties of Context-Free Languages:** Closure properties of CFL's, Decision Properties of CFL's

**Turing Machines:** Introduction to Turing Machine, Formal Description, Instantaneous description, The language of a Turing machine.

## UNIT: V

## TYPES OF TURING MACHINE

No.of Classes: 09

**Types of Turing machine:** Turing machines and halting

**Undecidability:** Undecidability, A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines, Recursive languages, Properties of recursive languages, Post's Correspondence Problem, Modified Post Correspondence problem, Other Undecidable Problems, Counter machines.

### Text Books:

1. Introduction to Automata Theory, Languages, and Computation, 3<sup>rd</sup> Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Theory of Computer Science – Automata languages and computation, Mishra and Chandrashekar, 2nd edition, PHI.

**Reference Books:**

1. Introduction to Languages and The Theory of Computation, John C Martin, TMH.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. A Text book on Automata Theory, P. K. Srimani, Nasir S. F. B, Cambridge University Press.
4. Introduction to the Theory of Computation, Michael Sipser, 3<sup>rd</sup> edition, Cengage Learning.
5. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan, Rama R, Pearson.

**Web References:**

1. <https://nptel.ac.in/courses/111/103/111103016/>
2. <https://nptel.ac.in/courses/106/104/106104028/>
3. <https://www.digimat.in/nptel/courses/video/106101061/L01.html>

**E-Text Books:**

1. [http://ce.sharif.edu/courses/94-95/1/ce414-2/resources/root/Text%20Books/Automata/John%20E.%20Hopcroft,%20Rajeev%20Motwani,%20Jeffrey%20D.%20Ullman-Introduction%20to%20Automata%20Theory,%20Languages,%20and%20Computations-Prentice%20Hall%20\(2006\).pdf](http://ce.sharif.edu/courses/94-95/1/ce414-2/resources/root/Text%20Books/Automata/John%20E.%20Hopcroft,%20Rajeev%20Motwani,%20Jeffrey%20D.%20Ullman-Introduction%20to%20Automata%20Theory,%20Languages,%20and%20Computations-Prentice%20Hall%20(2006).pdf)
2. <https://cseexamhacks.files.wordpress.com/2017/02/toc-klp-mishra.pdf>

**CS502PC: SOFTWARE ENGINEERING****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS502PC</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>		<b>Practical Classes: Nil</b>				<b>Total Classes: 45</b>		

**Prerequisite:** Nil**Course Objectives:**

- The aim of the course is to provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.
- Topics include process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams

**Course Outcomes:**

- Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
- Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
- Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

**UNIT: I****INTRODUCTION TO SOFTWARE ENGINEERING****No.of Classes: 09**

**Introduction to Software Engineering:** The evolving role of software, changing nature of software, software myths.

**A Generic view of process:** Software engineering- a layered technology, a process framework, the capability maturity model integration (CMMI), process patterns, process assessment, personal and team process models.

**Process models:** The waterfall model, incremental process models, evolutionary process models, the unified process.

**UNIT: II****SOFTWARE REQUIREMENTS****No.of Classes: 09**

**Software Requirements:** Functional and non-functional requirements, user requirements, system requirements, interface specification, the software requirements document.

**Requirements engineering process:** Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

**System models:** Context models, behavioral models, data models, object models, structured methods.

UNIT: III	DESIGN ENGINEERING	No.of Classes: 09
<b>Design Engineering:</b> Design process and design quality, design concepts, the design model. <b>Creating an architectural design:</b> software architecture, data design, architectural styles and patterns, architectural design, conceptual model of UML, basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams.		
UNIT: IV	TESTING STRATEGIES	No.of Classes: 09
<b>Testing Strategies:</b> A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, validation testing, system testing, the art of debugging. <b>Product metrics:</b> Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.		
UNIT: V	Metrics for Process and Products	No.of Classes: 09
<b>Metrics for Process and Products:</b> Software measurement, metrics for software quality. <b>Risk management:</b> Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan. <b>Quality Management:</b> Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.		
<b>Text Books:</b> <ol style="list-style-type: none"> <li>1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6<sup>th</sup> edition, Mc Graw Hill International Edition.</li> <li>2. Software Engineering- Sommerville, 7<sup>th</sup> edition, Pearson Education.</li> <li>3. The unified modeling language user guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.</li> </ol>		
<b>Reference Books:</b> <ol style="list-style-type: none"> <li>1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.</li> <li>2. Software Engineering principles and practice- Waman S Jawadekar, The Mc Graw-Hill Companies.</li> <li>3. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.</li> </ol>		
<b>Web References:</b> <ol style="list-style-type: none"> <li>1. <a href="https://www.digimat.in/nptel/courses/video/106101061/L01.html">https://www.digimat.in/nptel/courses/video/106101061/L01.html</a></li> </ol>		
<b>E-Text Books:</b> <ol style="list-style-type: none"> <li>1. <a href="https://repository.dinus.ac.id/docs/ajar/Software_Engineering_-_Pressman.pdf">https://repository.dinus.ac.id/docs/ajar/Software_Engineering_-_Pressman.pdf</a></li> <li>2. <a href="https://personal.utdallas.edu/~chung/Fujitsu/UML_2.0/Rumbaugh--UML_2.0_Reference_CD.pdf">https://personal.utdallas.edu/~chung/Fujitsu/UML_2.0/Rumbaugh--UML_2.0_Reference_CD.pdf</a></li> </ol>		

**IT503PC: DATA COMMUNICATION AND COMPUTER NETWORKS**

B.Tech. III Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
IT503PC	Core	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil				Total Classes: 60		
Prerequisite: Nil								
<b>Course Objectives:</b> <ul style="list-style-type: none"><li>To introduce the fundamental various types of computer networks.</li><li>To demonstrate the TCP/IP and OSI models with merits and demerits.</li><li>To explore the various layers of OSI Model.</li><li>To introduce UDP and TCP Models.</li></ul>								
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>Students should be understand and explore the basics of Computer Networks and Various Protocols. He/She will be in a position to understand the World Wide Web concepts.</li><li>Students will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile and ad hoc networks.</li></ul>								
UNIT: I	DATA COMMUNICATIONS					No.of Classes: 09		
Data Communications: Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model, Example Networks such as ATM, Frame Relay, ISDN Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.								
UNIT: II	DATA LINK LAYER					No.of Classes: 09		
Data link layer: Introduction, Framing, and Error – Detection and Correction – Parity – LRC – CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. 111 Medium Access sub layer: ALOHA, CSMA/CD, LAN – Ethernet IEEE 802.3, IEEE 802.5 – IEEE 802.11, Random access, Controlled access, Channelization.								
UNIT: III	NETWORK LAYER					No.of Classes: 09		
Network layer: Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.								
UNIT: IV	TRANSPORT LAYER					No.of Classes: 09		
Transport Layer: Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.								
UNIT: V	APPLICATION LAYER					No.of Classes: 09		



**Application Layer:** Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP.

**Text Books:**

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition TMH, 2006.
2. Computer Networks, Andrew S Tanenbaum, 4<sup>th</sup> Edition. Pearson Education, PHI.

**Reference Books:**

1. Data communications and Computer Networks, P.C Gupta, PHI.
2. An Engineering Approach to Computer Networks, S. Keshav, 2<sup>nd</sup> Edition, Pearson Education.
3. Understanding communications and Networks, 3<sup>rd</sup> Edition, W.A. Shay, Cengage Learning.
4. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose & Keith W. Ross, 3<sup>rd</sup> Edition, Pearson Education.
5. Data and Computer Communication, William Stallings, Sixth Edition, Pearson Education, 2000

**Web References:**

1. <http://intronetworks.cs.luc.edu/current/ComputerNetworks.pdf>
2. <https://www.javatpoint.com/computer-network-tutorial>

**E-Text Books:**

1. <http://eti2506.elimu.net/Introduction/Books/Data%20Communications%20and%20Networking%20By%20Behrouz%20A.Forouzan.pdf>
2. <https://www.mbit.edu.in/wp-content/uploads/2020/05/Computer-Networks-5th-Edition.pdf>

**IT504PC: WEB PROGRAMMING****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>IT504PC</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		2	0	0	2	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>				<b>Total Classes: 45</b>		

**Prerequisite:** Nil**Course Objectives:**

- Understand the technologies used in Web Programming.
- Know the importance of object-oriented aspects of Scripting.
- Understand creating database connectivity using JDBC.
- To introduce PHP language for server-side scripting
- To introduce XML and processing of XML Data with Java

**Course Outcomes:**

- Gain knowledge of client-side scripting, validation of forms
- To introduce Server-side programming with Java Servlets and JSP
- understand server-side scripting with PHP language
- understand what is XML and how to parse and use **XML** Data with Java

**UNIT: I****SCRIPTING****No.of Classes: 09**

Web page Designing using HTML, Scripting basics- Client side and server side scripting. Java Script- Object, names, literals, operators and expressions- statements and features- events - windows - documents - frames - data types - built-in functions- Browser object model - Verifying forms.-HTML5- CSS3- HTML 5 canvas - Web site creation using tools.

**UNIT: II****JDBC****No.of Classes: 09**

**JDBC Overview** - JDBC implementation – Connection class – Statements - Catching Database Results, handling database Queries.

**Introduction to Servlets:** Life cycle of a Servlet, Reading Servlet parameters, Reading Initialization parameters, The Servlet API, Handling HTTP Request and Response, Using Cookies, Session Tracking, connecting to a database using JDBC.

**UNIT: III****JSP****No.of Classes: 09**

**Introduction to JSP:** The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

**UNIT: IV****INTRODUCTION TO PHP****No.of Classes: 09**

**Introduction to PHP:** Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

**File Handling in PHP:** File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

**UNIT: V**

**XML AND WEB SERVICES**

**No.of Classes: 09**

**Xml** - Introduction-Form Navigation-XML Documents- XSL – XSLT- Web services- UDDI-WSDL-Java web services – Web resources.

**Text Books:**

1. Harvey Deitel, Abbey Deitel, Internet and World Wide Web: How To Program 5th Edition.
2. Web Technologies, Uttam K Roy, Oxford University Press
3. The Complete Reference PHP — Steven Holzner, Tata McGraw-Hill
4. Michael Morrison XML Unleashed Tech media SAMS.

**Reference Books:**

1. Web Programming, building internet applications, Chris Bates 2<sup>nd</sup> edition, Wiley Dreamtech
2. Java Server Pages —Hans Bergsten, SPD O'Reilly,
3. John Pollock, Javascript - A Beginners Guide, 3rd Edition -- Tata McGraw-Hill Edition.

**Web References:**

1. <https://freevideolectures.com/course/2308/internet-technology/25>
2. [http://www.nptelvideos.com/php/php\\_video\\_tutorials.php](http://www.nptelvideos.com/php/php_video_tutorials.php)

**E-Text Books:**

1. <http://index-of.es/Java/O'Reilly%20-%20JavaServer%20Pages.pdf>
2. <https://www.auhd.site/upfiles/elibrary/Azal2020-01-22-01-38-51-40850.pdf>
3. <https://books.google.co.in/books?id=bGS4CmJY0I8C&pg=PR4&lpg=PR4&dq=The+Complete+Reference+PHP+%E2%80%94+Steven+Holzner,+Tata+McGraw-Hill&source=bl&ots=V2H0mxUwiZ&sig=ACfU3U3m6DqTkNhmr3Zw67G9JQnlGqJeBw&hl=en&sa=X&ved=2ahUKEwjqsJD-Yz0AhVqxzgGHbgQBRk4FBD0AXoECAGQAw#v=onepage&q&f=false>

**IT511PE: BIOMETRICS (Professional Elective - I)**

B.Tech. III Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
IT511PE	Elective	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		
<b>Prerequisite:</b> 1. Information security 2. Network Security								
<b>Course Objectives:</b> <ul style="list-style-type: none"><li>Will learn the biometric technologies.</li><li>Learn the computational methods involved in the biometric systems.</li><li>Learn methods for evaluation of the reliability and quality of the biometric systems.</li></ul>								
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>Identify the various Biometric technologies.</li><li>Design of biometric recognition for the organization.</li><li>Develop simple applications for privacy.</li><li>Understand the watermarking techniques of biometrics.</li><li>Understand the research on biometric techniques.</li><li>Understand the need of biometric in the society.</li></ul>								
UNIT: I	INTRODUCTION & HANDWRITTEN CHARACTER RECOGNITION				No.of Classes: 09			
Introduction & Handwritten Character Recognition: Introduction, history, type of Biometrics, General Architecture of Biometric Systems, Basic Working of biometric Matching, Biometric System Error and performance Measures, Design of Biometric Systems, Applications of Biometrics, Benefits of Biometrics Versus Traditional Authentication Methods, character Recognition, System Overview, Gesture Extraction for character Recognition, Neural Network for handwritten Character Recognition, Multilayer Neural Network for Handwritten Character Recognition, Devanagari Numeral Recognition, Isolated Handwritten Devanagari Character Recognition using Fourier Descriptor and Hidden markov Model.								
UNIT: II	FACE BIOMETRICS & RETINA AND IRIS BIOMETRICS				No.of Classes: 09			
Face Biometrics & Retina And Iris Biometrics Introduction, Background of Face Recognition, Design of Face Recognition System, Neural Network for Face Recognition, Face Detection in Video Sequences, Challenges in Face Biometrics, Face Recognition Methods, Advantages and Disadvantages, Performance of Biometrics, Design of Retina Biometrics, Iris Segmentation Method, Determination of Iris Region, Experimental Results of Iris Localization, Applications of Iris Biometrics, Advantages and Disadvantages. Vein and Fingerprint Biometrics &								

Biometric Hand Gesture Recognition For Indian Sign Language. Biometrics Using Vein Pattern of Palm, Fingerprint Biometrics, Fingerprint Recognition System, Minutiae Extraction, Fingerprint Indexing, Experimental Results, Advantages and Disadvantages, Basics of Hand Geometry, Sign Language, Indian Sign Language, SIFT Algorithms- Practical Approach Advantages and Disadvantages.

**UNIT: III**

**PRIVACY ENHANCEMENT USING BIOMETRICS & BIOMETRIC CRYPTOGRAPHY AND MULTIMODAL BIOMETRICS**

**No.of Classes: 09**

**Privacy Enhancement Using Biometrics & Biometric Cryptography And Multimodal Biometrics:** Introduction, Privacy Concerns Associated with Biometric Developments, Identity and Privacy, Privacy Concerns, Biometrics with Privacy Enhancement, Comparison of Various Biometrics in Terms of Privacy, Soft Biometrics - Introduction to Biometric Cryptography, General Purpose Cryptosystem, Modern Cryptography and Attacks, Symmetric Key Ciphers, Cryptographic Algorithms, Introduction to Multimodal Biometrics, Basic Architecture of Multimodal Biometrics, Multimodal Biometrics Using Face and Ear, Characteristics and Advantages of Multimodal Biometrics Characters, AADHAAR : An Application of Multimodal Biometrics.

**UNIT: IV**

**WATERMARKING TECHNIQUES & BIOMETRICS**

**No.of Classes: 09**

**Watermarking Techniques & Biometrics :** Scope And Future Introduction, Data Hiding Methods, Basic Framework of Watermarking, Classification of Watermarking, Applications of Watermarking, Attacks on Watermarks, Performance Evaluation, Characteristics of Watermarks, General Watermarking Process, Image Watermarking Techniques, Watermarking Algorithm, Experimental Results, Effect of Attacks on Watermarking Techniques, Scope and Future Market of Biometrics, Biometric Technologies, Applications of Biometrics -Biometrics, and Information Technology Infrastructure, Role of Biometrics in Enterprise Security, Role of Biometrics in Border Security, Smart Card Technology and Biometric, Radio Frequency Identification Biometrics, DNA Biometrics, Comparative Study of Various Biometrics Techniques.

**UNIT: V**

**IMAGE ENHANCEMENT TECHNIQUES & BIOMETRICS STANDS**

**No.of Classes: 09**

**Image Enhancement Techniques & Biometrics Stands:** Introduction, current Research in image Enhancement Techniques, Image Enhancement, Frequency Domain Filters, Databases and Implementation, Standard Development Organizations, Application Programming Interface, Information Security and Biometric Standards, Biometric Template Interoperability.

**Text Books:**

1. G r Sinha and Sandeep B. Patil, Biometrics: concepts and applications, Wiely, 2013.
2. Paul Reid, Biometrics for Network Security, Pearson Education.

**Reference Books:**

1. Samir Nanavathi, Micheal Thieme and Raj Nanavathi, Biometrics, Identity verification in a networked world, Wiley, dream Tech.
2. John D. Woodward and Jr. Wiley Dreamtech, Biometrics, The Ultimate Reference.

**Web References:**


1. <https://www.biometricsinstitute.org>
2. [https://www.tutorialspoint.com/biometrics/biometrics\\_quick\\_guide.htm](https://www.tutorialspoint.com/biometrics/biometrics_quick_guide.htm)

**E-Text Books:**

1. <http://nptel.ac.in>
2. <https://www.coursera.org>



Member Secretary

  
Chairman

**CS512PE: ADVANCED COMPUTER ARCHITECTURE (Professional Elective - I)**

B.Tech. III Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS512PE	Elective	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		
Prerequisite: Computer Organization								
<b>Course Objectives:</b> <ul style="list-style-type: none"><li>To impart the concepts and principles of parallel and advanced computer architectures.</li><li>To develop the design techniques of Scalable and multithreaded Architectures.</li><li>To Apply the concepts and techniques of parallel and advanced computer architectures to design modern computer systems</li></ul>								
<b>Course Outcomes:</b> Gain knowledge of <ul style="list-style-type: none"><li>Computational models and Computer Architectures.</li><li>Concepts of parallel computer models.</li><li>Scalable Architectures, Pipelining, Superscalar processors, multiprocessors</li></ul>								
UNIT: I					No.of Classes: 09			
Theory of Parallelism, Parallel computer models, The State of Computing, Multiprocessors and Multicomputers, Multivector and SIMD Computers, PRAM and VLSI models, Architectural development tracks, Program and network properties, Conditions of parallelism, Program partitioning and Scheduling, Program flow Mechanisms, System interconnect Architectures.								
UNIT: II					No.of Classes: 09			
Principals of Scalable performance, Performance metrics and measures, Parallel Processing applications, Speed up performance laws, Scalability Analysis and Approaches, Hardware Technologies, Processes and Memory Hierarchy, Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.								
UNIT: III					No.of Classes: 09			
Bus Cache and Shared memory, Backplane bus systems, Cache Memory organizations, Shared- Memory Organizations, Sequential and weak consistency models, Pipelining and superscalar techniques, Linear Pipeline Processors, Non-Linear Pipeline Processors, Instruction Pipeline design, Arithmetic pipeline design, superscalar pipeline design.								
UNIT: IV					No.of Classes: 09			
Parallel and Scalable Architectures, Multiprocessors and Multicomputers, Multiprocessor system interconnects, cache coherence and synchronization mechanism, Three Generations of Multicomputers, Message-passing Mechanisms,								

Multivector and SIMD computers, Vector Processing Principals, Multivector Multiprocessors, Compound Vector processing, SIMD computer Organizations, The connection machine CM-5.

**UNIT: V**

**No.of Classes: 09**

Scalable, Multithreaded and Dataflow Architectures, Latency-hiding techniques, Principals of Multithreading, Fine-Grain Multicomputers, Scalable and multithreaded Architectures, Dataflow and hybrid Architectures.

**Text Books:**

1. Advanced Computer Architecture Second Edition, Kai Hwang, Tata McGraw Hill Publishers.

**Reference Books:**

1. Computer Architecture, Fourth edition, J. L. Hennessy and D.A. Patterson. ELSEVIER.
2. Advanced Computer Architectures, S.G. Shiva, Special Indian edition, CRC, Taylor & Francis.
3. Introduction to High Performance Computing for Scientists and Engineers, G. Hager and G. Wellein, CRC Press, Taylor & Francis Group.
4. Advanced Computer Architecture, D. Sima, T. Fountain, P. Kacsuk, Pearson education.
5. Computer Architecture, B. Parhami, Oxford Univ. Press.

**Web References:**

1. <https://nptel.ac.in/courses/106/103/106103206/>

**E-Text Books:**

1. <https://www.ashish2312.files.wordpress.com/2015/01/computer-architecture-kai-hwang-by-d.pdf>
2. <http://prdrklaina.weebly.com/uploads/5/7/7/3/5773421/introduction-to-high-performance-computing-for-scientists-and-engineers.pdf>



**CS513PE: DATA ANALYTICS (Professional Elective - I)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS513PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>				<b>Total Classes: 45</b>		

**Prerequisite:**

1. A course on "Database Management Systems".
2. Knowledge of probability and statistics.

**Course Objectives:**

- To explore the fundamental concepts of data analytics.
- To learn the principles and methods of statistical analysis
- Discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.
- To understand the various search methods and visualization techniques.

**Course Outcomes:** After completion of this course students will be able to

- Understand the impact of data analytics for business decisions and strategy
- Carry out data analysis/statistical analysis
- To carry out standard data visualization and formal inference procedures
- Design Data Architecture
- Understand various Data Sources

**UNIT: I****DATA MANAGEMENT****No.of Classes: 09**

**Data Management:** Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/Signals/GPS etc. Data Management, Data Quality(noise, outliers, missing values, duplicate data) and Data Processing & Processing.

**UNIT: II****DATA ANALYTICS****No.of Classes: 09**

**Data Analytics:** Introduction to Analytics, Introduction to Tools and Environment, Application of Modeling in Business, Databases & Types of Data and variables, Data Modeling Techniques, Missing Imputations etc. Need for Business Modeling.

**UNIT: III****REGRESSION****No.of Classes: 09**

**Regression** - Concepts, Blue property assumptions, Least Square Estimation, Variable Rationalization, and Model Building etc.

**Logistic Regression:** Model Theory, Model fit Statistics, Model Construction, Analytics applications to various Business Domains etc.

**UNIT: IV****OBJECT SEGMENTATION****No.of Classes: 09**

**Object Segmentation:** Regression Vs Segmentation – Supervised and Unsupervised Learning, Tree Building – Regression, Classification, Overfitting, Pruning and Complexity, Multiple Decision Trees etc. Time Series Methods: Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average Energy etc and Analyze for prediction

**UNIT: V**

**DATA VISUALIZATION**

**No.of Classes: 09**

**Data Visualization:** Pixel-Oriented Visualization Techniques, Geometric Projection Visualization Techniques, Icon-Based Visualization Techniques, Hierarchical Visualization Techniques, Visualizing Complex Data and Relations.

**Text Books:**

1. Student's Handbook for Associate Analytics – II, III.
2. Data Mining Concepts and Techniques, Han, Kamber, 3<sup>rd</sup> Edition, Morgan Kaufmann Publishers.

**Reference Books:**

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley, 2006.
2. Data Mining Analysis and Concepts, M. Zaki and W. Meira
3. Mining of Massive Datasets, Jure Leskovec Stanford Univ. Anand Rajaraman Millway Labs Jeffrey D Ullman Stanford Univ.

**Web References:**

1. [https://hanj.cs.illinois.edu/bk3/bk3\\_slidesindex.htm](https://hanj.cs.illinois.edu/bk3/bk3_slidesindex.htm)
2. <https://nptel.ac.in/courses/106/107/106107220/>

**E-Text Books:**

1. [http://jntuhds.in/programme-units/0NYNXINOUB\\_tZ1iRWXtQW4y44Ex1Zj9jiingriozQtv5tH7USlySXTiAMPKd6yawe0Lot8N\\_3chN1c9zwAzA1Q/1](http://jntuhds.in/programme-units/0NYNXINOUB_tZ1iRWXtQW4y44Ex1Zj9jiingriozQtv5tH7USlySXTiAMPKd6yawe0Lot8N_3chN1c9zwAzA1Q/1)
2. <http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf>

**CS514PE: IMAGE PROCESSING (Professional Elective - I)**

B.Tech. III Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS514PE	Elective	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		
<b>Prerequisite:</b> <ol style="list-style-type: none"><li>Students are expected to have knowledge in linear signals and systems, Fourier Transform, basic linear algebra, basic probability theory and basic programming techniques; knowledge of Digital Signal Processing is desirable.</li><li>A course on “Computational Mathematics”</li><li>A course on “Computer Oriented Statistical Methods”</li></ol>								
<b>Course Objectives:</b> <ul style="list-style-type: none"><li>Provide a theoretical and mathematical foundation of fundamental Digital Image Processing concepts.</li><li>The topics include image acquisition; sampling and quantization; preprocessing; enhancement; restoration; segmentation; and compression.</li></ul>								
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.</li><li>Demonstrate the knowledge of filtering techniques.</li><li>Demonstrate the knowledge of 2D transformation techniques.</li><li>Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.</li></ul>								
UNIT: I						No.of Classes: 09		
Digital Image Fundamentals: Digital Image through Scanner, Digital Camera. Concept of Gray Levels. Gray Level to Binary Image Conversion. Sampling and Quantization. Relationship between Pixels. Imaging Geometry. 2D Transformations- DFT, DCT, KLT and SVD.								
UNIT: II						No.of Classes: 09		
Image Enhancement in Spatial Domain Point Processing, Histogram Processing, Spatial Filtering, Enhancement in Frequency Domain, Image Smoothing, Image Sharpening.								
UNIT: III						No.of Classes: 09		
Image Restoration Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.								
UNIT: IV						No.of Classes: 09		

Image Segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Oriented Segmentation.

**UNIT: V**

**No.of Classes: 09**

Image Compression Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Source Encoder and Decoder, Error Free Compression, Lossy Compression.

**Text Books:**

1. Digital Image Processing: R.C. Gonzalez & R. E. Woods, Addison Wesley/ Pearson Education, 2<sup>nd</sup> Ed, 2004.

**Reference Books:**

1. Fundamentals of Digital Image Processing: A. K. Jain, PHI.
2. Digital Image Processing using MATLAB: Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins: Pearson Education India, 2004.
3. Digital Image Processing: William K. Pratt, John Wiley, 3<sup>rd</sup> Edition, 2004.

**Web References:**

1. <https://nptel.ac.in/courses/117/105/117105135/>
2. <http://www.nptelvideos.in/2012/12/digital-image-processing.html>
3. <https://www.coursera.org/learn/digital>

**E-Text Books:**

1. <https://www.codecool.ir/extra/2020816204611411Digital.Image.Processing.4th.Edition.www.EBooksWorld.ir.pdf>
2. <https://preetikale.files.wordpress.com/2018/07/fundamentals-of-digital-image-processing-ak-jain.pdf>

**CS515PE: PRINCIPLES OF PROGRAMMING LANGUAGES (Professional Elective - I)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS515PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:**

1. A course on "Mathematical Foundations of Computer Science"
2. A course on "Computer Programming and Data Structures"

**Course Objectives:**

- Introduce important paradigms of programming languages
- To provide conceptual understanding of high-level language design and implementation
- Topics include programming paradigms; syntax and semantics; data types, expressions and statements; subprograms and blocks; abstract data types; concurrency; functional and logic programming languages; and scripting languages

**Course Outcomes:**

- Acquire the skills for expressing syntax and semantics in formal notation
- Identify and apply a suitable programming paradigm for a given computing application
- Gain knowledge of and able to compare the features of various programming languages

**UNIT: I****PRELIMINARY CONCEPTS****No.of Classes: 09**

**Preliminary Concepts:** Reasons for Studying Concepts of Programming Languages, Programming Domains, Language Evaluation Criteria, Influences on Language Design, Language Categories, Language Design Trade-Offs, Implementation Methods, Programming Environments

**Syntax and Semantics:** General Problem of Describing Syntax and Semantics, Formal Methods of Describing Syntax, Attribute Grammars, Describing the Meanings of Programs

**UNIT: II****NAMES, BINDINGS, AND SCOPES****No.of Classes: 09**

**Names, Bindings, and Scopes:** Introduction, Names, Variables, Concept of Binding, Scope, Scope and Lifetime, Referencing Environments, Named Constants

**Data Types:** Introduction, Primitive Data Types, Character String Types, User Defined Ordinal Types, Array, Associative Arrays, Record, Union, Tuple Types, List Types, Pointer and Reference Types, Type Checking, Strong Typing, Type Equivalence

**Expressions and Statements:** Arithmetic Expressions, Overloaded Operators, Type Conversions, Relational and Boolean Expressions, Short Circuit Evaluation, Assignment Statements, Mixed-Mode Assignment

**Control Structures** - Introduction, Selection Statements, Iterative Statements, Unconditional Branching, Guarded Commands.

UNIT: III	SUBPROGRAMS AND BLOCKS	No.of Classes: 09
<p><b>Subprograms and Blocks:</b> Fundamentals of Sub-Programs, Design Issues for Subprograms, Local Referencing Environments, Parameter Passing Methods, Parameters that Are Subprograms, Calling Subprograms Indirectly, Overloaded Subprograms, Generic Subprograms, Design Issues for Functions, User Defined Overloaded Operators, Closures, Coroutines</p> <p><b>Implementing Subprograms:</b> General Semantics of Calls and Returns, Implementing Simple Subprograms, Implementing Subprograms with Stack-Dynamic Local Variables, Nested Subprograms, Blocks, Implementing Dynamic Scoping</p> <p><b>Abstract Data Types:</b> The Concept of Abstraction, Introductions to Data Abstraction, Design Issues, Language Examples, Parameterized ADT, Encapsulation Constructs, Naming Encapsulations</p>		
UNIT: IV	CONCURRENCY	No.of Classes: 09
<p><b>Concurrency:</b> Introduction, Introduction to Subprogram Level Concurrency, Semaphores, Monitors, Message Passing, Java Threads, Concurrency in Function Languages, Statement Level Concurrency. Exception Handling and Event Handling: Introduction, Exception Handling in Ada, C++, Java, Introduction to Event Handling, Event Handling with Java and C#.</p>		
UNIT: V	FUNCTIONAL PROGRAMMING LANGUAGES	No.of Classes: 09
<p><b>Functional Programming Languages:</b> Introduction, Mathematical Functions, Fundamentals of Functional Programming Language, LISP, Support for Functional Programming in Primarily Imperative Languages, Comparison of Functional and Imperative Languages</p> <p><b>Logic Programming Language:</b> Introduction, an Overview of Logic Programming, Basic Elements of Prolog, Applications of Logic Programming.</p> <p><b>Scripting Language:</b> Pragmatics, Key Concepts, Case Study: Python – Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library. (Text Book 2)</p>		
<p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Concepts of Programming Languages Robert. W. Sebesta 10/E, Pearson Education.</li> <li>2. Programming Language Design Concepts, D. A. Watt, Wiley Dreamtech, 2007.</li> </ol>		
<p><b>Reference Books:</b></p> <ol style="list-style-type: none"> <li>1. Programming Languages, 2nd Edition, A.B. Tucker, R. E. Noonan, TMH.</li> <li>2. Programming Languages, K. C. Loudon, 2nd Edition, Thomson, 2003</li> </ol>		
<p><b>Web References:</b></p> <ol style="list-style-type: none"> <li>1. <a href="http://www.nptelvideos.in/2012/11/principles-of-programming-languages.html">http://www.nptelvideos.in/2012/11/principles-of-programming-languages.html</a></li> </ol>		
<p><b>E-Text Books:</b></p> <ol style="list-style-type: none"> <li>1. <a href="https://www.ime.usp.br/~alvaroma/ucsp/proglang/book.pdf">https://www.ime.usp.br/~alvaroma/ucsp/proglang/book.pdf</a></li> <li>2. <a href="http://www.dcc.ic.uff.br/~isabel/LP/D.Watt.pdf">http://www.dcc.ic.uff.br/~isabel/LP/D.Watt.pdf</a></li> </ol>		

**CS521PE: COMPUTER GRAPHICS (Professional Elective - II)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS521PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:**

1. Familiarity with the theory and use of coordinate geometry and of linear algebra such as matrix multiplication.
2. A course on "Computer Programming and Data Structures"

**Course Objectives:**

- The aim of this course is to provide an introduction of fundamental concepts and theory of computer graphics.
- Topics covered include graphics systems and input devices; geometric representations and 2D/3D transformations; viewing and projections; illumination and color models; animation; rendering and implementation; visible surface detection;

**Course Outcomes:**

- Acquire familiarity with the relevant mathematics of computer graphics.
- Be able to design basic graphics application programs, including animation
- Be able to design applications that display graphic images to given specifications

**UNIT: I****INTRODUCTION****No.of Classes: 10**

**Introduction:** Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

**Output primitives:** Points and lines, line drawing algorithms (Bresenham's and DDA Algorithm), mid- point circle and ellipse algorithms

**Polygon Filling:** Scan-line algorithm, boundary-fill and flood-fill algorithms

**UNIT: II****2-D GEOMETRICAL TRANSFORMS****No.of Classes: 10**

**2-D geometrical transforms:** Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems

**2-D viewing:** The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland algorithms, Sutherland –Hodgeman polygon clipping algorithm.

**UNIT: III****3-D OBJECT REPRESENTATION****No.of Classes: 05**

**3-D object representation:** Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.



<b>UNIT: IV</b>	<b>3-D GEOMETRIC TRANSFORMATIONS</b>	<b>No.of Classes: 10</b>
<b>3-D Geometric transformations:</b> Translation, rotation, scaling, reflection and shear transformations, composite transformations. <b>3-D viewing:</b> Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.		
<b>UNIT: V</b>	<b>COMPUTER ANIMATION</b>	<b>No.of Classes: 10</b>
<b>Computer animation:</b> Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications <b>Visible surface detection methods:</b> Classification, back-face detection, depth-buffer, BSP-tree methods and area sub-division methods		
<b>Text Books:</b> <ol style="list-style-type: none"> <li>1. "Computer Graphics <i>C version</i>", Donald Hearn and M. Pauline Baker, Pearson Education</li> <li>2. "Computer Graphics Principles &amp; practice", second edition in C, Foley, Van Dam, Feiner and Hughes, Pearson Education.</li> <li>3. Computer Graphics, Steven Harrington, TMH</li> </ol>		
<b>Reference Books:</b> <ol style="list-style-type: none"> <li>1. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2<sup>nd</sup> edition.</li> <li>2. Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.</li> <li>3. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.</li> </ol>		
<b>Web References:</b> <ol style="list-style-type: none"> <li>1. <a href="https://onlinecourses.nptel.ac.in/noc20_cs90/preview">https://onlinecourses.nptel.ac.in/noc20_cs90/preview</a></li> <li>2. <a href="https://nptel.ac.in/courses/106/106/106106090/">https://nptel.ac.in/courses/106/106/106106090/</a></li> </ol>		
<b>E-Text Books:</b>		



**IT521PE: DATABASE SECURITY (Professional Elective - II)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>IT521PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:** Nil**Course Objectives:**

- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

**Course Outcomes:**

- Ability to carry out a risk analysis for large database.
- Ability to set up, and maintain the accounts with privileges and roles.

**UNIT: I****INTRODUCTION****No. of Classes: 09****Introduction:** Introduction to Databases Security Problems in Databases

Security Controls Conclusions

**Security Models -1:** Introduction Access Matrix Model Take-Grant Model Acten

Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and

Martella's Model for Distributed databases

**UNIT: II****SECURITY MODELS -2****No. of Classes: 09****Security Models -2:** Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion**Security Mechanisms:** Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria**UNIT: III****SECURITY SOFTWARE DESIGN****No. of Classes: 09****Security Software Design:** Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design**Statistical Database Protection & Intrusion Detection Systems:** Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls Evaluation Criteria for Control Comparison.

Introduction IDES System RETIS System ASES System Discovery

**UNIT: IV****MODELS FOR THE PROTECTION OF NEW GENERATION DATABASE SYSTEMS -1****No. of Classes: 09**

**Models for the Protection of New Generation Database Systems -1:** Introduction  
A Model for the Protection of Frame Based Systems A Model for the Protection of  
Object-Oriented Systems SORION Model for the Protection of Object-Oriented  
Databases

**UNIT: V**

**MODELS FOR THE PROTECTION OF  
NEW GENERATION DATABASE  
SYSTEMS -2**

**No.of Classes: 09**

**Models for the Protection of New Generation Database Systems -2:** A Model for  
the Protection of New Generation Database Systems: the Orion Model ajodia and  
Kogan's Model A Model for the Protection of Active Databases Conclusions

**Text Books:**

1. Database Security by Castano, Pearson Edition
2. Database Security and Auditing: Protecting Data Integrity and Accessibility,  
1st Edition, Hassan Afyouni, THOMSON Edition.

**Reference Books:**

1. Database security by Alfred basta, melissazgola, CENGAGE learning.

**Web References:**

**E-Text Books:**

**CS522PE: ADVANCED OPERATING SYSTEMS (Professional Elective - II)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS522PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:** Nil**Course Objectives:**

- To study, learn, and understand the main concepts of advanced operating systems (parallel processing systems, distributed systems, real time systems, network operating systems, and open source operating systems)
- Hardware and software features that support these systems.

**Course Outcomes:**

- Understand the design approaches of advanced operating systems
- Analyze the design issues of distributed operating systems.
- Evaluate design issues of multi-processor operating systems.
- Identify the requirements Distributed File System and Distributed Shared Memory.
- Formulate the solutions to schedule the real time applications.

**UNIT: I****ARCHITECTURES OF DISTRIBUTED SYSTEMS****No. of Classes: 09**

**Architectures of Distributed Systems:** System Architecture Types, Distributed Operating Systems, Issues in Distributed Operating Systems, Communication Primitives. Theoretical Foundations: Inherent Limitations of a Distributed System, Lamport's Logical Clocks, Vector Clocks, Causal Ordering of Messages, Termination Detection.


**UNIT: II****DISTRIBUTED MUTUAL EXCLUSION****No. of Classes: 09**

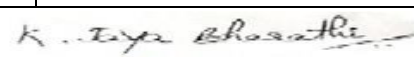
**Distributed Mutual Exclusion:** The Classification of Mutual Exclusion Algorithms,

**Non-Token - Based Algorithms:** Lamport's Algorithm, The Ricart-Agrawala Algorithm, Maekawa's Algorithm, **Token-Based Algorithms:** Suzuki-Kasami's Broadcast Algorithm, Singhal's Heuristic Algorithm, Raymond's Heuristic Algorithm.

**UNIT: III****DISTRIBUTED DEADLOCK DETECTION****No. of Classes: 09**

**Distributed Deadlock Detection:** Preliminaries, Deadlock Handling Strategies in Distributed Systems, Issues in Deadlock Detection and Resolution, Control Organizations for Distributed Deadlock Detection, Centralized- Deadlock - Detection Algorithms, Distributed Deadlock Detection Algorithms, Hierarchical Deadlock Detection Algorithms

**UNIT: IV****MULTIPROCESSOR SYSTEM****No. of Classes: 09**
  
 Member Secretary

  
 Chairman

## ARCHITECTURES

**Multiprocessor System Architectures:** Introduction, Motivation for multiprocessor Systems, Basic Multiprocessor System Architectures **Multi Processor Operating Systems:** Introduction, Structures of Multiprocessor Operating Systems, Operating Design Issues, Threads, Process Synchronization, Processor Scheduling.

**Distributed File Systems:** Architecture, Mechanisms for Building Distributed File Systems, Design Issues

### UNIT: V

### DISTRIBUTED SCHEDULING

No.of Classes: 09

**Distributed Scheduling:** Issues in Load Distributing, Components of a Load Distributed Algorithm, Stability, Load Distributing Algorithms, Requirements for Load Distributing, Task Migration, Issues in task Migration

**Distributed Shared Memory:** Architecture and Motivation, Algorithms for Implementing DSM, Memory Coherence, Coherence Protocols, Design Issues

### Text Books:

1. Advanced Concepts in Operating Systems, Mukesh Singhal, Niranjana G. Shivaratri, Tata McGraw-Hill Edition 2001

### Reference Books:

1. Distributed Systems: Andrew S. Tanenbaum, Maarten Van Steen, Pearson Prentice Hall, Edition – 2, 2007

### Web References:

### E-Text Books:

**IT523PE: MACHINE LEARNING (Professional Elective - II)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>IT523PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:**

1. Data Structures
2. Knowledge on statistical methods

**Course Objectives:**

- This course explains machine learning techniques such as decision tree learning, Bayesian learning etc.
- To understand computational learning theory.
- To study the pattern comparison techniques.

**Course Outcomes:**

- Understand the concepts of computational intelligence like machine learning
- Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
- Understand the Neural Networks and its usage in machine learning application.

**UNIT: I****INTRODUCTION****No.of Classes: 09**

**Introduction** - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning

Concept learning and the general to specific ordering – introduction, a concept learning task, concept learning as search, find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, remarks on version spaces and candidate elimination, inductive bias.

**Decision Tree Learning** – Introduction, decision tree representation, appropriate problems for decision tree learning, the basic decision tree learning algorithm, hypothesis space search in decision tree learning, inductive bias in decision tree learning, issues in decision tree learning.

**UNIT: II****ARTIFICIAL NEURAL NETWORKS-1****No.of Classes: 09**

**Artificial Neural Networks-1**- Introduction, neural network representation, appropriate problems for neural network learning, perceptions, multilayer networks and the back-propagation algorithm.

**Artificial Neural Networks-2**- Remarks on the Back-Propagation algorithm, An illustrative example: face recognition, advanced topics in artificial neural networks.

**Evaluation Hypotheses** - Motivation, estimation hypothesis accuracy, basics of sampling theory, a general approach for deriving confidence intervals, difference in error of two hypotheses, comparing learning algorithms.

**UNIT: III****BAYESIAN LEARNING****No.of Classes: 09**

**Bayesian learning** - Introduction, Bayes theorem, Bayes theorem and concept

learning, Maximum Likelihood and least squared error hypotheses, maximum likelihood hypotheses for predicting probabilities, minimum description length principle, Bayes optimal classifier, Gibbs algorithm, Naïve Bayes classifier, an example: learning to classify text, Bayesian belief networks, the EM algorithm.

**Computational learning theory** - Introduction, probably learning an approximately correct hypothesis, sample complexity for finite hypothesis space, sample complexity for infinite hypothesis spaces, the mistake bound model of learning.

**Instance-Based Learning**- Introduction,  $k$ -nearest neighbour algorithm, locally weighted regression, radial basis functions, case-based reasoning, remarks on lazy and eager learning.

#### UNIT: IV

#### GENETIC ALGORITHMS

No.of Classes: 09

**Genetic Algorithms** - Motivation, Genetic algorithms, an illustrative example, hypothesis space search, genetic programming, models of evolution and learning, parallelizing genetic algorithms.

**Learning Sets of Rules** - Introduction, sequential covering algorithms, learning rule sets: summary, learning First-Order rules, learning sets of First-Order rules: FOIL, Induction as inverted deduction, inverting resolution.

**Reinforcement Learning** - Introduction, the learning task,  $Q$ -learning, non-deterministic, rewards and actions, temporal difference learning, generalizing from examples, relationship to dynamic programming.

#### UNIT: V

#### ANALYTICAL LEARNING-1

No.of Classes: 09

**Analytical Learning-1**- Introduction, learning with perfect domain theories: PROLOG-EBG, remarks on explanation-based learning, explanation-based learning of search control knowledge.

**Analytical Learning-2**-Using prior knowledge to alter the search objective, using prior knowledge to augment search operators.

**Combining Inductive and Analytical Learning** – Motivation, inductive-analytical approaches to learning, using prior knowledge to initialize the hypothesis.

#### Text Books:

1. Machine Learning – Tom M. Mitchell, - MGH

#### Reference Books:

1. Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis

#### Web References:

1. <https://nptel.ac.in/courses/106/105/106105214/>
2. <http://www.cs.nott.ac.uk/~pszqiu/Teaching/G53MLE/index.html>
3. <https://courses.cs.washington.edu/courses/cse546/10wi/>

#### E-Text Books:

1. <https://www.cin.ufpe.br/~cavmj/Machine%20-%20Learning%20-%20Tom%20Mitchell.pdf>

**IT524PE: PATTERN RECOGNITION (Professional Elective - II)****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>IT524PE</b>	<b>Elective</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>				<b>Total Classes: 45</b>		

**Prerequisite:**

- Students are expected to have knowledge basic linear algebra, basic probability theory and basic programming techniques;
- A course on “Computational Mathematics”
- A course on “Computer Oriented Statistical Methods”

**Course Objectives:**

- This course introduces fundamental concepts, theories, and algorithms for pattern recognition and machine learning.
- Topics include: Pattern Representation, Nearest Neighbor Based Classifier, Bayes Classifier, Hidden Markov Models, Decision Trees, Support Vector Machines, Clustering, and an application of hand-written digit recognition.

**Course Outcomes:**

- Understand the theory, benefits, inadequacies and possible applications of various machine learning and pattern recognition algorithms
- Identify and employ suitable machine learning techniques in classification, pattern recognition, clustering and decision problems.

**UNIT: I****INTRODUCTION****No.of Classes: 09**

**Introduction:** What is Pattern Recognition, Data Sets for Pattern Recognition, Different Paradigms for Pattern Recognition. Representation: Data Structures for Pattern Representation, Representation of Clusters, Proximity Measures, Size of Patterns, Abstractions of the Data Set, Feature Extraction, Feature Selection, Evaluation of Classifier, Evaluation of Clustering.

**UNIT: II****NEAREST NEIGHBOR BASED CLASSIFIER****No.of Classes: 09**

**Nearest Neighbor Based Classifier:** Nearest Neighbor Algorithm, Variants of the NN Algorithm use of the Nearest Neighbor Algorithm for Transaction Databases, Efficient Algorithms, Data Reduction, Prototype Selection.

**Bayes Classifier:** Bayes Theorem, Minimum Error Rate Classifier, Estimation of Probabilities, Comparison with the NNC, Naïve Bayes Classifier, Bayesian Belief



Network.

**UNIT: III**

**HIDDEN MARKOV MODELS**

**No.of Classes: 09**

**Hidden Markov Models:** Markov Models for Classification, Hidden Markov Models, Classification using HMMs.

**Decision Trees:** Introduction, Decision Tree for Pattern Classification, Construction of Decision Trees, Splitting at the Nodes, Overfitting and Pruning, Examples of Decision Tree Induction.

**UNIT: IV**

**SUPPORT VECTOR MACHINES**

**No.of Classes: 09**

**Support Vector Machines:** Introduction, Learning the Linear Discriminant Functions, Neural Networks, SVM for Classification.

**Combination of Classifiers:** Introduction, Methods for Constructing Ensembles of Classifiers, Methods for Combining Classifiers.

**UNIT: V**

**CLUSTERING**

**No.of Classes: 09**

**Clustering:** Why is Clustering Important, Hierarchical Algorithms, Partitional Clustering, Clustering Large Data Sets.

**An Application-Hand Written Digit Recognition:** Description of the Digit Data, Preprocessing of Data, Classification Algorithms, Selection of Representative Patterns, Results.

**Text Books:**

1. Pattern Recognition: An Algorithmic Approach: Murty, M. Narasimha, Devi, V. Susheela, Springer Pub, 1st Ed.

**Reference Books:**

1. Machine Learning - Mc Graw Hill, Tom M. Mitchell.
2. Fundamentals Of Speech Recognition: Lawrence Rabiner and Biing- Hwang Juang. Prentice- Hall Pub.

**Web References:**

**E-Text Books:**



**CS505PC: SOFTWARE ENGINEERING LAB****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>CS505PC</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		0	0	3	1.5	30	70	100
<b>Contact Classes: Nil</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: 33</b>			<b>Total Classes: 33</b>			

**Prerequisite:**

1. A course on "Programming for Problem Solving"
2. A Course on "Software Engineering"

**Course Objectives:**

- To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.

**Course Outcomes:**

- Ability to translate end-user requirements into system and software requirements
- Ability to generate a high-level design of the system from the software requirements
- Will have experience and/or awareness of testing problems and will be able to develop a simple testing report.

**List of Experiments**

**Do the following 8 exercises for any two projects given in the list of sample projects or any other projects:**

1. Development of problem statement.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Preparation of Software Configuration Management and Risk Management related documents.
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Develop test cases for unit testing and integration testing
7. Develop test cases for various white box and black box testing techniques.

**Sample Projects:**

1. Passport automation System
2. Book Bank
3. Online Exam Registration
4. Stock Maintenance System
5. Online course reservation system
6. E-ticketing
7. Software Personnel Management System
8. Credit Card Processing
9. E-book management System.
10. Recruitment system

**Text Books:**

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6<sup>th</sup> edition, Mc Graw Hill International Edition.
2. Software Engineering- Sommerville, 7<sup>th</sup> edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

**IT506PC: COMPUTER NETWORKS & WEB PROGRAMMING LAB****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>IT506PC</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		0	0	3	1.5	30	70	100
<b>Contact Classes: Nil</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: 33</b>				<b>Total Classes: 33</b>		

**Prerequisite:** Nil**Course Objectives:**

- To understand the working principle of various communication protocols.
- To understand the network simulator environment and visualize a network topology and observe its performance
- To analyze the traffic flow and the contents of protocol frames

**Course Outcomes:**

- Implement data link layer framing methods
- Analyze error detection and error correction codes.
- Implement and analyze routing and congestion issues in network design.
- Implement Encoding and Decoding techniques used in presentation layer
- To be able to work with different network tools

**List of Experiments**

1. Implement the data link layer framing methods such as character, character-stuffing and bit stuffing.
2. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCIP
3. Develop a simple data link layer that performs the flow control using the sliding window protocol, and loss recovery using the Go-Back-N mechanism.
4. Implement Dijkstra's algorithm to compute the shortest path through a network
5. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
6. Implement distance vector routing algorithm for obtaining routing tables at each node.
7. Implement data encryption and data decryption

8. Write a program for congestion control using Leaky bucket algorithm.

9. Write a program for frame sorting technique used in buffers.

10. Wireshark

i. Packet Capture Using Wire shark

ii. Starting Wire shark

iii. Viewing Captured Traffic

iv. Analysis and Statistics & Filters.

How to run Nmap scan

Operating System Detection using Nmap

Do the following using NS2 Simulator

.NS2 Simulator-Introduction

i. Simulate to Find the Number of Packets Dropped

ii. Simulate to Find the Number of Packets Dropped by TCP/UDP

iii. Simulate to Find the Number of Packets Dropped due to Congestion

iv. Simulate to Compare Data Rate & Throughput.

v. Simulate to Plot Congestion for Different Source/Destination

vi. Simulate to Determine the Performance with respect to Transmission of Packets

### **Web Programming Experiments:**

1. Write a html program for Creation of web site with forms, frames, links, tables etc

2. Develop static pages (using Only HTML) of an online book store. The pages should resemble: [www.amazon.com](http://www.amazon.com). The website should consist the following pages.

- a. Home page
- b. Registration and user Login
- c. User Profile Page
- d. Books catalog
- e. Shopping Cart
- f. Payment By credit card

g. Order Conformation

3. Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

4. Install TOMCAT web server. Convert the static web pages of assignments 1 into dynamic web pages using servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

5. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.

6. Write a PHP script to print prime numbers between 1-50.

7. PHP script to

a. Find the length of a string.

b. Count no of words in a string.

c. Reverse a string.

d. Search for a specific string

8. Write a PHP script to merge two arrays and sort them as numbers, in descending order.

9. Write a PHP script that reads data from one file and write into another file.

10. Create and save an XML document on the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

11. Write a program to implement web service for calculator application

#### **Text Books:**

1. WEB TECHNOLOGIES: A Computer Science Perspective, Jeffrey C. Jackson, Pearson Education

## References:

1. Deitel H.M. and Deitel P.J., "Internet and World Wide Web How to program", Pearson International, 2012, 4th Edition.
2. J2EE: The complete Reference By James Keogh, McGraw-Hill
3. Bai and Ekedhi, The Web Warrior Guide to Web Programming, Thomson
4. Paul Dietel and Harvey Deitel," Java How to Program", Prentice Hall of India, 8<sup>th</sup> Edition
5. Web technologies, Black Book, Dreamtech press.
6. Gopalan N.P. and Akilandeswari J., "Web Technology", Prentice Hall of India



Member Secretary



Chairman

**EN508HS: ADVANCED COMMUNICATION SKILLS LAB****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>EN508HS</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		0	0	2	1	30	70	100
<b>Contact Classes: Nil</b>	<b>Tutorial Classes:</b>	<b>Practical Classes: 33</b>				<b>Total Classes: 33</b>		

**Prerequisite:** Nil**1. INTRODUCTION:**

The introduction of the Advanced Communication Skills Lab is considered essential at 3<sup>rd</sup> year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalized context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

**2. OBJECTIVES:**

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

### 3. SYLLABUS:

The following course content to conduct the activities is prescribed for the Advanced English Communication Skills (AECS) Lab:

1. **Activities on Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language  
  
– Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
2. **Activities on Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading& effective googling.
3. **Activities on Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/Technical report writing/* – planning for writing – improving one's writing.
4. **Activities on Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/ e- mails/assignments etc.
5. **Activities on Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conference and Mock Interviews.

### 4. MINIMUM REQUIREMENT:

The Advanced English Communication Skills (AECS) Laboratory shall have the following infrastructural facilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics.
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality



## 5. SUGGESTED SOFTWARE:

The software consisting of the prescribed topics elaborated above should be procured and used.

- Oxford Advanced Learner's Compass, 7<sup>th</sup> Edition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dream tech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

### Text Books:

1. Effective Technical Communication by M Asharaf Rizvi. McGraw Hill Education (India) Pvt. Ltd. 2<sup>nd</sup> Edition
2. Academic Writing: A Handbook for International Students by Stephen Bailey, Routledge, 5<sup>th</sup> Edition.

### References Books:

1. Learn Correct English – A Book of Grammar, Usage and Composition by Shiv K. Kumar and Hemalatha Nagarajan. Pearson 2007
2. Professional Communication by Aruna Koneru, McGraw Hill Education (India) Pvt. Ltd, 2016.
3. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
4. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. English Vocabulary in Use series, Cambridge University Press 2008.
6. Handbook for Technical Communication by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
7. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
8. Job Hunting by Colm Downes, Cambridge University Press 2008.
9. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill 2009.

### Web References:

### E-Text Books:

**\*MC510: INTELLECTUAL PROPERTY RIGHTS****B.Tech. III Year I Semester**

BBA Fourth Year First Semester										
Course Code	Category	Hours/Week			Credits	Maximum Marks				
*MC510	Elective	L	T	P	C	CIA	SEE	Total		
		3	0	0	0	30	70	100		
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45					
Prerequisite: Nil										
UNIT: I	INTRODUCTION				No.of Classes: 09					
Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.										
UNIT: II	TRADE MARKS				No.of Classes: 09					
Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting, and evaluating trade mark, trade mark registration processes.										
UNIT: III	LAW OF COPY RIGHTS				No.of Classes: 09					
Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law. Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer										
UNIT: IV	TRADE SECRETS				No.of Classes: 09					
Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation. Unfair competition: Misappropriation right of publicity, false advertising.										
UNIT: V	NEW DEVELOPMENT OF INTELLECTUAL PROPERTY				No.of Classes: 09					
New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits. International overview on intellectual property, international – trade mark law, copy right law, international patent law, and international development in trade secrets law.										
Text Books & Reference Books: 1. Intellectual property right, Deborah. E. Bouchoux, Cengage learning. 2. Intellectual property right – Unleashing the knowledge economy, prabuddha ganguli, Tata McGraw Hill Publishing company ltd										
Web References: <a href="https://archive.nptel.ac.in/courses/110/105/110105139/">https://archive.nptel.ac.in/courses/110/105/110105139/</a>										
E-Text Books: <a href="https://www.icsi.edu/media/webmodules/publications/9.4%20Intellectual%20Property%20Rights.pdf">https://www.icsi.edu/media/webmodules/publications/9.4%20Intellectual%20Property%20Rights.pdf</a>										2

**\* MC511: ARTIFICIAL INTELLIGENCE****B.Tech. III Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>*MC511</b>	<b>MC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	0	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:** Nil

**Course Objectives:** To train the students to understand different types of AI agents, various AI search algorithms, fundamentals of knowledge representation, building of simple knowledge-based systems and to apply knowledge representation, reasoning. Study of Markov Models enable the student ready to step into applied AI.

**UNIT: I****No.of Classes: 09**

**Introduction:** AI problems, Agents and Environments, Structure of Agents, Problem Solving Agents

**Basic Search Strategies:** Problem Spaces, Uninformed Search (Breadth-First, Depth-First Search, Depth-first with Iterative Deepening), Heuristic Search (Hill Climbing, Generic Best-First, A\*), Constraint Satisfaction (Backtracking, Local Search)

**UNIT: II****No.of Classes: 09**

**Advanced Search:** Constructing Search Trees, Stochastic Search, A\* Search Implementation, Minimax Search, Alpha-Beta Pruning

**Basic Knowledge Representation and Reasoning:** Propositional Logic, First-Order Logic, Forward Chaining and Backward Chaining, Introduction to Probabilistic Reasoning, Bayes Theorem

**UNIT: III****No.of Classes: 09**

**Advanced Knowledge Representation and Reasoning:** Knowledge Representation Issues, Non-monotonic Reasoning, Other Knowledge Representation Schemes

**Reasoning Under Uncertainty:** Basic probability, Acting Under Uncertainty, Bayes' Rule, Representing Knowledge in an Uncertain Domain, Bayesian Networks

**UNIT: IV****No.of Classes: 09**

**Learning:** What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples, Winston's Learning Program, Decision Trees.

**UNIT: V****No.of Classes: 09**

**Expert Systems:** Representing and Using Domain Knowledge, Shell, Explanation, Knowledge Acquisition.

**Text Books:**

1. Russell, S. and Norvig, P, Artificial Intelligence: A Modern Approach, Third Edition, Prentice-Hall, 2010.

**Reference Books:**

1. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivasankar B. Nair, The McGraw Hill publications, Third Edition, 2009.
2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

**Web References:**

<https://www.mygreatlearning.com/blog/artificial-intelligence-books/>  
<https://nptel.ac.in/courses/106/102/106102220/>



Member Secretary



Chairman