Department of Information Technology (In-house)
Syllabus of Bachelor of Computer Application (BCA)
(Effective from academic session 2019-20)

Semester-5

Name of the Course: BCA **Subject:** Internet Technology & Internet Technology Lab	
Course Code: BCA501 + BCA591	**Semester: 3rd**
Duration: 36 Hours	**Maximum Marks: 100 + 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	End Semester Exam: 70
Tutorial: 0	Attendance : 5
Practical: 4 hrs./week	Continuous Assessment: 25
Credit: 3 + 2	Practical Sessional internal continuous evaluation: 40
	Practical Sessional external examination: 60

Aim:	
Sl. No.	
1	To gain comprehensive knowledge of Internet and its working.
2	Ability to use services offered by internet.
3	To enhance skill to develop websites using HTML , CSS, JS.

Objective:	
Sl. No.	
1	To introduce the students to the network of networks -Internet.
2	To enable the students to use various services offered by internet.
3	To gain knowledge about the protocols used in various services of internet.
4	To understand the working and applications of Intranet and Extranet.

Pre-Requisite:	
Sl. No.	
1	Understanding of basic programming logic.

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Introduction to Networking Overview of Networking, Intranet, Extranet and Internet, Domain and Sub domain, Address Resolution, DNS, Telnet, FTP, HTTP, Features, Segment, Three-Way Handshaking, Flow Control, Error Control, Congestion control, IP Datagram, IPv4 and IPv6, Classful and Classless Addressing, Subnetting. NAT, IP masquerading, IPtables, Routing -Intra and Inter Domain Routing, Unicast and Multicast Routing, Broadcast, Electronic Mail	8	12
02	Web Programming Introduction to HTML, Editors, Elements, Attributes, Heading, Paragraph.	8	15

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	Formatting, Link, Head, Table, List, Block, Layout, CSS. Form, Iframe, Colors, Color name, Color value, Image Maps, area, attributes of image area, Extensible Markup Language (XML), CGI Scripts, GET and POST Methods.		
03	Server Side Programming and Scripting Basic PHP Programming, Variable, Condition, Loop, Array, Implementing data structure, Hash, String, Regular Expression, File handling, I/O handling, JavaScript basics, Statements, comments, variable, comparison, condition, switch, loop, break. Object – string, array, Boolean, reg-ex. Function, Errors, Validation, Definition of cookies, Create and Store cookie.	8	15
04	Security Issues Network security techniques, Password and Authentication, VPN, IP Security, security in electronic transaction, Secure Socket Layer(SSL), Secure Shell (SSH), Introduction to Firewall, Packet filtering, Stateful, Application layer, Proxy.	**6**	**13**
05	Advance Internet Technology Internet Telephony (VoIP), Multimedia Applications, Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streamingmedia, Codec and Plugins, IPTV, Search Engine Optimization, Metadata.	**6**	**15**
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination		**30**
	Total:		**100**

Practical
Course Code: BCA591
Credit: 2
Skills to be developed:
Intellectual skills:

1. Ability to understand Web Design and Development.
2. Ability to analyze problems and provide program based solutions.

List of Practical:

1. As compatible to theory syllabus.

Assignments:
Based on the curriculum as covered by subject teacher.

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
N.P. Gopalan and J. Akilandeswari	Web Technology: A Developer's Perspective		PHI

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Rahul Banerjee	Internetworking Technologies, An Engineering Perspective		PHI Learning
Reference Books:			

List of equipment/apparatus for laboratory experiments:	
Sl. No.	
1.	Computer with moderate configuration

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	1 to 5	10	10				
B	1 to 5			5	3	5	70
C	1 to 5			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**
A	**All**	**1**	**10**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**5**	**3**

Examination Scheme for Practical Sessional examination:

Practical Internal Sessional Continuous Evaluation

Internal Examination:

Five No of Experiments			

External Examination: Examiner-

Signed Lab Note Book(for five experiments)	**5*2=10**	
On Spot Experiment(one for each group consisting 5 students)	**10**	
Viva voce	**5**	

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Name of the Course: BCA **Subject:** Introduction to Information Security	
Course Code: BCA502	**Semester: 5th**
Duration: 36 Hrs.	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	**End Semester Exam: 70**
Tutorial: 1 hrs./week	**Attendance : 5**
Practical: 0	**Continuous Assessment: 25**
Credit: 4	**Practical Sessional internal continuous evaluation: NA**
	Practical Sessional external examination: NA

Aim:	
Sl. No.	
1.	This introductory course is aimed at giving basic understanding about system security.
2.	This entry-level course covers a broad spectrum of security topics and is based on real-life examples to create system security interest in the students
3.	A balanced mix of technical and managerial issues makes this course appealing to attendees who need to understand the salient facets of information security basics and the basics of risk management.

Objective:	
Sl. No.	
1.	Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2.	Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
3.	Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4.	Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges

Pre-Requisite:	
Sl. No.	
1.	Not Required

Contents		**4 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Information and Network Security fundamentals** Overview of Networking Concepts Basics of Communication Systems, Transmission Media, Topology and Types of Networks, TCP/IP Protocol, Wireless Networks, The Internet Information Security Concepts Information Security Overview: Background and Current Scenario,	**16**	**20**

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	Types of Attacks, Goals for Security, E-commerce Security Security Threats and Vulnerabilities Overview of Security threats, Weak / Strong Passwords and Password Cracking, Insecure Network connections, Malicious Code Cybercrime and Cyber terrorism Cryptography Introduction to Cryptography, Digital Signatures, Public Key infrastructure, Applications of Cryptography, Tools and techniques of Cryptography		
02	**Security Management** Security Management Practices Overview of Security Management, Security Policy, Risk Management, Ethics and Best Practices Security Laws and Standards Security Assurance, Security Laws, International Standards, Security Audit	**8**	**10**
03	**Information and Network Security** Server Management and Firewalls User Management, Overview of Firewalls, Types of Firewalls, DMZ and firewall features Security for VPN and Next Generation Technologies VPN Security, Security in Multimedia Networks, Various Computing Platforms: HPC, Cluster and Computing Grids, Virtualization and Cloud Technology and Security	**6**	**20**
04	**System and Application Security** Security Architectures and Models Designing Secure Operating Systems, Controls to enforce security services, Information Security Models System Security Desktop Security, Email security, Database Security	**6**	**20**
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**40**	**100**

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
B. A. Forouzan	Data Communications and Networking	3rd Ed	TMH
A. S. Tanenbaum	Computer Networks	4th Ed	Pearson Education/PHI
Reference Books:			
W. Stallings	Data and Computer Communications	5th Ed	PHI/ Pearson Education
Atul Kahate	Cryptography &		TMH

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		Network Security					
End Semester Examination Scheme.			**Maximum Marks-70.**		**Time allotted-3hrs.**		
Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A B C	1,2,3,4,5 3, 4, 5 1,2,3,4,5	10	10	 5 5	 3 3	 5 15	 60

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

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Name of the Course: BCA **Subject:** Theory of Computation	
Course Code: BCA503	**Semester: 5th**
Duration: 36 Hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	End Semester Exam: 70
Tutorial: 1 hr./week	Attendance : 5
Practical: 0	Continuous Assessment: 25
Credit: 4	Practical Sessional internal continuous evaluation: 40
	Practical Sessional external examination: 60

Aim:	
Sl. No.	
1	To gain knowledge of automata theory.
2	To understand the theoretical computer science.
3	
4	

Objective:	
Sl. No.	
1	Study various types of finite automata.
2	Understand the challenge of theoretical computer science and it's application.
3	
4	
5	

Pre-Requisite:	
Sl. No.	**None**

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Languages Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar	**8**	**10**
02	Finite Automata and Regular Languages Regular Expressions, Transition Graphs, Deterministics and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.	**10**	**20**
03	Context free languages Context free grammars, parse trees, ambiguities in grammar and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.	**10**	**20**

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04	Turing Machines and Models of Computation RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages, unsolvability problems.	**8**	**20**
	Sub Total:	**36**	**70**
	Internal Assessment Examination & Preparation of Semester Examination		**30**
	Total:		**100**

Assignments:

Based on the curriculum as covered by subject teacher.

List of Books

Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Daniel I.A.Cohen	Introduction to computer theory	8th Edition	John Wiley Publications
Lewis & Papadimitriou	Elements of the theory of computation		PHI
Hoperoft, Aho, Ullman	Introduction to Automata theory, Language & Computation	3 rd Edition	Pearson Education
Reference Books:			
P. Linz	An Introduction to Formal Language and Automata	4th edition	Publication Jones Bartlett

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1 to 4**	**10**	**10**				
	1 to 4						
B				**5**	**3**	**5**	**70**
	1 to 4						
C				**5**	**3**	**15**	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.

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- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

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Name of the Course: BCA **Subject:** Minor Project	
Course Code: BCA581	**Semester: 5th**
Duration: 40 Hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 0	End Semester Exam: NA
Tutorial: 0	Attendance: NA
Practical: 4 hrs./week	Continuous Assessment: NA
Credit: 6	Practical Sessional internal continuous evaluation:40
	Practical Sessional external examination: 60

Aim:	
Sl. No.	
1	To develop team work.
2	To develop understanding of project management.
3	To be able to implement real life software or hardware based projects.

Objective:	
Sl. No.	
1	To develop team work.
2	To develop understanding of project management.
3	To be able to implement real life software or hardware based projects.

Pre-Requisite:	
Sl. No.	
1.	None

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Name of the Course: BCA **Subject:** Industrial Training	
Course Code: BCA582	**Semester: 5th**
Duration: 4 weeks	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 0	End Semester Exam: NA
Tutorial: 0	Attendance: NA
Practical: 0	Continuous Assessment: NA
Credit: 2	Practical Sessional internal continuous evaluation:40
	Practical Sessional external examination: 60

Aim:	
Sl. No.	
1	To develop industrial understanding.
2	To develop understanding of project management.
3	To cope up with industry oriented real time project environment.

Objective:	
Sl. No.	
1	To develop team work.
2	To develop understanding of project management.
3	To be able to implement real life software or hardware based projects.

Pre-Requisite:	
Sl. No.	
1.	None