ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Guwahati

Course Structure and Syllabus

Computer Science and Engineering (CSE)
Semester VII/ CSE/ B.TECH

Sl No	Sub Code	Subject	Hrs			Credits
			L	T	P	C
	Theory					
1	CS131701	Cryptography & Information Security	3	0	0	3
2	CS131702	Software Engineering	3	0	0	3
3	CS131703	Web Technology	3	2	0	4
4	CS131704	Mobile Computing	3	0	0	3
5	**1317E01	Elective I (Departmental)	3	0	0	3
6	HS1317E02	Elective II (Humanities)	2	0	0	2
	Practicals					
7	CS131712	Software Engineering Lab	0	0	2	1
8	CS131713	Web Technology Lab	0	0	2	1
9	CS131715	Project	0	0	8	4
10	CS131721	Seminar on Summer Training	0	0	0	1
Total			17	2	12	**25**
Total Contact Hours : 31						
Total Credit : 25						

Elective-I Subjects		
Sl No	**Subject Code**	**Subject**
1	EE1317E01(IV)	Optimization Techniques
2	**1317E01(V)	Any other subject offered from time to time with the approval of the university

Elective-II Subjects		
Sl No	**Subject Code**	**Subject**
1	HS1317E02(I)	Value Education, Human Rights and Legislative Procedure
2	HS1317E02(II)	Any other subject offered from time to time with the approval of the university

Course Title: CRYPTOGRAPHY & INFORMATION SECURITY
Course Code: CS131701
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

MODULE	TOPIC	COURSE CONTENT	HOURS
1.	**SYMMETRIC CIPHERS**	Overview: Services, Mechanisms and Attacks, The OSI Security Architecture, A Model of Network Security. Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography. Block Cipher and the Data Encryption Standard: Simplified DES, Block Cipher Principles, The DES, The Strength of DES, Differential and Linear Cryptanalysis. Symmetric Ciphers: Triple DES, Blowfish. Confidentiality using Conventional Encryption: Placement of Encryption Function, Traffic Confidentiality, Key Distribution, Random Number Generation.	10
2.	**PUBLIC KEY ENCRYPTION, DIGITAL SIGNATURES**	Number Theory, Prime Numbers Format‟s and Euler‟s Theorems, Testing for Primality. Public Key Cryptography and RSA: Principles of Public Key Cryptosystems, The RSA Algorithms, Key Management, Diffie Hellman Key Exchange.	6
3.	**AUTHENTICATION PROTOCOLS**	Message Authentication: Authentication Requirements, Authentication Functions, Message Authentication Codes, MD5 Message Digest Algorithms, Digital Signatures and Authentication Protocols: Digital Signatures, Authentication Protocols, Digital Signature Standards.	6
4.	**NETWORK SECURITY**	Authentication Applications: Kerberos, X.509 Directory Authentication Service. Electronic Mail Security: Pretty Good Privacy. IP Security: Overview, IP Security Architecture, Authentication Header, Encapsulation Security Payload. Web Security: Web Security Requirements, Secure Sockts Layer and Transport Layer Security, Secure Electronic Transaction.	10
5.	**SYSTEM SECURITY**	Intruders, Malicious Software, Viruses and Related Threats, Counter Measures, Firewalls and its Design Principles.	4

Text Books:

1. William Stallings, Cryptography and Network Security, 4th Edition, Pearson Education/PHI.

ReferenceBooks:

1. Charlie Kaufman, Radia Perlman, Mike Speciner, Network Security: Private Communication in Publ World, 2nd Edition, 2011, Pearson Education.

Course Title: SOFTWARE ENGINEERING
Course Code: CS131702
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

MODULE	TOPIC	COURSE CONTENT	HOURS
1.	**EVOLUTION AND IMPACT OF SOFTWARE ENGINEERING**	Software life cycle models: Waterfall, prototyping, Evolutionary, and Spiral models. Feasibility study, Functional and Non-functional requirements, Requirements gathering, Requirements analysis and specification.	9
2.	**BASIC ISSUES IN SOFTWARE DESIGN**	Modularity, cohesion, coupling and layering, function-oriented software design: DFD and Structure chart, object modeling using UML, Object-oriented software development, user interface design. Coding standards and Code review techniques.	9
3.	**FUNDAMENTALS OF TESTING**	White-box, and black-box testing, Test coverage analysis and test case design techniques, mutation testing, Static and dynamic analysis, Software reliability metrics, reliability growth modeling.	9
4.	**SOFTWARE PROJECT MANAGEMENT**	Project planning and control, cost estimation, project scheduling using PERT and GANTT charts, cost-time relations: Rayleigh-Norden results, quality management, ISO and SEI CMMI, PSP and Six Sigma. Computer aided software engineering, software maintenance, software reuse, Component-based software development.	9

Text Books:

1. Fundamentals of Software Engineering by Rajib Mall, – PHI-3rd Edition, 2009.

Reference Books:

1 .Software Engineering, by Ian Sommerville, Pearson Education Inc., New Delhi, (2009)**.**
2. Software Engineering: A Practitioner‟s Approach", by Roger S. Pressman, McGraw-Hill.

Course Title: WEB TECHNOLOGY
Course Code: CS131703
L-T-P-C: 3-2-0-4

Class Hours/week	4
Expected weeks	12
Total hrs. of classes	36+12 = 48

MODULE	TOPIC	COURSE CONTENT	HOURS
1.	**AN INTRODUCTION TO WEB TECHNOLOGY**	History of web Development, Time line, Motivation, Categories of Web Applications, Characteristics of Web Applications. Evolution and Need for Web Engineering, Web Engineering Models, Software Engineering v/s Web Engineering . World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTP and FTP. Introduction to Browser and search engines, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines , Miscellaneous Web Browser details, Introduction to Web Servers: Features of web servers, caching, case study-IIS, Apache, Configuring web servers.	8
2.	**INFORMATION ARCHITECTURE**	The role of the Information Architect, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets Creating Cohesive Websites: Conceptual Overview Website Development, Website Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems Good & bad web design, Process of Web Publishing. Phases of Web Site development, enhancing your web-site, submission of website to search engines Web security issues, security audit of websites, Web effort estimation, Productivity, Measurement, Quality usability and reliability. Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, Notations Tools. Principles Requirements Engineering Activities , Adapting RE Methods to Web Application.	12
3.	**TECHNOLOGIES FOR WEB APPLICATIONS**	HTML and DHTML, HTML Basic Concepts, Static and dynamic HTML, Structure of HTML documents, HTML Elements, Linking in HTML, Anchor Attributes, Image Maps,	8

		Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form. Elements. Introduction to CGI PERL, JAVA SCRIPT, PHP, ASP , Cookies Creating and Reading Cookies	
4.	**TECHNOLOGIES FOR WEB APPLICATIONS**	Introduction of XML, Validation of XML documents, DTD, Ways to use XML, XML for data files, HTML Vs XML, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML,Relationship between HTML, SGML and XML, web personalization, Semantic web, Semantic Web Services, Ontology.	8
5.	**E- COMMERCE**	E-commerce Business Models, The Internet and World Wide Web: E-commerce Infrastructure, Building an E-commerce Web Site , Electronic Commerce environment and opportunities. Modes of Electronic Commerce, Approaches to safe Electronic Commerce, Electronic Cash and Electronic Payment Schemes ,Online Security and Payment Systems, Ecommerce Marketing Concepts, Advertising on the Internet: issues an Technologies, Ecommerce Marketing Concepts Electronic Publishing issues, approaches, legalities and technologies, Privacy and Security Topics: Introduction, Web Security , Encryption schemes, Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act.	12

Recommended Books:

1. Roger S.Pressman, David Lowe, "Web Engineering", Tata Mcgraw Hill Publication, 2007
2. Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
3. Gopalan N P, Akilandeswari "Web Technology: A Developer s Perspective", PHI
4. NEIL GRAY "Web server Programming" WIley
5. CHRIS BATES Web Programming: Building Internet applications Wiley
6. Moller, "An Introduction to XML and Web Technologies" , Pearson Education New Delhi
7. Beginning XML 4th Edition Hnter, Refter, Fawset Wiley India
8. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
9. C. Xavier, "Web Technology & Design", Tata McGraw Hill.
10 Ivan Bay Ross, "HTML,DHTML,Java script,Perl CGI" , BPB

Course Title: MOBILE COMPUTING
Course Code: CS131704
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

MODULE	TOPIC	COURSE CONTENT	HOURS
1.	**TECHNICAL BACKGROUND**	Transmission Fundamentals , Communication Networks , Protocols and the TCP/IP Suite	4
2.	**WIRELESS COMMUNICATION TECHNOLOGY**	Cellular Wireless Networks , Antennas and Wave Propagation, Modulation Techniques, Multiple Access in Wireless System	6
3.	**MOBILE ADAPTIVE COMPUTING**	Mobility Management , Data Dissemination and Management	5
4.	**CONTEXT-AWARE COMPUTING**	Context-Aware Computing	4
5.	**INTRODUCTION TO MOBILE MIDDLEWARE**	Middleware for Application Development: Adaptation and Agents , Service Discovery Middleware: Finding Needed Services	5
6.	**INTRODUCTION TO AD HOC AND SENSOR NETWORKS**	Challenges , Protocols	4
7.	**WIRELESS SECURITY**	Approaches to Security , Security in Wireless Personal Area Networks , Security in Wireless Local Area Networks ,Security in Wireless Metropolitan Area Networks (802.16), Security in Wide Area Networks.	8

Text Books:

1. Wireless Communications and Networking, Willam Stallings, Pearson Education. (2002)
2. "Fundamentals of Mobile & Pervasive Computing" by Frank Adelstein, Sandeep Ks Gupta, ISBN: 9780070603646, TMH (2005)

Reference Books:

1. Jochen Schiller, *"Mobile Communications,"* Addison-Wesley (2009)
2. R. Dayem, *"Mobile Data & Wireless Lan Technologies,"* Prentice-Hall (2005)

Course Title: ELECTIVE I (Departmental)
Course Code: EE1317E01(IV)
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

OPTIMIZATION TECHNIQUES

MODULE	TOPIC	COURSE CONTENT	HOURS
1.	**INTRODUCTION TO OPTIMIZATION**	Introduction, Historical development, Engineering Application of Optimization, Statement of an Optimization problem-Design Vector, Design Constraints, Constraint Surface, Objective Function Surfaces. Classification of Optimization Problems, Optimization techniques, Engineering Optimization Literature. Problems	8
2.	**CLASSICAL OPTIMIZATION TECHNIQUES**	Introduction, single variable Optimization, multi-variable Optimization with no constraints, multivariable Optimization with equality constraints, multivariable Optimization with inequality constraints, convex programming problems.	7
3.	**LINEAR PROGRAMMING I: SIMPLEX METHOD**	Introduction, Application of Linear Programming, Standard form of a Linear Programming Problem, Geometry of a Linear Programming Problems, Definitions and Theorem, Solution of a system of Linear simultaneous equation, Pivotal reduction of a general system of equation, motivation of the simplex method, Simplex algorithm, two phases of the simplex method	7
4.	**LINEAR PROGRAMMING II: ADDITIONAL TOPICS AND EXTENSIONS**	Revised simplex method, duality in linear programming, decomposition principle, sensitivity or postoptimality analysis, Transportation problem, Karmarkar's Method, quadratic programming.	7
5.	**NON-LINEAR PROGRAMMING: ONE DIMENSIONAL MINIMIZATION METHODS**	Introduction, unimodal function, Unrestricted search, exhaustive search, dichotomous search, Interval Halving method, Fibonacci method,	7

Textbooks/References:

1. Optimization Theory and Application – SS Rao, Wiley Eastern Ltd, 3rd edition
2. Optimization Techniques-Chander Mohan, Kusum Deep, New Age Science.
3. Optimization Techniques-Paban Kumar Oberoi, Global Vision Publishing House
4. Computer based Optimization Techniques-Tanweer Alam- A.B.Publications
5. Operation Research-An Introduction-TAHA H A,Prentice Hall

Course Title: ELECTIVE II (Humanities)
Course Code: HS1317E02(I)
L-T-P-C: 2-0-0-2

Class Hours/week	2
Expected weeks	12
Total hrs. of classes	24

VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURE

MODULE	TOPIC	COURSE CONTENT	HOURS
1	**VALUES AND SELF DEVELOPMENT**	Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles, Value judgments. Importance of cultivation of values, Sense of duty, Confidence, National unity, Patriotism, Love for nature, Discipline. Devotion, Self reliance.	5
2	**PERSONALITY AND BEHAVIOUR DEVELOPMENT**	Soul and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation	4
3	**CHARACTER AND COMPETENCE**	Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control	4
4	**HUMAN RIGHTS**	Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups.	5
5	**LEGISLATIVE PROCEDURES**	Indian constitution, Philosophy, fundamental rights and duties, Legislature, Executive and Judiciary, Constitution and function of parliament, Composition of council of states and house of people, Speaker, Passing of bills, Vigilance, Lokpal and functionaries.	6

Textbooks:

1. Chakraborty, S.K., Values and Ethics for Organizations Theory and Practice, Oxford University Press, New Delhi
2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi

3. Basu, D.D., Indian Constitution, Oxford University Press, New Delhi

Reference Books:

1. Frankena, W.K., Ethics, Prentice Hall of India, New Delhi,
2. Meron Theodor, Human Rights and International Law Legal Policy Issues, Vol. 1 and 2, Oxford University Press, New Delhi

PRACTICALS

Course Title: SOFTWARE ENGINEERING LAB
Course Code: CS131712
L-T-P-C: 0-0-2-1
Expected No. of weeks : 12 (approx)

EXPERIMENT NO	AIM OF EXPERIMENT	HOURS
1	Design an experiment to fine out the LOC count for any source code	1
2	Design a test plan suite document for any application (e.g. ATM system)	1
3	Design a Network Activity Diagram for any application	1
4	Design a Pert Chart for any application	1
5	Design a Grant Chart Diagram for any application	1
6	Design a CFG (Control flow graph) for any Source Code	1
7	Design SRS for any application using Software Architect	1
8	Design a Use Case Diagram for any Application (e.g. Library Management System) using Software Architect	1
9	Design a Class Diagram for any Application (e.g. Library Management System) using Software Architect	1
10	Design a Sequence Diagram for any Application (e.g. Library Management System) using Software Architect	1
11	Design a Activity Diagram for any Application (e.g. Library Management System) using Software Architect	1
12	Design a State Chart Diagram for any Application (e.g. Library Management System) using Software Architect	1
13	Design a Collaboration Diagram for any Application (e.g. Library Management System) using Software Architect	1
14	Implement any Application (e.g. Inventory Management System) system using any programming language (e.g. Java, VB.Net etc.)	3
15	Case Studies: Manual Testing and Automatic Testing exercises using Rational Software Testing tool.	3
	TOTAL	19

Course Title: WEB TECHNOLOGY LAB
Course Code: CS131713
L-T-P-C: 0-0-2-1
Expected No. of weeks : 12 (approx)

EXPERIMENT NO	AIM OF EXPERIMENT	HOURS
1	➢ Write an HTML program to make a list of Nested Unordered and Nested Ordered list for the following items: Asia o India ▪ Assam ▪ Maharashtra ▪ Karnataka o China o Pakistan • Europe • Africa ➢ Write the HTML code for a page containing two frames. One of the frames may contain 2 or 3 links and on clicking one of the links, a different page is loaded on the other frame.	3
2	➢ Write a program in JavaScript to calculate compound interest for ten years where principal and rate is inputted by the user. Then generate a table of 10 rows and 2 columns and fill the cells of the table by the amount for each year. ➢ Write a program in JavaScript to find the sum and average of *n* different numbers (*n* is inputted by the user).	3
3	➢ Write a program in JavaScript to generate random numbers from 1 to 10 and fill the cells of a table having 5 rows and 5 columns. ➢ Write a program in JavaScript to generate an array of random numbers and perform linear search on it.	3
4	➢ Write a program in JavaScript to generate a two-dimensional array, where the row, column and values for the array will be given by the user. ➢ Write a program in JavaScript to enter a sentence and then split the sentence into words using *split ()* and *join ()* methods.	3
5	➢ Write a program in JavaScript to open and close a child window by using *window.open()* and *window.close()* functions. ➢ Write a program in JavaScript to show the usage of *focus ()* and	3

	select () methods. ➢ Write a program in JavaScript to validate the E-Mail address inputted by the user.	
6	➢ Write a program in JavaScript to restrict the user from entering any values inside a text box other than a number. ➢ Write a program in HTML and Java Script to check whether a substring is present inside a string or not. ➢ Write a program in Java Script for creating and storing cookies. ➢ Write a program in Java Script that shows the number of seconds that a user has spent viewing a particular web page.	3
7	➢ Write a program in Java Script that the color of a web page on clicking of a button. ➢ Write a program in Java Script that depicts use of the events onMouseOver and onMouseOut on an image. ➢ Write a JSP/PHP program to convert ten different temperature values from Fahrenheit to Celsius and show the result in tabular format. ➢ Write a JSP/PHP program to show how session management can be performed.	3
8	➢ Write a JSP/PHP program to calculate the Simple Interest, where amount, rate and year are inputted by the user. ➢ Write a program in JSP/PHP to see the current date and time. ➢ Write a simple JSP/PHP program to performing the following: o Addition o Deletion o Updation ➢ Write a JSP/PHP program to implement a simple phone directory service.	3
9	➢ Create a Simple JSP/PHP page where a user can post his suggestions. ➢ Convert the following into an XML page: <html> <head> <title>Book</title> </head> <body> o Web Technology o Authors: o ▪ - Richardson ▪ - Alex ▪ - Richardson	3

	▪ Alex o o Rs.300 o Wrox Publication </body> </html> Following is an XML document: <?xml-stylesheet type="text/xsl" href="employee1.xsl"?> <PAYROLL> <EMPLOYEE> <ID>1010</ID> o <NAME>John Smith</NAME> o <DEPARTMENT>Projects</DEPARTMENT> o <BASICPAY>30000</BASICPAY> o <MANAGER>Ron Martin</MANAGER> </EMPLOYEE> …… …… </PAYROLL> o Write an XSL document to display the data in a browser in a tabular format. o Write an XSL document to display only those employees whose 'DEPARTMENT' is 'Projects'.	
	TOTAL	27

CS131715	**PROJECT**	L = 0 T = 0 P = 8 C = 4
GUIDELINES WILL BE UPLOADED BY THE UNIVERSITY FROM TIME TO TIME		
CS131721	**SEMINAR ON SUMMER TRAINING**	L = 0 T = 0 P = 0 C = 1
GUIDELINES WILL BE UPLOADED BY THE UNIVERSITY FROM TIME TO TIME		