

KURUKSHETRA UNIVERSITY, KURUKSHETRA

Bachelor of Technology (Information Technology) SCHEME OF STUDIES / EXAMINATIONS

Semester – VII (w.e.f Session 2018-19)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/Week	Theory	Sessional	Practical	Total	
1.	IT-401N	Compiler Design	4	1	--	5	75	25	--	100	3
2.	IT-403N	Artificial Intelligence	4	1	--	5	75	25	--	100	3
3.	IT-405 N	Fundamentals of Entrepreneurship	4	1	--	5	75	25	--	100	3
4.	DEC-1	Elective-1**	4	1	--	5	75	25	--	100	3
5.	DEC-2	Elective-2**	4	1	--	5	75	25	--	100	3
6.	IT-407N	Server Side Programming Lab	--	--	3	3	---	40	60	100	3
7.	IT-409 N	Mobile Application Development Lab	--	--	3	3	---	40	60	100	3
8.	IT-411 N	Project I #	---	--	3	3	--	40	60	100	3
9.	IT-413 N	Industrial Training (Viva-Voce)##	--	--	--	--		50		50	
Total			20	6	09	34	375	295	180	850	

Note: Industrial Training which was undergone by the students after VI sem is to be evaluated during VII sem as **(IT-413N)** through submission of certified computerized report to the Head of the Department followed by viva-voce, seminar / presentation / demo etc.

#The project should be initiated by the students in the beginning of VII^h semester and will be evaluated at the end of the semester on the basis of a presentation , viva , demo , report etc.

**** Student should select two Departmental Elective Course (DEC) from the following list:-**

Departmental Elective Courses			
Course No.	DEC-1	Course No.	DEC-2
IT-415 N	Advanced Computer Network	IT-421 N	Software Testing
IT-417 N	Introduction to computer animation	IT-423 N	Software Project management
IT-419 N	Simulation and Modeling	IT-425 N	Distributed Operating System

KURUKSHETRA UNIVERSITY, KURUKSHETRA

Bachelor of Technology (Information Technology) SCHEME OF STUDIES / EXAMINATIONS

Semester – VIII (w.e.f Session 2018-19)

S. No.	Course No.	Course Title	Teaching Schedule				Allotment of Marks				Duration of Exam (Hrs.)
			L	T	P	Hours/Week	Theory	Sessional	Practical	Total	
1.	IT-402N	Mobile Communication	4	1	-	5	75	25	--	100	3
2.	IT-404N	Advanced Database System	4	1	-	5	75	25	--	100	3
3.	IT-406N	Information Security	4	1	--	5	75	25	--	100	3
4.	DEC-3	Elective-3 *	4	1	--	5	75	25	--	100	3
5.	DEC-4	Elective-4 *	4	1	--	5	75	25	--	100	3
6.	IT-408 N	Mobile Communication Lab	---	--	3	3	---	40	60	100	3
7.	IT-410N	Python Programming Lab	---	--	3	3	---	40	60	100	3
8.	IT-412 N	Project II	--	--	3	3	---	40	60	100	3
9.	IT-414 N	Comprehensive Viva ^{##}	--	--	--	--	---	25	--	25	--
10	IT-416 N	General Fitness & Professional Aptitude ^{**}	--	--	--	--	---	--	25	25	--
Total			20	5	09	34	375	270	205	850	

^{##} IT-414 N (Comprehensive Viva) Marks will be based on student's Technical knowledge , professional aptitude, GK , current affairs, logical / analytic reasoning etc. Each student will be evaluated by a team comprising of at least 03 senior faculty members of the department.

^{**} IT-416 N (General Fitness & Professional Aptitude) : To be examined by an external and internal examiner at the rank of the Director / Principal / Senior faculty member of department. Marks on the basis of student's Technical knowledge , professional aptitude, GK , current affairs, logical / analytic reasoning etc.

* The student should select two Departmental Elective Courses (DEC) from the following list:-

Departmental Elective Courses			
Course No.	DEC-3	Course No.	DEC-4
IT- 418 N	Cloud Computing	IT- 424 N	Expert system
IT- 420 N	Introduction to Internet of Things	IT- 426 N	Big Data and Analytic
IT- 422N	Image Processing	IT- 428 N	Object Oriented Software Engineering

Semester VII

IT-401 N	Compiler Design					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiarize the students to design and implement a compiler.					
Course						
CO 1	To understand, design and implement a lexical analyzer.					
CO 2	To understand, design and implement a parser.					
CO 3	To understand, design code generation schemes.					
CO 4	To understand optimization of codes and runtime environment					

UNIT I

Introduction to Compiling

Analysis of the source program, Phases of a compiler, Grouping of Phases, Compiler construction tools.

Lexical Analysis –Regular Expression, Introduction to Finite Automata and Regular Expression, Conversion of Regular Expression to NFA, Role of Lexical Analyzer, Input Buffering, Specification of Tokens.

UNIT II

Syntax Analysis

Role of the Parser, Writing Grammars, Symbol Table, Context-Free Grammars, Shift-reduce Parser, Operator Precedence Parsing, Top Down Parsing, Predictive Parsers, LR Parsers: SLR Parser, Canonical LR Parser, LALR Parser, Implementation of LR Parsing Tables.

UNIT III

Intermediate Code Generation and Code

Intermediate languages, Declarations, Assignment Statements, Boolean Expressions, Case Statements, DAG representation of Basic Blocks, A simple Code generator from DAG, Issues in the design of code generator, The target machine, Runtime Storage management, Error Handling- Type checking,

UNIT IV

Code Optimization and Run Time Environments

Principal Sources of Optimization, Optimization of Basic Blocks, Peephole Optimization, Introduction to Global Data Flow Analysis, Source Language issues, Storage Organization, Static Storage Management, Heap Storage management, Access to non-Local Names, Parameter Passing.

Text books

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.
2. Kenneth C. Loudon, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

Reference books

1. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
3. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.
4. HenkAlblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-403 N Artificial Intelligence						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	The purpose of this course is to introduce students the basic research areas in artificial intelligence					
Course Outcomes						
CO 1	To study various AI problems and techniques.					
CO 2	To study knowledge representation methods.					
CO 3	To study certainty and uncertainty based reasonings.					
CO 4	To study the basic concepts of fuzzy, neural nets & natural language processing.					

Unit-1

Introduction –foundation and history of AI:, Classical, Romantic and Modern period, Applications of AI.

Production System: - Production rules, the working memory, Recognize-act cycle, conflict resolution strategies, refactoriness, Regency, specificity, alternative approach for conflict resolution, Architecture of production system, Types of Production systems, conclusion

Unit –2

Propositional Logic: - Proposition, tautologies, Theorem proving in propositional logic, Semantic method of Theorem proving, forward chaining, backward chaining, standard theorems in propositional logic, method of substitution, theorem proving using Wang’s algorithm, conclusion.

Predicate Logic: - Alphabet of First order logic (FOL), predicate, well formed formula, clause form, algorithm for writing sentence into clause form, inflict of predicates, unification algorithm, resolution Robinson’s inference rule, conclusion

Unit – 3

Logic Programming and Prolog: - Logic program, Horn clause, program for scene interpretation, unification of goals, definite perform clause, SLD resolution, SLD tree, controlling back tracking, common use of cut, implementation of backtracking using stack, risk of using cuts, fail predicate, application of cut-fail combination, replace cut-fail by not, conclusion.

Default & Non monotonic reasoning: - Axiomatic theory, non-atomic reasoning using NML-I, problems with NML-I, reasoning with NML-II, truth maintenance system with example, conclusion

Unit – 4

Imprecision & Uncertainty: - Definition, Probabilistic technicians, Fuzzy reasoning, certainty factor based reasoning conditional probability, Baye’s Theorem and its limitations, Bayesian belief network, propagation of belief, Dampster-Shafer theory of uncertainty management, Types of Learning, Introduction to Genetic algorithm

Intelligent Search Technique: - Heuristic function, AND-OR graph, Heuristic search, A* algorithm and examples.

Text Books

1. Elain Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill, New Delhi.
2. Staurt Russel and other Peter Norvig, “Artificial Intelligence – a Modern Approach”, Prentice Hall.

Reference Books.:

1. Patrick Henry Winston, “Artificial Intelligence”, Addison Wesley, third Ed.
2. Artificial Intelligence & Expert System By Patterson – PHI.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 405 N	Fundamentals of Entrepreneurship					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The purpose of this course is to introduce students the basics of Entrepreneurship					
	Course Outcome					
CO 1	Students will be able understand who the entrepreneurs are and what competences needed to become an Entrepreneur.					
CO 2	Students will be able understand insights into the management, opportunity search, identification of a Product; market feasibility studies; project finalization etc. required for small business enterprises.					
CO 3	Students can be able to write a report and do oral presentation on the topics such as product identification, business idea, export marketing etc.					
CO 4	Students be able to know the different financial and other assistance available for the establishing small industrial units.					

Unit -I

Entrepreneurship: Concept and Definitions; Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; EDP Programmes; Entrepreneurial Training; Traits/Qualities of an Entrepreneurs; Entrepreneur; Manager Vs. Entrepreneur.

Unit -II

Opportunity / Identification and Product Selection: Entrepreneurial Opportunity Search and Identification; Criteria to Select a Product; Conducting Feasibility Studies; Project Finalization; Sources of Information.

Unit -III

Small Enterprises and Enterprise Launching Formalities : Definition of Small Scale; Rationale; Objective; Scope; Role of SSI in Economic Development of India; SSI; Registration; NOC from Pollution Board; Machinery and Equipment Selection; Project Report Preparation; Specimen of Project Report; Project Planning and Scheduling using Networking Techniques of PERT / CPM; Methods of Project Appraisal.

Unit -IV

Role of Support Institutions and Management of Small Business : Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC; Marketing Management; Production Management; Finance Management; Human Resource Management; Export Marketing; Case Studies-At least one in whole course.

Text Books:

1. Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi -Desai, Vasant, 2003.
2. Entrepreneurship Management -Cynthia, Kaulgud, Aruna, Vikas Publishing House, Delhi, 2003.

Reference Books:

1. Entrepreneurship Ideas in Action- L. Greene, Thomson Asia Pvt. Ltd., Singapore, 2004.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-415 N	Advanced Computer Networks					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiarize different protocols & applications of computer networks.					
Course						
CO 1	To study MAC protocols for High speed networks.					
CO 2	To study IPv6 addressing schemes.					
CO 3	To study wireless application protocol for communication.					
CO 4	To study the concepts to manage networks.					

UNIT – 1

Introduction: Overview of computer networks, seven-layer architecture, TCP/IP suite of protocols, etc. MAC protocols for high-speed LANS, MANs, and wireless LANs. (For example, FDDI, DQDB, HIPPI, Gigabit Ethernet, Wireless Ethernet, etc.)

UNIT-2

Fast access technologies (For example, ADSL, Cable Modem, etc.).

Overview of IPv6, IPv6 & TCP/IP stack, IPv6 protocol architecture, IPv6 address basics, address notation, unicast address, multicast address, IPv6 headers, Routing table problem, static & automatic address configuration, neighbor discovery, stateless address auto configuration, Interoperation concepts of IPv4/IPv6.

UNIT-3

Mobility in networks, Mobile IP. Security related issues in mobile IP. IP Multicasting. Multicast protocols, address assignments, session discovery, etc.

Network security at various layers. Secure-HTTP, SSL, ESP, Authentication header, Key, distribution protocols. Digital signatures, digital certificates.

UNIT-4

The Wireless Applications Protocols, applications environment, wireless application protocol client software, wireless application protocol gateways, implementing enterprise wireless application protocol strategy and Security Issues in Wireless LAN. Wireless network management, GPRS, and VOIP services.

Network Management: Introduction, LAN, SNMP, and CMIP. Issues in the management of large networks. Multicast: IGMP, PIM, DVMRP

Text Books:

1. W.R. Stevens. TCP/IP Illustrated, Volume 1: The protocols, Addison Wesley, 1994.
2. G.R. Wright. TCP/IP Illustrated, Volume 2: The Implementation, Addison Wesley, 1995.

References Books:

1. W.R. Stevens. TCP/IP Illustrated, Volume 3: TCP for Transactions, HTTP, NNTP, and the Unix Domain Protocols, Addison Wesley, 1996.
2. R. Handel, M.N. Huber, and S. Schroeder. ATM Networks. Concepts, protocols, Applications, Addison Wesley, 1998.
3. William Stalling, Wireless Communications and Networks. Prentice Hall 2002

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 417 N						
Introduction to Computer Animation						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To introduce the student to the concepts of Animation					
	Course outcomes					
CO 1	To study various Production Pipeline Components of animation					
CO 2	To introduce the students to Pre-visualization Techniques , Modeling , Texturing					
CO 3	To study Rigging and Rendering					
CO 4	To learn about the various animation techniques.					

Unit 1

Introduction: Defining 3D animation , Exploring 3D animation industry , history of animation, Understanding Production Pipeline Components : Animation preproduction , Animation production , Animation Postproduction

Unit 2

Exploring Animation, Story, and Pre-visualization : Using Principles of Fine Art and Traditional Animation : Modeling , Texturing / lighting, Character animation ; Building a good story : Story Arc, Character goal & conflict , , Storytelling Principles , ; Pre-visualization Techniques : Basic Shot Framing , camera movements , editing ; **Modeling :** Polygons , NURBS , Subdivision surfaces , modeling workflows
Texturing : UVs , shaders , Texture maps , Texturing workflows

Unit 3

Rigging : Parenting , Pivot Position , Skelton system , Forward & Inverse kinematics , Deformers, Constraints , Scripting , expressions , Basic Rigging workflow
Animation : Keyframe , Graph editor, timeline, Dope sheet , Workspace , animation workflow
Visual effects : Particles , Hair & Fur , Fluids , Rigid bodies , Soft bodies ; **Lighting :** Types , Light attributes , lighting techniques ; **Rendering :** Basic method , global illumination ; Creating Stereoscopic 3D ; Providing Real-Time Capabilities

Unit 4

Animation techniques : Interpolation and Basic Techniques: controlling the motion along a curve, Path following, key frames , Animation languages, deforming objects , Morphing, 3Dshape interpolation ; **Natural Phenomena:** Plants , water, Gaseous Phenomena , **Modeling and Animating Articulated Figures**

Text book :

1. Andy Beane , “3D Animation essentials” , John Wiley & sons , 2012.
2. Rick Parent, “Computer Animation: Algorithms and Techniques” , Morgan Kaufmann Publishers, 2012,
3. Nicholas Bernhardt Zeman , “Essential Skills for 3D Modeling, Rendering and Animation” , CRC press , 2015

Reference Book

1. Donald Hearn & M. Pauline Baker , WarrenCarithers, “Computer Graphics With OpenGL” , 4thEdition, Pearson Education, 2010, ISBN: 0-13-015390-7
2. John F. Hughes, Andries van Dam , “Computer Graphics: Principles and Practice” Addison-Wesley Professional, 3rdEdition, 2013, ISBN: 978-0-321-39952-6

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-419 N	Simulation and Modeling					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To introduce the principles and paradigms of Computer Modeling and Simulation for solving a wide variety of problems.					
Course Outcomes						
CO 1	Learn the basic concept of System, system modeling, types of model, simulation and					
CO 2	Learn the simulation of contiguous and discrete system with the help of different					
CO 3	Learn the concept of generation of uniformly and non-uniformly distribution random					
CO 4	Learn the simulation of queuing system.					

UNIT-1

Modeling: System Concepts, system boundaries and environment, continuous and discrete systems, system modeling, Types of Models, Model validation, Principles & Nature of Computer modeling.

Simulation: Introduction, Basic nature of simulation, when to simulate, Advantages, disadvantages and limitations of simulation, Concepts of simulation of continuous and discrete system with the help of example.

UNIT-2

Continuous System Simulation: Analog vs. digital simulation, continuous simulation vs. numerical integration, simulation of a chemical reactor, simulation of a water reservoir system.

Discrete system simulation: Fixed time-step vs. event-to-event model, Monte-Carlo computation vs. stochastic simulation, generation of random numbers, and generation of non-uniformly distributed random numbers

UNIT-3

Simulators for the Live systems: Simulation of queuing Systems: basic concepts of queuing theory, simulation of single server, two server and more general queuing system.

Simulation of PERT network: Network model of a project, analysis of an activity network, critical path computation, uncertainties in activity durations, simulation of an activity network.

UNIT-4

Simulation of inventory control systems: Elements of inventory theory, inventory models, generation of Poisson and Erlang variates, simulator for complex inventory systems. Simulation of hypothetical computers.

Design and Evaluation of Simulation Experiments: Variance reduction techniques. Experiment layout and Validation

Simulation Languages: Continuous and Discrete Simulation Languages.

Text Books:

1. Gordon G.: System simulation, Prentice-Hall of India Pvt. Ltd. New Delhi 1993
2. Narsingh Deo: System Simulation with Digital Computer, PHI New Delhi, 1993

Reference Books:

1. Neelankavil Frances: Computer Simulation and Modelling, John Wiley & Sons, New York, 1987.
2. Payne, James A.: Introduction to simulation: Programming Techniques and Methods of Analysis, McGraw-Hill international Editions, Computer Science services, New York (1998).
3. Reitam Julian: Computer Simulation Experiments, Wiley Interscience 1971.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-421 N	Software Testing					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To provide an understanding of concepts and techniques for testing software and assuring its quality.					
Course Outcomes						
CO 1	Expose the criteria and parameters for the generation of test cases.					
CO 2	Learn the design of test cases and generating test cases.					
CO 3	Be familiar with test management and software testing activities.					
CO 4	Be exposed to the significance of software testing in web and Object orient techniques.					

UNIT-1

Introduction: Overview of software evolution, SDLC, Testing Process, Terminologies in Testing: Error, Fault, Failure, Verification, Validation, Difference between Verification and Validation, What is software testing and why it is so hard? Test Cases, Test Oracles, Testing Process, Limitations of Testing.

UNIT-2

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique. Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

UNIT-3

Reducing the number of test cases: Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, and Slice based testing, Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

UNIT-4

Object oriented Testing: Definition, Issues, Class Testing, Object Oriented Integration and System Testing. Testing Web Applications : What is Web testing?, User interface Testing, Usability Testing, Security Testing, Performance Testing, Database testing, Post Deployment Testing.

TEXT BOOKS:

1. Naresh Chauhan “Software Testing Principles and Practices” Oxford Publications, 2012.
2. Louise Tamres, “Software Testing”, Pearson Education Asia, 2002.
3. Robert V. Binder, “Testing Object-Oriented Systems-Models, Patterns and Tools”, Addison Wesley, 1999.
4. William Perry, “Effective Methods for Software Testing”, John Wiley & Sons, New York, 1995.

REFERENCE BOOKS:

1. Cem Kaner, Jack Falk, Nguyen Quoc, “Testing Computer Software”, Second Edition, Van Nostrand Reinhold, New York, 1993.
2. K.K. Aggarwal & Yogesh Singh, “Software Engineering”, 2nd Ed., New Age International Publishers, New Delhi, 2005.
3. Boris Beizer, “Software Testing Techniques”, Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
4. Boris Beizer, “Black-Box Testing –Techniques for Functional Testing of Software and Systems”, John Wiley & Sons Inc.,New York, 1995.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 423 N						
Software Project Management						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The purpose of this course is to introduce students the basics of Entrepreneurship					
CO 1	To study software economics evolution.					
CO 2	To study software management process & its framework.					
CO 3	To study software management planning, responsibilities.					
CO 4	To familiarize students about Project Management And Control					

Unit-1

Conventional Software Management : Evolution of software economics, Improving software economics: reducing product size, software processes, team effectiveness, automation through, Software environments, Principles of modern software management.

Unit-2

Software Management Process : Framework,: Life cycle phases- inception, elaboration, construction and training phase. Artifacts of the process- the artifact sets, management artifacts, engineering artifacts, and pragmatics artifacts, Model based software architectures, Workflows of the process, Checkpoints of the process.

Unit-3

Software Management Disciplines : Iterative process planning, Project organizations and responsibilities, Process automation, Project control and process instrumentation core metrics, management indicators, life cycle expectations, Process discriminates.

Unit-4

Project Management And Control : framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

TEXT BOOKS:

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.
2. . Software Project Management, Walker Royce, Addison Wesley, 1998

REFERENCE BOOKS :

- 1 Project management 2/e, Maylor.
2. Managing the Software Process, Humphrey.
3. Managing Global Software Projects. Ramesh, TMfH, 2001

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-425 N	Distributed Operating System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	Distributed operating system is an important field for study to drive general research in distributed systems.					
Course Outcomes						
CO 1	To study the issues of distributed operating system					
CO 2	To study mutual exclusion algorithms of DOS.					
CO 3	To study deadlock detection & handling strategies of DOS.					
CO 4	To study scheduling of distributed operating system (DOS).					

Unit-1

Architecture of distributed O.S:- Introduction, motivation, system architecture type, issues in distributed O.S., Communication primitive.

Unit-2

Distributed mutual Inclusion:- Introduction, classification preliminaries simple solution, non token based algorithm, Lamport algorithm, Ricart algorithm, Mackawa's algorithm, A generalized non token based algorithm,, token based algorithm, Broad cast algorithm, Heuristic algorithm, tree based algorithm, comparative performance analysis.

Unit-3

Distributed dead lock detection:- Introduction, dead lock handling strategies, issues in deadlock detection & resolution, Control organization, centralized, distributed & hierarchical detection algorithm.

Unit-4

Distributed file system:- Introduction, architecture mechanism for building, design issues, log structured file system.

Distributed Scheduling:- Introduction, motivation, issues in load distribution, component of load algorithm, stabilizing load distribution algorithm, performance comparison, selection of a suitable load sharing algorithm, requirement for load distribution, task migration, issues in task migration.

Text Books:

1. Mukesh Singhal & N.G. Shivaratri: Advanced concepts in operating systems, TMH 2001.
2. A S Tanenbamm: Modern operating systems, PHI.

Reference Books.:

1. A. Silberschatz, P.Galvin, G.Gagne: Applied operating system concepts, Wiley.
2. Operating System Concepts , P.S.Gill, Firewall Media

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-407 N	Server Side Programming Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
-	-	3	60	40	100	3
Purpose	To gain familiarity with what server-side programming is, what it can do, and how it differs from client-side programming.					
Course Outcomes						
CO 1	To study Fundamentals of server side programming and basic programs					
CO 2	To Implement program in ASP to display day, month, date, digital clock.					
CO 3	To implement string function using ASP.					
CO 4	To implement the use of Forms and its validations using ASP.					

List of Experiments:

1. Create a Subroutine with arguments passing & call the subroutine for specific no. of time.
2. Write a program in ASP which define an object & then display the properties of object with method.
3. Write a program in ASP to display present day, month & date. Also display digital clock.
4. Write a program in ASP which will check that a specific file, folder & drive exist or not. Also return the extension of file. Then use the read & write properties on a file using text-stream object.
5. Send information to the user after he submit the form using GET & POST method & implement from validation.
6. Write a program in ASP that has a form taking the user's name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie's content.
7. Use ad-rotator to change advertisements on client side request.
8. Create a session dictionary using object tag. In session-on start add keys for time, user agent, remote I.P. & add appropriate values. Create a simple page to display the values.
9. Implement session tracking using user authentication.
10. Write a program to delete all cookies of your web site that has created on the client's computer.
11. Write a program in ASP to check the capabilities of the browser using browser capability component.
12. Using data base to store & retrieves values input by a user showing them & make updating & add new records to existing database.
13. Create two ASP pages, a form creation web page (selectprice.asp) and a form processing script (liststockbyprice.asp). In selectprice.asp, the user should be shown a form in which he can enter the item & desired maximum price. When it is submitted liststockbyprice.asp will return all the stocks from database whose cost are less than the price entered by user.

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT-409 N	Mobile Application Development Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
-	-	3	60	40	100	3
Purpose	In this lab, a student is expected to design, implement, document and present a mobile					
Course Outcomes						
CO 1	Build a native application using GUI components and Mobile application development					
CO 2	Develop an application using basic graphical primitives and databases					
CO 3	Construct an application using multi threading and RSS feed					
CO 4	Make use of location identification using GPS in an application					

LIST OF PRACTICALS:

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Implement an application that implements Multi threading
6. Develop a native application that uses GPS location information.
7. Implement an application that writes data to the SD card.
8. Implement an application that creates an alert upon receiving a message.
9. Write a mobile application that creates alarm clock.
10. Develop a sign-in page with appropriate validation.
11. Develop a real life application that makes use of database.

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

Semester VIII

IT-402 N						
Mobile Communication						
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To impart knowledge of mobile and wireless communication systems and techniques.					
Course Outcomes						
CO 1	To study the concepts of mobile communication and antennas.					
CO 2	Learn the basic concepts of GSM, GPRS.					
CO 3	Study of various analog & digital modulation techniques.					
CO 4	To study satellite system architecture					

Unit-1

Introduction:

Introduction cell mobile system, tuning efficiency, mobile radio environment, frequency reuse, co channel interface reduction, and handoff mechanism cell cite and mobile antennas, non cochannel interface. Frequency spectrum utility and management channel management, type of handoff and dropped call rat, cell splitting.

Analog and digital modulation techniques, performance of various modulations, spectra efficiency, and error rate, GMSK, GFSK, DQPSK modulation technique in wireless system comparison of various modulation techniques.

Unit-2

Point to point model propagation over terrains, Losses, Power requirements, Smart Antennas, antennas at cite, gain and pattern relationship mobile antennas, tilting effect, parasitic elements usage, diversity techniques.

Unit-3

Digital technology, digital speech, digital mobile telephony, GSM, Multiples access techniques, north TDMA, American TDMA (ISI36), Japauer cellular TDMA (DDC), CDMA, ISFS North American CDMA standards, PCS, PHS, Advanced system, GPRS, UMTS, IMT, WAP.

Unit-4

Satellite system architecture, satellite orbit and constellations, LEO and MEO system, GPS Information, Iridium, MSAT, VSAT, DBS, Orbcomm satellite service, use of mobile communication networks, concepts, advanced mobile communication system using satellite.

Text Book :

1. Rappapart T.S, "Wireless communication", Prentice Hall, NJ.
2. GSM, CDMA & 3G System-steel Lee and Gluis, JW.

Reference Books.:

1. K.FEHER-Wireless Digital engineering
2. Mobile Satellite communication Engineering-Richards Addison Wesley.
3. Lee, WCY, "Mobile Communication Engineering", TMIH, New Delhi.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 404N	Advance Database System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The student will get knowledge of query optimization, parallel and distributed database systems.					
	Course outcomes					
CO 1	To study the fundamental theories and requirements that influence the design of modern database systems					
CO 2	To apply acquired knowledge for developing holistic solutions based on database systems/database techniques					
CO 3	To study and evaluate methods of storing, managing and interrogating complex data					
CO 4	To analyze the background processes involved in queries and transactions, and explain how this impact on database operation and design.					

Unit-1

Parallel & Distributed Databases : Architecture for parallel database, parallel query evolution, parallelizing individual operations, parallel query optimization introduction to distributed databases, distributed DBMS architectures, sorting data in a distributed database DBMS, Distributed catalog management, Distributed query processing, updating distributed data, introduction to distributed transactions, Distributed concurrency control, recovery.

Unit 2

Data Mining : Introduction, counting co-occurrences, mining for rules, tree structured rules, clustering, similarity search over sequences

Unit 3

Object database systems : User defined ADT, structured types, objects and reference types, inheritance, design for an ORDBMS, challenges in implementing an ORDBMS, OODBMS, comparison of RDBMS with OODBMS and ORDBMS

Unit 4

Advanced topics : Advanced transactions processing, integrated access to multiply data source, mobile data bases main memory databases, multimedia data bases, GIS, Temporal and sequenced databases.

TEXT BOOKS:

1. R. Ramakrishna & J. Gehrks “Database Management Systems” MGH, International Ed., 2000.

REFERENCE BOOKS:

1. Korth, Silberschatz, Sudershan: Data Base concepts, MGH, 2001.
2. C. J. Date, Database Systems, 7th Ed., Addison Wesley, Pearson Education, 2000.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 406 N	Information Security					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The course will be useful for students who plan to do research/product development/analysis in areas related to secure computing in their career.					
	Course outcome					
CO 1	To learn basics of network security and cryptography.					
CO 2	To study network authentication mechanism, with security algorithms.					
CO 3	To explore the knowledge of key exchange protocols.					
CO 4	To realize the effect on digitized security.					

Unit-1

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, stenography, key range and key size, possible types of attacks.

Unit-2

Symmetric key Ciphers: Block Cipher principles, Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution.

Asymmetric key Ciphers: Principles of public key crypto systems, Algorithms (RSA, Diffie-Hellman, and ECC), Key Distribution.

Unit-3

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, HMAC, CMAC, Digital signatures, knapsack algorithm

Authentication Applications: Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.

Unit-4

E-Mail Security: Pretty Good Privacy, S/MIME.

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction

Intruders, virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, Firewall design principles, types of firewalls.

TEXT BOOKS

1. William Stallings , “*Cryptography and Network Security*” ;, Pearson Education,4th Edition
2. Atul Kahate , “*Cryptography and Network Security*”, Mc Graw Hill Edition

REFERENCE BOOKS

1. Cryptography and Network Security : Forouzan Mukhopadhyay, MC Graw Hill, 2nd Edition
2. Mark Stamp , “*Information Security, Principles and Practice*” Wiley India.
3. WM.Arthur Conklin, Greg White , “*Principles of Computer Security*”, TMH

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-418N	Cloud Computing					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiar the concepts of cloud services and storage to deploy various resources and arbitrary software.					
Course Outcomes						
CO 1	Facilitate the basic usage and applicability of computing paradigm.					
CO 2	Explore various cloud service and deployment models to utilize different cloud services.					
CO 3	To get enabled for various data, scalability & cloud services in order to get efficient database for cloud storage.					
CO 4	To deal with various security threats and their controlling mechanism for accessing safe cloud services.					

Unit-1

Overview of Computing Paradigm: Recent trends in Computing, Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing, evolution of cloud computing, Business driver for adopting cloud computing.

Cloud Computing (NIST Model), History of Cloud Computing, Cloud service providers, Properties, Characteristics & Disadvantages, Pros and Cons of Cloud Computing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing, Role of Open Standards.

Unit-2

Cloud Computing Architecture: Cloud computing stack, Comparison with traditional computing architecture (client/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, protocols used, Role of Web services, Service Models (XaaS) -Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Deployment Models-Public cloud, Private cloud, Hybrid cloud, Community cloud.

Unit-3

Service Management in Cloud Computing: Service Level Agreements (SLAs), Billing & Accounting, comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling: Benefitting enormously, Managing Data-Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud, Large Scale Data Processing. Case study: Eucalyptus, Microsoft Azure, Amazon EC2.

Unit-4

Cloud Security: Infrastructure Security, Network level security, Host level security, Application level security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management, Access Control, Trust, Reputation, Risk, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations.

Text Books

1. Barrie Sosinsky, Cloud Computing Bible, Wiley - India, 2010.
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Cloud Computing: Principles and Paradigms, Wiley, 2011.

Reference Books

1. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.
2. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley- India, 2010.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 420 N	Introduction to Internet of Things					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To introduce the student to the fundamentals of Internet of Things					
	Course outcomes					
CO 1	To introduce a student to IoT and M2M					
CO 2	To study design methodology of IoT					
CO 3	To study the IoT reference Architecture					
CO 4	To apprise students about the various applications of IoT.					

Unit 1

Introduction : Introduction to IOT, definition and characteristics of IOT, Physical and logical design of IOT, IOT functional blocks, IOT communication model , IOT enabling technologies, IOT advantages & disadvantages ; Difference between IoT and M2M , SDN & NFV for IOT ; Everything as a Service (XaaS)

Unit 2

IoT platform design methodology ; IoT and M2M fundamentals : Devices and gateways; Data management ; Business processes in IoT ; M2M and IoT Analytics, Knowledge Management.

Architecture Reference Model : Domain model , Information model , Functional model , Communication model , Safety , Privacy , Trust , Security, Device level energy issues ;

Unit 3

IoT Reference Architecture: Introduction, Functional View, Information View, Deployment and Operational View, Real world Design constraint

IoT Standards and Protocols: IoT Related Standardization ; An introduction to : - Zigbee , Z-Wave , Thread , MQTT , CoAP, AMQP , Bluetooth Low Energy.

Unit 4

Examples and applications of IOT : Home automation , Environment , Energy, Retail , Logistics , Agriculture , Industry, Smart cities , Participatory sensing , Health and Lifestyle

Text Books

1. Arshdeep Bahga, Vijay Madiseti, *“Internet of Things, A Hands -on Approach”*, 1st Ed 2015, University Press
2. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, , *“From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”*, 1st Edition, Academic Press, 2014.
3. Ovidiu Vermesan , Peter Friess , *“Internet of Things – From Research and Innovation to Market Deployment”* , River publishers , 2014
4. <https://www.tutorialspoint.com> , *“Internet of things tutorial”*

Reference Books

1. Francis daCosta , *“Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”*, 1st Edition, Apress Publications, 2013.
2. Oliver Hersent, David Boswarthick, *“The Internet of Things: Key applications and protocol”*, Wiley ; 2011
3. Michael Miller, *“The Internet of Things, How Smart TVs, Smart Cars, Smart Homes, and Smart Cities are changing the World”*, First edition , 2015 , Pearson Education

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 422 N		Image Processing				
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	The objective of this course is to prepare students to conduct research in image processing.					
Course outcomes						
CO 1	To Understand key algorithms for point, neighborhood, and geometric operations					
CO 2	To study image transformation methods.					
CO 3	To study different techniques of image compression.					
CO 4	To study different attributes of images.					

Unit-1

Digital image fundamentals, application of digital image processing, elements of digital image processing systems, vidicon camera, Line scan CCD senso, area sensor, flash A/D converter display – elements of visual perception, structure of the human eye, Luminance, brightness, contrast, mach band effect, image fidelity criteria, color models, - RGB, CMY, HIS mathematical preliminaries of 2D systems, convolution, Fourier transform – ZS transform – toeplitz and circulant matrices, orthogonal and unitary matrices.

Unit- 2

Image transforms, Unitary transform, 2D, DFT, DCT, DST, Discrete wavelet transform, Discrete Hadamard, Walsh, Hostelling transform, SVD transform, Slant Haar transforms. Image Enhancement and Restoration: Constrast stretching, intensity level slicing, Histogram equalization, spatial averaging, directional smoothing, Median filtering, nonlinear filters, maximum, minimum, geometric mean contra harmonic mean, LP mean filters, edge detection, Roberts, Sobel, Isotropic, Kirsch, Compass gradient, Laplacian operators.

Unit- 3

Degradation model - unconstrained and constrained restoration, inverse filtering, removal of blur caused by uniform linear motion, Wiener filtering, geometric transformations for image restoration.

Unit –4

Image compression- Huffman coding, truncated Huffman coding, Br, Binary codes, arithmetic coding, bit plane coding contrast area coding, Run length encoding, transform coding JPEG and MPEG coding schemes. Image Segmentation, pixel based approach, feature threshold, choice of feature, optimum threshold, threshold selection methods, region based approach, region growing, region splitting, region merging, spilt and merge.

Text books :

1. Gonzalez, R.C. and Woods, R.E., “Digital image processing”, Addison Wesley.
2. A.K.Jain, “Fundamentals of Digital Processing”, PHI.

Reference Books

1. Umbaugh, S.E. “Computer vision and image processing”, Prentice Hall Int. NJ
2. W. Pratt, “Digital Image Processing”, Wiley Inter-science

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-424 N	Expert System					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	-	75	25	100	3
Purpose	To familiarize the student about the methodologies used to transfer the knowledge of a human expert into an intelligent program to solve real-time problems					
Course Outcomes						
CO 1	Examining the fundamentals and terminologies of expert system.					
CO 2	To introduce students to expert system tools.					
CO 3	Signifying AI techniques to solve social, industrial and environmental problems.					
CO 4	Application of professional aspects in multi-disciplinary approach to meet global Standards towards design, realizing and manufacturing.					

Unit-1

Introduction to AI programming languages, Blind search strategies, Breadth first – Depth first – Heuristic search techniques Hill Climbing – Best first – A Algorithms AO* algorithm – game trees, Min-max algorithms, game playing – Alpha beta pruning.

Knowledge representation issues predicate logic – logic programming Semantic nets- frames and inheritance, constraint propagation; Representing Knowledge using rules, Rules based deduction systems.

Unit-2

Introduction to Expert Systems, Architecture of expert system, Representation and organization of knowledge, Basics characteristics, and types of problems handled by expert systems.

Expert System Tools: Techniques of knowledge representations in expert systems, knowledge engineering, System-building aids, support facilities, stages in the development of expert systems.

Unit-3

Building an Expert System: - Expert system development, Selection of tool, Acquiring Knowledge, Building process.

Unit-4

Problems with Expert Systems: Difficulties, common pitfalls in planning, dealing with domain expert, difficulties during development.

TEXT BOOKS

1. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill, New Delhi, 2008.
2. Waterman D.A., “A Guide to Expert Systems”, Addison Wesley Longman, 1985.

REFERENCE BOOKS

1. Stuart Russel , Peter Norvig, “Artificial Intelligence – A Modern Approach”, Prentice Hall, 1995.
2. Patrick Henry Winston, “Artificial Intelligence”, Addison Wesley, 1979.
3. Patterson, Artificial Intelligence & Expert System, Prentice Hall India, 1999.
4. Hayes-Roth, Lenat and Waterman: Building Expert Systems, Addison Wesley, 1983.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT – 426 N	Big Data and Analytics					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
4	1	--	75	25	100	3
Purpose	To provide knowledge of Big Data Analytics and Distributed File Systems.					
	Course outcomes					
CO 1	To learn in details the concepts of big data.					
CO 2	Expose the criteria of big data analytics and big data storage.					
CO 3	To explore knowledge of big data compression techniques.					
CO 4	To explore learning of big data tools .					

Unit-1

Big Data Background:-Big data definition and features of big data, big data value, development of big data, challenges of big data, NoSQL databases, technologies related to big data including cloud computing, Internet of Things, data center, Hadoop, relationship between IoT and big data, relationship between hadoop and big data, big data generation and acquisition includes data collection, data transmission, data pre-processing, big data applications.

Unit-2

Big Data Analytics and Storage:-Big data analysis, big data analytic methods and tools, Pig, Hive, Flume, Mahout, Big data storage, distributed storage system for massive data, storage mechanism for big data GFS, HDFS, HBase, MongoDB, Cassandra, big data storage deduplication techniques, fixed-size and variable-size blocks based deduplication, content defined chunking, frequency based chunking, byte and mult-byte indexing techniques, Cloud storage.

Unit-3

Big Data Compression:-Big data delta compression, Xdelta implementation, Message Digest (MD5), Secure Hash Algorithm (SHA-1/SHA-256), Gear Hash, Tiger Hash, Rabin and Incremental Secure Fingerprint based deduplication, lossless duplicate and similar data elimination approaches, Parallel deduplication and compression using PCOMPRESS, Scalable Decentralized Deduplication Store (SDDS) using Cassandra.

Unit-4

Big Data Processing:- Installation procedure with system requirements for Apache Hadoop, Cassandra, Spark, Pig, Hive, HBase, MongoDB large scale distributed storage systems, Map Reduce programming model working, YARN architecture, Apache Pig and Hive architecture, Single node and Multi-nodes Hadoop Cluster Set up and running a Big Data example, NoSQL implementation.

Text Books:-

1. "Big Data" by Viktor Mayer-Schönberger, Kenneth Cukier, ISBN:978-0544002692, Eamon Dolan/Houghton Mifflin arcourt 2013.
2. "Big Data Now", by O'Reilly Media Inc., ASIN: B0097E4EBQ, O'Reilly 2012.
3. "Hadoop Operation", by Eric Sammer, ISBN: 978-1449327057, O'Reilly 2012.

Reference Books:-

1. "Programming Hive", by Edward Capriolo, ISBN: 978-1449319335, O'Reilly 2012.
2. "HBase: the Definitive Guide", by Lars George, ISBN: 978-1449396107, O'Reilly 2011.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

Object Oriented Software Engineering							
IT – 428N	Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
	4	1	--	75	25	100	3
Purpose	To impart knowledge about the use of Object Oriented Software Engineering approaches and platforms to solve real time problems.						
CO 1	To learn the basic concepts of object oriented systems and software engineering.						
CO 2	To get exposure of various object modeling methodologies						
CO 3	To explore problems using Use Cases, analyzing relations, responsibilities and collaborations among classes and their behavior in problem domain.						
CO 4	To evaluate object oriented design processes using models, design patterns, interfaces designs and communication mechanisms for performing required tasks.						

Unit-1

Introduction : An Overview of Object-Oriented system Development, Objects Basis, Class Hierarchy, Inheritance, Polymorphism, Object Relationships and Associations, Aggregations and Object Containment, Object Persistence, Meta-Classes, Object Oriented Systems Development Life Cycle: Software Development Process, Object Oriented Systems Development: A Use-Case Driven Approach.

Unit -2

Object Oriented Methodologies: Rumbaugh Methodology, Jacobson Methodology, Booch Methodology, Patterns, Frameworks, The Unified approach, Unified Modeling Language (UML)

Unit -3

Object Oriented Analysis Process, Use Case Driven Object Oriented Analysis, Use Case Model, Object Analysis: Classification, Classification Theory, Approaches for identifying classes, Responsibilities and Collaborators, Identifying Object Relationships, Attributes and Methods: Associations, Super-Sub Class relationships, A-Part-of-Relationships-Aggregation, Class Responsibilities, Object Responsibilities.

Unit -4

Object Oriented Design process and Design Axioms, Corollaries, Design Patterns, Designing Classes: Object Oriented Design Philosophy, UML Object Constraint Language, Designing Classes: The Process, Class Visibility, Refining Attributes, Designing Methods and Protocols, Packages and Managing classes, View Layer: Designing Interface objects, Designing View layer Classes, Macro and Micro Level Interface Design Process.

Text books:

1. Ali Bahrami, "Object Oriented Systems Development", McGraw Hill , 2013.
2. Rumbaugh et al., "Object Oriented Modeling and Design", PHI, 2006.
3. Robert Laganière and Timothy C. Lethbridge, "Object-Oriented Software Engineering: Practical Software Development", McGraw-Hill , Sixth Print 2008.

Reference books:

1. Ivar Jacobson, Magnus Christerson, Patrick Jonsson, Gunnar Overgaard, Object-oriented Software Engineering: A Use Case Driven Approach, Pearson Education, New Delhi, 7th Edition Reprint, 2009.
2. David C. Kung, "Object-Oriented Software Engineering: An Agile Unified Methodology", McGraw-Hill, 2013.
3. Bernd Bruegge, Allen H. Dutoit, "Object-Oriented Software Engineering: Using UML, Patterns, and Java", Pearson New International, Third Edition, 2013.

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all, selecting at least one question from each unit.

IT-408 N	Mobile Communication Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
-	-	3	60	40	100	3
Purpose	To understand and demonstrate the mobile communication techniques and satellite system.					
Course Outcomes						
CO 1	To study of home networking					
CO 2	To study RF environment and GSM networks.					
CO 3	To establish the link of establish link between GPS satellite and GPS trainer					
CO 4	To establish PC to PC communication using satellite communication link					

LIST OF PRACTICALS:

1. Observe the Modulation and demodulation using internal generation of 2047 bit PN sequence as modulator input and Bit error rate measurement with PRBS-11 data (2047 bits).
2. Study of home networking using combination of CDMA, BLUETOOTH, infrared Ethernet & various sensors like fire, gas air conditioning. Use at least five sensors
3. Understanding RF environment & study of GSM network by actually connecting to the GSM environment by any services provide SIM like airtel, idea, RPG etc.
4. Real time study of various GSM commands like Network registration, call control, call setting, call information, phone book commands & commands related to network information about number of cells and their strength etc.
5. To understanding the concept of GPS and establishing link between GPS Satellite & GPS Trainer.
6. To establish audio & video combined link & data communication between transmitters, receiver satellite transponder simulated in a lab.
7. To study and observe the difference in uplink & downlink frequency.
8. To establish PC-to-PC communication using satellite communication link.
9. To calculate antenna gain and antenna beam width.
10. Study and observe the Wave Modulation and Demodulation
11. To plot the radiation pattern of micro strip antennas.
12. Study and observe the antenna matching and antenna radiation with distance.

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.

IT – 410 N	Python Programming Lab					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
--	--	3	60	40	100	3
Purpose	The course is designed to provide Basic knowledge of Python					
CO 1	To study fundamentals of python programming and implement basic programs.					
CO 2	To implement the searching technique using python.					
CO 3	To implement sorting techniques using python.					
CO 4	To implement matrix multiplication using python.					

LIST OF PRACTICALS:

1. WAP to compute the GCD of two numbers.
2. WAP to find the square root of a number
3. WAP to find the Exponentiation (power of a number)
4. WAP to find the maximum of a list of numbers
5. WAP for Linear search and Binary search
6. WAP for Selection sort, Insertion sort
7. WAP for Merge sort
8. WAP to find first n prime numbers
9. WAP to multiply matrices
10. WAP that take command line arguments (word count)
11. WAP to find the most frequent words in a text read from a file
12. WAP to Simulate elliptical orbits in Pygame
13. WAP to Simulate bouncing ball using Pygame

Note: A student has to perform at least 10 experiments. At least seven experiments should be performed from the above list. Three experiments may be designed & set by the concerned institution as per the scope of the syllabus.