ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Guwahati

Course Structure and Syllabus

Bachelor of Computer Application (BCA)

4th Semester

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4th Semester

Sl.No.	Subject Code	Subject Name	L	T	P	C	Marks	
Theory							**CE**	**ESE**
1	BCA171401	Software Engineering	3	2	0	4	30	70
2	BCA171402	Web Technology	3	2	0	4	30	70
3	BCA171403	Theory of Computer Science	3	2	0	4	30	70
4	BCA171404	Computer Networks	3	2	0	4	30	70
Practical								
1	BCA171415	Laboratory-IV (Web Tech lab)	0	0	10	5	15	35
TOTAL			12	8	10	**21**	**135**	**315**
Total Contact Hrs: 30; **Total Credit: 21**								

Paper Code : BCA171401
Paper Name : Software Engineering
L-T-P-C: 3-2-0-4

UNIT		Content	Weeks
1		**INTRODUCTION:** Overview of Software Processes, Software life cycle Models - Waterfall, Iterative, Prototype and Spiral Models.	3
2		**PROJECT MANAGEMENT:** Project planning, Software cost estimation – techniques (empirical and heuristics), COCOMO models.	2
3		**SOFTWARE REQUIREMENTS** Feasibility Studies, Functional and non-functional requirements, software prototyping, SRS document.	2
4		**DESIGN CONCEPTS** Design fundamentals, design representation, function and Object Oriented Design, cohesion and coupling, Overview of DFD and UML diagrams (usecase, activity, sequence and class).	3
5		**CODING AND TESTING:** Coding style, Structured programming, verification and validation, error and debugging, black box and white box testing, unit testing, system testing, Integration testing.	3
6		**SOFTWARE MAINTENANCE:** Maintainability factors, Importance of maintenance, maintenance types	2
Books	1.	Rajib Mall; Software Engineering	
	2.	Sommerville, Software Engineering, Pearson education	
	3.	Pressman. R.S..Software Engineering: A practitioner's Approach. Mc GrawHill	

Paper Code: **BCA171402**

Paper Name: **Web Technology**

L-T-P-C: 3-2-0-4

UNIT		Content	Weeks
1		**Internet Basics:-**Introduction to Internet and WWW.Computer Network, types of Computer Network: LAN, WAN, MAN; Network Topologies.	2
2		Web Browsers and how it works, Search Engines, Categories of Search Engines, Hypertext Transfer Protocol (HTTP), URL, Protocols (SMTP, POP3, IMAP), Browsers – versions and functions, URLs, webpage and Type of webpage, Domain Names.	3
3		**Static Web Development:** HTML - Introduction to HTML, HTML Document structure tags, HTML comments, Text formatting, inserting special characters, anchor tag, adding images, types of lists, tables, frames, Forms Processing.	3
4		**Introduction to Java Script:** Data Types, Control Statements, Operators, Built in and User-Defined Function.	2
5		**Cascading Style Sheet:** Types of Style Sheets – Internal, Inline and External style sheets, creating styles.	1
6		**Server side programming**: Introduction to PhP, variables,coperator,Array Looping, Function etc. Web Server Concepts, Database Connectivity using Mysql	3
Books:	1.	Web Technologies 2nd Edition, Achyut S Godbole & Atul Kahate	
	2.	Internet and World Wide Web Deitel HM, Deitel ,Goldberg , Third Edition	

Paper Code : BCA171403

Paper Name : **Theory of Computer Science**

L-T-P-C: 3-2-0-4

UNIT	PARA	Content	Weeks
1		Basics:	
		Concepts of Automata Theory: Automata, Alphabets, Strings, Languages, Grammars.	1
2		Automata and Finite state machine:	
	2.1	Automata and its applications, FSM, comparison between automata and FSM, string acceptance, Minimization of Automata.	2
	2.1	Finite Automata: Deterministic and non deterministic finite Automata, Equivalence of DFA & NFA, Finite Automata with Epsilon-Transitions.	2
3		Grammars and Languages:	
	3.1	Classification of grammars and languages, designing a grammar, acceptance of string.	1
	3.2	Regular Expression(RE) and Languages: Building RE, operators of RE, Conversion of RE to Automata and Automata to RE. automata corresponding to regular grammar, Application of RE and its algebraic laws, Closure properties of RE, homomorphism and it's inverse for RL	3
	3.3	Context-free Grammars: Definition and Derivation of languages. Derivation tree, Ambiguity in Grammars and languages, Simplification of CFG	2
Books:	1.	Hopcroft, Motwani & Ullman: Introduction to Automata Theory, Languages and Computation. 3rd Edn. LPE.	
	2.	Theory of Computer Science(Automata Languages and Computation): KLP Mishra, N.Chandrasekaran, PHI	
	3	Martin : Introduction To Languages & Theory Of Computation, TMH	
	4	Formal Languages and Automata Theory, C.K Nagpal, OXFORD	

Paper Code : Computer Networks

Paper Name : BCA171404

L-T-P-C: 3-2-0-4

Unit	PARA	Content	Weeks
1.		**Introduction to Computer Networks:** What is Computer Networks? Types of computer networks: LAN, MAN, WAN, Wireless and wired networks, broadcast and point to point networks, Network topologies, Network protocols, interfaces and services, ISO-OSI reference model, TCP/IP reference model.	2
2.		**Physical Layer:** Concept of Analog & Digital Signal, Transmission Modes, Bandwidth, Transmission Impairments, Data rate limits : Nyquist formula, Shannon Formula, Multiplexing : Frequency Division, Time Division, Wavelength Division. Introduction to Transmission Media : Twisted pair, Coaxial cable, Fibre optics Switching: Circuit Switching, Message Switching ,Packet Switching & their comparisons.	4
3.		**Data Link Layer:** Design issues, Framing, Error detection and correction codes: checksum, CRC, hamming code, Data link protocols for noisy and noiseless channels, Sliding Window Protocols: Stop & Wait ARQ, Go-back-N ARQ, Selective repeat ARQ, Data link protocols: HDLC and PPP.	4
4.		Network Layer: Design issues, Classful and Classless Addressing , Categories of Routing algorithms Congestion control, Congestion prevention policies, Leaky bucket and token bucket algorithms.	2
5.		**Transport Layer:** Elements of transport protocols, connection establishment and release, flow control Internet Transport Protocol (TCP and UDP)	2
6.		**Application Layer:** World Wide Web (WWW), Domain Name System (DNS), E-mail, File Transfer Protocol (FTP),	1
7.		**Networking and Internetworking Devices**: Hub, Bridge, Switch Router, Gateway.	1
Books: 1. Forouzan, Data communication and networking, 4th Edn, TMGH 2. Tanenbaum A.S., Computer Network, PHI (EEE)			

Paper Code: BCA171415

Paper Name: Laboratory-IV (Web Tech Lab)

L-T-P-C: 0-0-10-5

UNIT	PARA	Content	Weeks
1	1.1	Designing simple HTML page, Headings, Paragraphs, Line Breaks etc	4
	1.2	Creating Links to Other Pages	3
	1.3	Using Frames, Tables, List in a web page	3
	1.4	Forms processing, Style sheets	3
2		Simple JavaScript to perform Arithmetic operations , Controlling JavaScript Execution	3
Books:	1.	E. Balagurusamy, **Programming with Java**, Third Edition, Tata McGraw-Hill Publication	
	2.	SQL, PL/SQL: The Programming Language Of Oracle, Ivan Bayross, BPB Publication	

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