

<b>MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY SEMESTER – V</b>			
Subject Code	17CS51	IA Marks	40
Number of Lecture Hours/Week	4	Exam Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
<b>CREDITS – 04</b>			
<b>Module – 1</b>			<b>Teaching Hours</b>
<b>Introduction</b> – Meaning, nature and characteristics of management, scope and functional areas of management, goals of management, levels of management, brief overview of evolution of management. Planning- Nature, importance, types of plans, steps in planning, Organizing- nature and purpose, types of organization.			<b>10 Hours</b>
<b>Module – 2</b>			
<b>Staffing</b> - meaning, process of recruitment and selection. Directing and controlling- meaning and nature of directing, leadership styles, motivation theories. Controlling- meaning, steps in controlling, methods of establishing control, Communication- Meaning and importance, Coordination- meaning and importance			<b>10 Hours</b>
<b>Module – 3</b>			
<b>Entrepreneur</b> – meaning of entrepreneur, types of entrepreneurship, stages of entrepreneurial process, role of entrepreneurs in economic development, entrepreneurship in India, barriers to entrepreneurship. Identification of business opportunities- market feasibility study, technical feasibility study, financial feasibility study and social feasibility study.			<b>10 Hours</b>
<b>Module – 4</b>			
<b>Preparation of project and ERP</b> - meaning of project, project identification, project selection, project report, need and significance of report, contents, formulation, guidelines by planning commission for project report <b>Enterprise Resource Planning: Meaning and Importance- ERP</b> and Functional areas of Management – Marketing / Sales- Supply Chain Management – Finance and Accounting – Human Resources – Types of reports and methods of report generation			<b>10 Hours</b>
<b>Module – 5</b>			
<b>Micro and Small Enterprises:</b> Definition of micro and small enterprises, characteristics and advantages of micro and small enterprises, steps in establishing micro and small enterprises, Government of India industrial policy 2007 on micro and small enterprises, case study (Microsoft), Case study (Captain G R Gopinath), case study (N R Narayana Murthy & Infosys), <b>Institutional support:</b> MSME-DI, NSIC, SIDBI, KIADB, KSSIDC, TECSOK, KSFC, DIC and District level single window agency, <b>Introduction to IPR.</b>			<b>10 Hours</b>
<b>Course outcomes:</b> The students should be able to:			
<ul style="list-style-type: none"> <li>• Outline the functional areas of management, evolution of management theories and classifying planning, organizing and staffing</li> <li>• Make use of directing and controlling principles in management also identifying the motivational theories and developing leadership styles</li> <li>• Utilize the entrepreneurial types, roles and its characteristics in the Indian business and also identify business opportunities in terms of market, technical, financial and social feasibility</li> <li>• Examine the need of the project. Dissect the significance and content formulation of project report. Classify Enterprise Resource Planning and Supply Chain Management</li> <li>• Classify the characteristics, steps and policies in establishing micro and small enterprises. Examine the case studies, different institutional support and importance of IPR</li> </ul>			

**Question paper pattern:**

The question paper will have TEN questions.

There will be TWO questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer FIVE full questions, selecting ONE full question from each module.

**Text Books:**

1. Principles of Management -P. C. Tripathi, P. N. Reddy; Tata McGraw Hill, 4th / 6<sup>th</sup> Edition, 2010.
2. Dynamics of Entrepreneurial Development & Management -Vasant Desai Himalaya Publishing House.
3. Entrepreneurship Development -Small Business Enterprises -Poornima M Charantimath Pearson Education – 2006.
4. Management and Entrepreneurship- Kanishka Bedi- Oxford University Press-2017

**Reference Books:**

1. Management Fundamentals -Concepts, Application, Skill Development Robert Lusier – Thomson.
2. Entrepreneurship Development -S S Khanka -S Chand & Co.
3. Management -Stephen Robbins -Pearson Education /PHI -17th Edition, 2003

<b>COMPUTER NETWORKS SEMESTER – V</b>			
Subject Code	17CS52	IA Marks	40
Number of Lecture Hours/Week	4	Exam Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
<b>CREDITS – 04</b>			
<b>Module – 1</b>			<b>Teaching Hours</b>
<p><b>Application Layer:</b> Principles of Network Applications: Network Application Architectures, Processes Communicating, Transport Services Available to Applications, Transport Services Provided by the Internet, Application-Layer Protocols. The Web and HTTP: Overview of HTTP, Non-persistent and Persistent Connections, HTTP Message Format, User-Server Interaction: Cookies, Web Caching, The Conditional GET, File Transfer: FTP Commands &amp; Replies, Electronic Mail in the Internet: SMTP, Comparison with HTTP, Mail Message Format, Mail Access Protocols, DNS; The Internet's Directory Service: Services Provided by DNS, Overview of How DNS Works, DNS Records and Messages, Peer-to-Peer Applications: P2P File Distribution, Distributed Hash Tables</p> <p><b>T1: Chap 2</b></p>			<b>10 Hours</b>
<b>Module – 2</b>			
<p><b>Transport Layer :</b> Introduction and Transport-Layer Services: Relationship Between Transport and Network Layers, Overview of the Transport Layer in the Internet, Multiplexing and Demultiplexing: Connectionless Transport: UDP,UDP Segment Structure, UDP Checksum, Principles of Reliable Data Transfer: Building a Reliable Data Transfer Protocol, Pipelined Reliable Data Transfer Protocols, Go-Back-N, Selective repeat, Connection-Oriented Transport TCP: The TCP Connection, TCP Segment Structure, Round-Trip Time Estimation and Timeout, Reliable Data Transfer, Flow Control, TCP Connection Management, Principles of Congestion Control: The Causes and the Costs of Congestion, Approaches to Congestion Control,</p> <p><b>T1: Chap 3</b></p>			<b>10 Hours</b>
<b>Module – 3</b>			
<p><b>The Network layer:</b> What's Inside a Router?: Input Processing, Switching, Output Processing, Where Does Queuing Occur? Routing control plane, IPv6,A Brief foray into IP Security, Routing Algorithms: The Link-State (LS) Routing Algorithm, The Distance-Vector (DV) Routing Algorithm, Hierarchical Routing, Routing in the Internet, Intra-AS Routing in the Internet: RIP, Intra-AS Routing in the Internet: OSPF, Inter/AS Routing: BGP, Broadcast Routing Algorithms and Multicast.</p> <p><b>T1: Chap 4: 4.3-4.7</b></p>			<b>10 Hours</b>
<b>Module – 4</b>			
<p><b>Wireless and Mobile Networks:</b> Cellular Internet Access: An Overview of Cellular Network Architecture, 3G Cellular Data Networks: Extending the Internet to Cellular subscribers, On to 4G:LTE,Mobility management: Principles,</p>			<b>10 Hours</b>

Addressing, Routing to a mobile node, Mobile IP, Managing mobility in cellular Networks, Routing calls to a Mobile user, Handoffs in GSM, Wireless and Mobility: Impact on Higher-layer protocols. <b>T1: Chap: 6 : 6.4-6.8</b>	
<b>Module – 5</b>	
<b>Multimedia Networking:</b> Properties of video, properties of Audio, Types of multimedia Network Applications, Streaming stored video: UDP Streaming, HTTP Streaming, Adaptive streaming and DASH, content distribution Networks, case studies: You Tube. <b>Network Support for Multimedia:</b> Quality-of-Service (QoS) Guarantees: Resource Reservation and Call Admission <b>T1: Chap: 7: 7.1,7.2,7.5</b>	<b>10 Hours</b>
<b>Course outcomes:</b> The students should be able to:	
<ul style="list-style-type: none"> <li>• Able to analyze working of internet protocols at application level communication</li> <li>• Able to differentiate between reliable and unreliable communication and apply this knowledge to build robust applications</li> <li>• Understand IP subnetting and routing protocols</li> <li>• Apply networking knowledge to diagnose network communication and performance issues</li> <li>• Understand wireless networking and mobile communications</li> <li>• Design and implement Network Systems and multimedia applications to meet desired performance needs</li> </ul>	
<p><b>Question paper pattern:</b> The question paper will have TEN questions. There will be TWO questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer FIVE full questions, selecting ONE full question from each module.</p>	
<b>Text Books:</b>	
1. James F Kurose and Keith W Ross, Computer Networking, A Top-Down Approach, Sixth edition, Pearson,2017 .	
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition</li> <li>2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER</li> <li>3. Andrew S Tanenbaum, Computer Networks, fifth edition, Pearson</li> <li>4. Mayank Dave, Computer Networks, Second edition, Cengage Learning</li> </ol>	

<b>DATABASE MANAGEMENT SYSTEM SEMESTER – V</b>			
Subject Code	17CS53	IA Marks	40
Number of Lecture Hours/Week	4	Exam Marks	60
Total Number of Lecture Hours	50	Exam Hours	03
<b>CREDITS – 04</b>			
<b>Module – 1</b>			<b>Teaching Hours</b>
<p><b>Introduction to Databases:</b> Introduction, Characteristics of database approach, Advantages of using the DBMS approach, History of database applications.  <b>Overview of Database Languages and Architectures:</b> Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment. <b>Conceptual Data Modelling using Entities and Relationships:</b> Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, examples, Specialization and Generalization.  <b>Textbook 1: Ch 1.1 to 1.8, 2.1 to 2.6, 3.1 to 3.10</b></p>			<b>10 Hours</b>
<b>Module – 2</b>			
<p><b>Relational Model:</b> Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations. <b>Relational Algebra:</b> Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. <b>Mapping Conceptual Design into a Logical Design:</b> Relational Database Design using ER-to-Relational mapping. <b>SQL:</b> SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, Additional features of SQL.  <b>Textbook 1: Ch4.1 to 4.5, 5.1 to 5.3, 6.1 to 6.5, 8.1; Textbook 2: 3.5</b></p>			<b>10 Hours</b>
<b>Module – 3</b>			
<p><b>SQL : Advances Queries:</b> More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL. <b>Database Application Development:</b> Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Case study: The internet Bookshop. <b>Internet Applications:</b> The three-Tier application architecture, The presentation layer, The Middle Tier  <b>Textbook 1: Ch7.1 to 7.4; Textbook 2: 6.1 to 6.6, 7.5 to 7.7.</b></p>			<b>10 Hours</b>
<b>Module – 4</b>			
<p><b>Normalization: Database Design Theory –</b> Introduction to Normalization using Functional and Multivalued Dependencies: Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.  <b>Normalization Algorithms:</b> Inference Rules, Equivalence, and Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational</p>			<b>10 Hours</b>

Designs, Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms <b>Textbook 1: Ch14.1 to 14.7, 15.1 to 15.6</b>	
<b>Module – 5</b>	
<b>Transaction Processing:</b> Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, Characterizing schedules based on recoverability, Characterizing schedules based on Serializability, Transaction support in SQL. <b>Concurrency Control in Databases:</b> Two-phase locking techniques for Concurrency control, Concurrency control based on Timestamp ordering, Multiversion Concurrency control techniques, Validation Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking. <b>Introduction to Database Recovery Protocols:</b> Recovery Concepts, NO-UNDO/REDO recovery based on Deferred update, Recovery techniques based on immediate update, Shadow paging, Database backup and recovery from catastrophic failures <b>Textbook 1: 20.1 to 20.6, 21.1 to 21.7, 22.1 to 22.4, 22.7.</b>	<b>10 Hours</b>
<b>Course outcomes:</b> The students should be able to:	
<ul style="list-style-type: none"> <li>• Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.</li> <li>• Use Structured Query Language (SQL) for database manipulation.</li> <li>• Design and build simple database systems</li> <li>• Develop application to interact with databases.</li> <li>• Use Transaction processing concepts to handle concurrency control</li> </ul>	
<b>Question paper pattern:</b>	
The question paper will have TEN questions. There will be TWO questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer FIVE full questions, selecting ONE full question from each module.	
<b>Text Books:</b>	
<ol style="list-style-type: none"> <li>1. Fundamentals of Database Systems, RamezElmasri and Shamkant B. Navathe, 7th Edition, 2017, Pearson.</li> <li>2. Database management systems, Ramakrishnan, and Gehrke, 3<sup>rd</sup> Edition, 2014, McGraw Hill</li> </ol>	
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. Silberschatz Korth and Sudharshan, Database System Concepts, 6<sup>th</sup> Edition, McGrawHill, 2013.</li> <li>2. Coronel, Morris, and Rob, Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.</li> </ol>	

**AUTOMATA THEORY AND COMPUTABILITY  
SEMESTER – V**

Subject Code	17CS54	IA Marks	40
Number of Lecture Hours/Week	4	Exam Marks	60
Total Number of Lecture Hours	50	Exam Hours	03

**CREDITS – 04**

<b>Module – 1</b>	<b>Teaching Hours</b>
<p><b>Why study the Theory of Computation, Languages and Strings:</b> Strings, Languages. A Language Hierarchy, Computation, <b>Finite State Machines (FSM):</b> Deterministic FSM, Regular languages, Designing FSM, Nondeterministic FSMs, From FSMs to Operational Systems, Simulators for FSMs, Minimizing FSMs, Canonical form of Regular languages, Finite State Transducers, Bidirectional Transducers.</p> <p><b>Textbook 1: Ch 1,2, 3,4, 5.1 to 5.10</b></p>	<b>10 Hours</b>
<p><b>Module – 2</b></p> <p>Regular Expressions (RE): what is a RE?, Kleene’s theorem, Applications of REs, Manipulating and Simplifying REs. Regular Grammars: Definition, Regular Grammars and Regular languages. Regular Languages (RL) and Non- regular Languages: How many RLs, To show that a language is regular, Closure properties of RLs, to show some languages are not RLs.</p> <p><b>Textbook 1: Ch 6, 7, 8: 6.1 to 6.4, 7.1, 7.2, 8.1 to 8.4</b></p>	<b>10 Hours</b>
<p><b>Module – 3</b></p> <p>Context-Free Grammars(CFG): Introduction to Rewrite Systems and Grammars, CFGs and languages, designing CFGs, simplifying CFGs, proving that a Grammar is correct, Derivation and Parse trees, Ambiguity, Normal Forms. Pushdown Automata (PDA): Definition of non-deterministic PDA, Deterministic and Non-deterministic PDAs, Non-determinism and Halting, alternative equivalent definitions of a PDA, alternatives that are not equivalent to PDA.</p> <p><b>Textbook 1: Ch 11, 12: 11.1 to 11.8, 12.1, 12.2, 12.4, 12.5, 12.6</b></p>	<b>10 Hours</b>
<p><b>Module – 4</b></p> <p>Context-Free and Non-Context-Free Languages: Where do the Context-Free Languages(CFL) fit, Showing a language is context-free, Pumping theorem for CFL, Important closure properties of CFLs, Deterministic CFLs. Algorithms and Decision Procedures for CFLs: Decidable questions, Un-decidable questions. Turing Machine: Turing machine model, Representation, Language acceptability by TM, design of TM, Techniques for TM construction.</p> <p><b>Textbook 1: Ch 13: 13.1 to 13.5, Ch 14: 14.1, 14.2, Textbook 2: Ch 9.1 to 9.6</b></p>	<b>10 Hours</b>
<p><b>Module – 5</b></p> <p>Variants of Turing Machines (TM), The model of Linear Bounded automata: Decidability: Definition of an algorithm, decidability, decidable languages, Undecidable languages, halting problem of TM, Post correspondence problem. Complexity: Growth rate of functions, the classes of P and NP, Quantum Computation: quantum computers, Church-Turing thesis.</p> <p><b>Textbook 2: Ch 9.7 to 9.8, 10.1 to 10.7, 12.1, 12.2, 12.8, 12.8.1, 12.8.2</b></p>	<b>10 Hours</b>

**Course outcomes:** The students should be able to:

- Understand the basic concepts and Apply them in solving formal languages, automata and grammar types, as well as the use of formal languages and reduction in normal forms
- Construct Finite-State Machines-Deterministic Finite-State Automata, Nondeterministic Finite-State Automata.
- Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata.
- Construct push down automata and Turing machines performing tasks of moderate complexity.
- Understand the concepts and Solve Undecidability and Post's Correspondence problem

**Question paper pattern:**

The question paper will have TEN questions.

There will be TWO questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer FIVE full questions, selecting ONE full question from each module.

**Text Books:**

1. Elaine Rich, Automata, Computability and Complexity, 1<sup>st</sup> Edition, Pearson Education, 2012/2013
2. K L P Mishra, N Chandrasekaran , 3<sup>rd</sup> Edition, Theory of Computer Science, PHI, 2012.

**Reference Books:**

1. John E Hopcroft, Rajeev Motwani, Jeffery D Ullman, Introduction to Automata Theory, Languages, and Computation, 3rd Edition, Pearson Education, 2013
2. Michael Sipser : Introduction to the Theory of Computation, 3rd edition, Cengage learning, 2013
3. John C Martin, Introduction to Languages and The Theory of Computation, 3<sup>rd</sup> Edition, Tata McGraw –Hill Publishing Company Limited, 2013
4. Peter Linz, “An Introduction to Formal Languages and Automata”, 3rd Edition, Narosa Publishers, 1998
5. Basavaraj S. Anami, Karibasappa K G, Formal Languages and Automata theory, Wiley India, 2012
6. C K Nagpal, Formal Languages and Automata Theory, Oxford University press, 2012.



<b>ADVANCED JAVA AND J2EE SEMESTER – V</b>			
Subject Code	17CS553	IA Marks	40
Number of Lecture Hours/Week	3	Exam Marks	60
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 03</b>			
<b>Module – 1</b>			<b>Teaching Hours</b>
<b>Enumerations, Autoboxing and Annotations(metadata):</b> Enumerations, Enumeration fundamentals, the values() and valueOf() Methods, java enumerations are class types, enumerations Inherits Enum, example, type wrappers, Autoboxing, Autoboxing and Methods, Autoboxing/Unboxing occurs in Expressions, Autoboxing/Unboxing, Boolean and character values, Autoboxing/Unboxing helps prevent errors, A word of Warning. Annotations, Annotation basics, specifying retention policy, Obtaining Annotations at run time by use of reflection, Annotated element Interface, Using Default values, Marker Annotations, Single Member annotations, Built-In annotations.			<b>8 Hours</b>
<b>Module – 2</b>			
<b>The collections and Framework:</b> Collections Overview, Recent Changes to Collections, The Collection Interfaces, The Collection Classes, Accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working With Maps, Comparators, The Collection Algorithms, Why Generic Collections?, The- legacy Classes and Interfaces, Parting Thoughts on Collections.			<b>8 Hours</b>
<b>Module – 3</b>			
<b>String Handling :</b> The String Constructors, String Length, Special String Operations, String Literals, String Concatenation, String Concatenation with Other Data Types, String Conversion and toString( ) Character Extraction, charAt( ), getChars( ), getBytes( ) toCharArray(), String Comparison, equals( ) and equalsIgnoreCase( ), regionMatches( ) startsWith( ) and endsWith( ), equals( ) Versus == , compareTo( ) Searching Strings, Modifying a String, substring( ), concat( ), replace( ), trim( ), Data Conversion Using valueOf( ), Changing the Case of Characters Within a String, Additional String Methods, StringBuffer , StringBuffer Constructors, length( ) and capacity( ), ensureCapacity( ), setLength( ), charAt( ) and setCharAt( ), getChars( ),append( ), insert( ), reverse( ), delete( ) and deleteCharAt( ), replace( ), substring( ), Additional StringBuffer Methods, StringBuilder			<b>8 Hours</b>
<b>Text Book 1: Ch 15</b>			
<b>Module – 4</b>			
Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking. Java Server Pages (JSP): JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects			<b>8 Hours</b>

<b>Text Book 1: Ch 31 Text Book 2: Ch 11</b>	
<b>Module – 5</b>	
The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions. <b>Text Book 2: Ch 06</b>	<b>8 Hours</b>
<b>Course outcomes:</b> The students should be able to:	
<ul style="list-style-type: none"> <li>• Interpret the need for advanced Java concepts like enumerations, auto boxing-unboxing and annotations, in developing concise and efficient programs</li> <li>• Make use of Java Collection framework to manipulates the group of objects, to build concise and efficient programs</li> <li>• Make use of String, StringBuffer and StringBuilder Classes to handle mutable and modifiable strings</li> <li>• Make use of servlets and Java Server Pages (JSP) to generate static and dynamic web pages, to store client information using cookies and sessions.</li> <li>• Demonstrate the use of JDBC to access database through Java applications and servlets.</li> </ul>	
<p><b>Question paper pattern:</b>  The question paper will have TEN questions.  There will be TWO questions from each module.  Each question will have questions covering all the topics under a module.  The students will have to answer FIVE full questions, selecting ONE full question from each module.</p>	
<p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Herbert Schildt: JAVA the Complete Reference, 7<sup>th</sup>/9th Edition, Tata McGraw Hill, 2007.</li> <li>2. Jim Keogh: J2EE-TheCompleteReference, McGraw Hill, 2007.</li> </ol>	
<p><b>Reference Books:</b></p> <ol style="list-style-type: none"> <li>1. Y. Daniel Liang: Introduction to JAVA Programming, 7<sup>th</sup>Edition, Pearson Education, 2007.</li> <li>2. Stephanie Bodoff et al: The J2EE Tutorial, 2<sup>nd</sup> Edition, Pearson Education,2004.</li> <li>3. Uttam K Roy, Advanced JAVA programming, Oxford University press, 2015.</li> </ol>	

<b>ARTIFICIAL INTELLIGENCE</b> <b>[As per Choice Based Credit System (CBCS) scheme]</b> <b>(Effective from the academic year 2017 -2018)</b> <b>SEMESTER – V</b>			
Subject Code	17CS562	IA Marks	40
Number of Lecture Hours/Week	3	Exam Marks	60
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 03</b>			
<b>Module – 1</b>			<b>Teaching Hours</b>
What is artificial intelligence?, Problems, Problem Spaces and search, Heuristic search technique <b>TextBook1: Ch 1, 2 and 3</b>			<b>8 Hours</b>
<b>Module – 2</b>			
<b>Knowledge Representation Issues, Using Predicate Logic, Representing knowledge using Rules,</b> <b>TextBook1: Ch 4, 5 and 6.</b>			<b>8 Hours</b>
<b>Module – 3</b>			
Symbolic Reasoning under Uncertainty, Statistical reasoning, Weak Slot and Filter Structures. <b>TextBook1: Ch 7, 8 and 9.</b>			<b>8 Hours</b>
<b>Module – 4</b>			
Strong slot-and-filler structures, Game Playing. <b>TextBook1: Ch 10 and 12</b>			<b>8 Hours</b>
<b>Module – 5</b>			
Natural Language Processing, Learning, Expert Systems. <b>TextBook1: Ch 15,17 and 20</b>			<b>8 Hours</b>
<b>Course outcomes:</b> The students should be able to: <ul style="list-style-type: none"> <li>• Summarize key components of AI field and its relation and role in Computer Science.</li> <li>• Utilize given AI technique to solve concrete problem and also to implement nontrivial AI technique.</li> <li>• Design various symbolic knowledge representations to specify domain and reasoning agent.</li> <li>• Identify AI problem based on characteristics ,constraints and compare various learning techniques.</li> <li>• Make use of different logic formalism and decision taking in planning problem.</li> </ul>			
<b>Question paper pattern:</b> The question paper will have TEN questions. There will be TWO questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer FIVE full questions, selecting ONE full question from each module.			
<b>Text Books:</b>			
1. E. Rich , K. Knight & S. B. Nair - Artificial Intelligence, 3/e, McGraw Hill.			
<b>Reference Books:</b>			

1. Artificial Intelligence: A Modern Approach, Stuart Russell, Peter Norving, Pearson Education 2nd Edition.
1. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems – Prentice Hal of India.
2. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem

Solving”, Fourth Edition, Pearson Education, 2002.

3. Artificial Intelligence and Expert Systems Development by D W Rolston-Mc Graw hill.
4. N.P. Padhy “Artificial Intelligence and Intelligent Systems” , Oxford University Press-2015

<b>DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT SEMESTER – V</b>			
Subject Code	17CS564	IA Marks	40
Number of Lecture Hours/Week	3	Exam Marks	60
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 03</b>			
<b>Module – 1</b>			<b>Teaching Hours</b>
<b>Introducing Microsoft Visual C# and Microsoft Visual Studio 2015:</b> Welcome to C#, Working with variables, operators and expressions, Writing methods and applying scope, Using decision statements, Using compound assignment and iteration statements, Managing errors and exceptions <b>T1: Chapter 1 – Chapter 6</b>			<b>8 Hours</b>
<b>Module – 2</b>			
<b>Understanding the C# object model:</b> Creating and Managing classes and objects, Understanding values and references, Creating value types with enumerations and structures, Using arrays <b>Textbook 1: Ch 7 to 10</b>			<b>8 Hours</b>
<b>Module – 3</b>			
Understanding parameter arrays, Working with inheritance, Creating interfaces and defining abstract classes, Using garbage collection and resource management <b>Textbook 1: Ch 11 to 14</b>			<b>8 Hours</b>
<b>Module – 4</b>			
<b>Defining Extensible Types with C#:</b> Implementing properties to access fields, Using indexers, Introducing generics, Using collections <b>Textbook 1: Ch 15 to 18</b>			<b>8 Hours</b>
<b>Module – 5</b>			
Enumerating Collections, Decoupling application logic and handling events, Querying in-memory data by using query expressions, Operator overloading <b>Textbook 1: Ch 19 to 22</b>			<b>8 Hours</b>
<b>Course outcomes:</b> The students should be able to:			
<ul style="list-style-type: none"> <li>• Build the applications on Visual Studio .NET platform by understanding the syntax and semantics of C#</li> <li>• Utilize the concepts of classes and objects and also create value types with enumerations and structures.</li> <li>• Apply the concepts of inheritance, interfaces and garbage collection.</li> <li>• Build custom collections and generics in C#</li> <li>• Construct events and query data using query expressions</li> </ul>			
<b>Question paper pattern:</b>			
The question paper will have TEN questions. There will be TWO questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer FIVE full questions, selecting ONE full question from each module.			
<b>Text Books:</b>			

1. John Sharp, Microsoft Visual C# Step by Step, 8<sup>th</sup> Edition, PHI Learning Pvt. Ltd. 2016

**Reference Books:**

1. Christian Nagel, "C# 6 and .NET Core 1.0", 1st Edition, Wiley India Pvt Ltd, 2016.  
Andrew Stellman and Jennifer Greene, "Head First C#", 3rd Edition, O'Reilly Publications, 2013.
2. Mark Michaelis, "Essential C# 6.0", 5th Edition, Pearson Education India, 2016.
3. Andrew Troelsen, "Prof C# 5.0 and the .NET 4.5 Framework", 6th Edition, Apress and Dreamtech Press, 2012.

<b>COMPUTER NETWORK LABORATORY</b>			
<b>SEMESTER – V</b>			
Subject Code	17CSL57	IA Marks	40
Number of Lecture Hours/Week	01I + 02P	Exam Marks	60
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 02</b>			
<b>Description (If any):</b>			
For the experiments below modify the topology and parameters set for the experiment and take multiple rounds of reading and analyze the results available in log files. Plot necessary graphs and conclude. Use NS2/NS3.			
<b>Lab Experiments:</b>			
<b>PART A</b>			
<ol style="list-style-type: none"> <li>1. Implement three nodes point – to – point network with duplex links between them. Set the queue size, vary the bandwidth and find the number of packets dropped.</li> <li>2. Implement transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.</li> <li>3. Implement an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination.</li> <li>4. Implement simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the performance with respect to transmission of packets.</li> <li>5. Implement and study the performance of GSM on NS2/NS3 (Using MAC layer) or equivalent environment.</li> <li>6. Implement and study the performance of CDMA on NS2/NS3 (Using stack called Call net) or equivalent environment.</li> </ol>			
<b>PART B</b>			
<b>Implement the following in Java:</b>			
<ol style="list-style-type: none"> <li>7. Write a program for error detecting code using CRC-CCITT (16- bits).</li> <li>8. Write a program to find the shortest path between vertices using bellman-ford algorithm.</li> <li>9. Using TCP/IP sockets, write a client – server program to make the client send the file name and to make the server send back the contents of the requested file if present.</li> <li>10. Write a program on datagram socket for client/server to display the messages on client side, typed at the server side.</li> <li>11. Write a program for simple RSA algorithm to encrypt and decrypt the data.</li> <li>12. Write a program for congestion control using leaky bucket algorithm.</li> </ol>			
<b>Study Experiment / Project:</b>			
<b>NIL</b>			
<b>Course outcomes:</b> The students should be able to:			
<ul style="list-style-type: none"> <li>• Utilize socket program using TCP &amp; UDP</li> <li>• Develop security algorithm to provide network security</li> <li>• Make use of CRC to develop the code for Data link layer protocol</li> <li>• Develop the performances of Routing protocol</li> <li>• Build Wired and Wireless network using network simulator</li> </ul>			



**Conduction of Practical Examination:**

1. All laboratory experiments are to be included for practical examination.
2. Students are allowed to pick one experiment from part A and part B with lot.
3. Strictly follow the instructions as printed on the cover page of answer script
4. Marks distribution: Procedure + Conduction + Viva: 100

Part A: **8+35+7 =50**

Part B: **8+35+7 =50**

5. Change of experiment is allowed only once and marks allotted to the procedure part to be made zero.

<b>DBMS LABORATORY WITH MINI PROJECT SEMESTER – V</b>			
Subject Code	17CSL58	IA Marks	40
Number of Lecture Hours/Week	01I + 02P	Exam Marks	60
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 02</b>			
<b>Description (If any):</b>			
<p><b>PART-A: SQL Programming (Max. Exam Mks. 50)</b></p> <ul style="list-style-type: none"> <li>• Design, develop, and implement the specified queries for the following problems using Oracle, MySQL, MS SQL Server, or any other DBMS under LINUX/Windows environment.</li> <li>• Create Schema and insert at least 5 records for each table. Add appropriate database constraints.</li> </ul> <p><b>PART-B: Mini Project (Max. Exam Mks. 30)</b></p> <ul style="list-style-type: none"> <li>• Use Java, C#, PHP, Python, or any other similar front-end tool. All applications must be demonstrated on desktop/laptop as a stand-alone or web based application (Mobile apps on Android/IOS are not permitted.)</li> </ul>			
<b>Lab Experiments:</b>			
<b>Part A: SQL Programming</b>			
<b>1</b>	<p>Consider the following schema for a Library Database:            BOOK(Book_id, Title, Publisher_Name, Pub_Year)            BOOK_AUTHORS(Book_id, Author_Name)            PUBLISHER(Name, Address, Phone)            BOOK_COPIES(Book_id, Branch_id, No-of_Copies)            BOOK_LENDING(Book_id, Branch_id, Card_No, Date_Out, Due_Date)            LIBRARY_BRANCH(Branch_id, Branch_Name, Address)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc.</li> <li>2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.</li> <li>3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.</li> <li>4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.</li> <li>5. Create a view of all books and its number of copies that are currently available in the Library.</li> </ol>		
<b>2</b>	<p>Consider the following schema for Order Database:            SALESMAN(Salesman_id, Name, City, Commission)            CUSTOMER(Customer_id, Cust_Name, City, Grade, Salesman_id)            ORDERS(Ord_No, Purchase_Amt, Ord_Date, Customer_id, Salesman_id)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>1. Count the customers with grades above Bangalore's average.</li> <li>2. Find the name and numbers of all salesman who had more than one customer.</li> <li>3. List all the salesman and indicate those who have and don't have customers in their cities (Use UNION operation.)</li> </ol>		

	<p>4. Create a view that finds the salesman who has the customer with the highest order of a day.</p> <p>5. Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted.</p>
3	<p>Consider the schema for Movie Database:          ACTOR(<u>Act_id</u>, Act_Name, Act_Gender)          DIRECTOR(<u>Dir_id</u>, Dir_Name, Dir_Phone)          MOVIES(<u>Mov_id</u>, Mov_Title, Mov_Year, Mov_Lang, Dir_id)          MOVIE_CAST(<u>Act_id</u>, <u>Mov_id</u>, Role)          RATING(<u>Mov_id</u>, Rev_Stars)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>List the titles of all movies directed by 'Hitchcock'.</li> <li>Find the movie names where one or more actors acted in two or more movies.</li> <li>List all actors who acted in a movie before 2000 and also in a movie after 2015 (use JOIN operation).</li> <li>Find the title of movies and number of stars for each movie that has at least one rating and find the highest number of stars that movie received. Sort the result by movie title.</li> <li>Update rating of all movies directed by 'Steven Spielberg' to 5.</li> </ol>
4	<p>Consider the schema for College Database:          STUDENT(<u>USN</u>, SName, Address, Phone, Gender)          SEMSEC(<u>SSID</u>, Sem, Sec)          CLASS(<u>USN</u>, <u>SSID</u>)          SUBJECT(<u>Subcode</u>, Title, Sem, Credits)          IAMARKS(<u>USN</u>, <u>Subcode</u>, <u>SSID</u>, Test1, Test2, Test3, FinalIA)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>List all the student details studying in fourth semester 'C' section.</li> <li>Compute the total number of male and female students in each semester and in each section.</li> <li>Create a view of Test1 marks of student USN '1BI17CS101' in all subjects.</li> <li>Calculate the FinalIA (average of best two test marks) and update the corresponding table for all students.</li> <li>Categorize students based on the following criterion:              If FinalIA = 17 to 20 then CAT = 'Outstanding'              If FinalIA = 12 to 16 then CAT = 'Average'              If FinalIA &lt; 12 then CAT = 'Weak'              Give these details only for 8<sup>th</sup> semester A, B, and C section students.</li> </ol>
5	<p>Consider the schema for Company Database:          EMPLOYEE(<u>SSN</u>, Name, Address, Sex, Salary, SuperSSN, DNo)          DEPARTMENT(<u>DNo</u>, DName, MgrSSN, MgrStartDate)          DLOCATION(<u>DNo</u>, <u>DLoc</u>)          PROJECT(<u>PNo</u>, PName, PLocation, DNo)          WORKS_ON(<u>SSN</u>, <u>PNo</u>, Hours)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.</li> <li>Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.</li> <li>Find the sum of the salaries of all employees of the 'Accounts' department, as</li> </ol>

	<p>well as the maximum salary, the minimum salary, and the average salary in this department</p> <ol style="list-style-type: none"> <li>4. Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator).</li> <li>5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.</li> </ol>
<p><b>Part B: Mini project</b></p>	
<ul style="list-style-type: none"> <li>• For any problem selected, write the ER Diagram, apply ER-mapping rules, normalize the relations, and follow the application development process.</li> <li>• Make sure that the application should have five or more tables, at least one trigger and one stored procedure, using suitable frontend tool.</li> <li>• Indicative areas include; health care, education, industry, transport, supply chain, etc.</li> </ul>	
<p><b>Course outcomes:</b> The students should be able to:</p>	
<ul style="list-style-type: none"> <li>• Construct tables with different data types and without constraints.</li> <li>• Experiment with SQL DML/DDL commands querying a table once it is populated.</li> <li>• Build SQL queries to extract the data from more than 1 table.</li> <li>• Create multiple tables by properly specifying the primary keys and the foreign keys to demonstrate on-delete-cascade and on-update-cascade concepts.</li> <li>• Develop database management real-world application for the societal need.</li> </ul>	
<p><b>Conduction of Practical Examination:</b></p> <ol style="list-style-type: none"> <li>1. All laboratory experiments from part A are to be included for practical examination.</li> <li>2. Mini project has to be evaluated for 40 Marks.</li> <li>3. Report should be prepared in a standard format prescribed for project work.</li> <li>4. Students are allowed to pick one experiment from the lot.</li> <li>5. Strictly follow the instructions as printed on the cover page of answer script.</li> <li>6. Marks distribution: <ol style="list-style-type: none"> <li>a) Part A: Procedure + Conduction + Viva: <b>09 + 42 + 09 = 60 Marks</b></li> <li>b) Part B: Demonstration + Report + Viva voce = <b>20+14+06 = 40 Marks</b></li> </ol> </li> <li>7. Change of experiment is allowed only once and marks allotted to the procedure part to be made zero.</li> </ol>	