NAME OF DEPARTMENT: Computer Applications

Subject Name: Computer Graphics **Subject Code:** TBC 601

Course Name: BCA

1 Contact Hours: 45 **L** 3 **T** 0 **P** 2

2 Examination Duration (Hrs): **Theory** 0 3 **Practical** 0 2

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 3

5 Semester: ☑ **Autumn** ☐ **Spring** ☐ **Both**

6 Pre-Requisite: **Knowledge of Computers**

7 Subject Area: **Computer Application**

8 Objective: To familiarize students with Computer Graphics

9 Course Outcome:

CO1 Understand core concepts of computer graphics.
CO2 Understand and implement algorithms to draw graphic objects.
CO3 Understand and implement 2 D transformation
CO4 Understand and implement 3 D transformation
CO5 Implement Clipping and filling of graphics objects.
CO6 To describe the importance of viewing and projections.

10 Details of the Course:

Unit No.	CONTENT	CONTACT HOURS
1	**Introduction to Computer Graphics:** Definition, Applications, Graphics Hardware, Display Devices: Refresh Cathode Ray Tube, Raster Scan Display, Plasma display, Liquid Crystal display, Plotters, Printers. Dithering, Half-toning, Aliasing, Anti-aliasing	8
2	**Mathematics for Computer Graphics:** Point representation, Vector representation, Matrices and operations related to matrices, Vector addition and vector multiplication, Scalar product of two vectors, Vector product of two vectors. Parametric equations of lines and conics.	10
3	**Line Drawing Algorithms:** DDA algorithms, Bresenham's Line algorithm. Circle and ellipse generation algorithm. **Clipping**: Point Clipping, Line Clipping. Polygon Clipping. **Filling:** Inside Tests, Flood fill algorithm, Boundary-Fill Algorithm and scan-line polygon fill algorithm.	10
4	**2D Transformation:** 2D transformation, Basic Transformations, Composite transformations: Reflection, Shearing, Transformations between coordinate systems. **3D Transformation**: 3D transformations, Parallel projection, Perspective	9

	projection, Visible lines and surfaces identification, Hidden surface removal algorithms.	
5	**Animation:** Introduction to Animation, Principles of Animation, Types of Animation, Types of Animation Systems: Scripting, Procedural, Representational, Stochastic, etc. GKS Standards, GKS Primitives – Polyline, Polymarker, and Fill area, Text, GKS Workstation and Metafiles.	8
	TOTAL	**45**

11 Suggested Books:

Sl. NO.	NAME OF AUTHERS/BOOKS/PUBLISHERS	YEAR OF PUBLICATION/REPRINT
1	Donald Hearn and M. Pauline Baker, "Computer Graphics", PHI	2008
2	Steven Harrington, "Computer Graphics: A Programming Approach", TMH	2000
3	**V.K.Pachghare**, "Computer Graphics", Second Edition, Laxmi Publications	2011
4	P. K. Singh, Rajendra Kumar, "Computer Graphics (GBTU)", First Edition, Vikas Publishing House Pvt. Ltd.	2010
5	Newman and Sproul, "Principle of to Interactive Computer Graphics", McGraw Hill	2005

NAME OF DEPARTMENT: Computer Applications

Course Name: Bachelor of Computer Applications

Subject Name: Network Security and Cyber Law **Subject Code:** TBC-602

1 Contact Hours: 45 **L** 3 **T** 0 **P** 0

2 Examination Duration(Hrs): **Theory** 0 3 **Practical** 0 0

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 3

5 Semester: ☑ **Autumn** ☐ **Spring** ☐ **Both**

6 Pre-Requisite: Basic Knowledge of Networking and Cryptography

7 Subject Area: Network Security

8 Objective: To familiarize students with the techniques used in network security, cyber security and Cyber law.

9 Course Outcome: A student who successfully fulfills the course requirements will be able to-

- **a.** Understand the Importance of Network security.
- **b.** Students will understand the methods and protocols used in Network Security.
- **c.** Understand the concept of ISO security architecture.
- **d.** Understand the Concept of Cyber Law and Cyber Security.
- **e.** Understand the Scope and Object of the IT Act.
- **e.** Understand the basic and advanced concepts of distributes attacks.

10 Details of the Course:

Unit No.	CONTENT	CONTACT HOURS
1	**Introduction to Network security:** Introduction to Network Security, Goals of Network Security, ISO security Architecture: Attacks, Categories of Attacks, Network Security Services & Mechanisms. Authentication Applications: Kerberos, X.509 Directory Authentication Service.	8
2	**Application Layer Security:** Security threats and countermeasures SET protocol, Electronic Mail Security, Pretty Good Privacy (PGP), S / Mime. **Transport Layer Security:** Secure Socket Layer & Transport Layer Security, Wireless Transport layer security.	10

3	**IP Security:** Authentication Header, Encapsulating Security Payloads. **System Security:** Intruders, Intrusion Detection System, Viruses, Firewall Design Principles, Trusted Systems, OS Security, Program Security.	8
4	**Introduction to Cyber Law:** Cyber, Cyber Crime, Cyber criminals, Cyber Law. **Object and Scope of the IT Act:** Genesis, Object, Scope of the Act, E-Governance and IT Act 2000, Legal recognition of electronic records, Legal recognition of digital signature, Use of electronic records and digital Signatures in Government and its agencies. IT Act in detail. **Basics of Network Security**: IP Addresses, Port numbers and sockets, Hiding and Tracing IP Addresses. **Scanning:** Traceroute, Ping sweeping, Port Scanning, ICMP scanning, Fingerprinting: active and passive email.	10
5	**Different kinds of buffer overflow attacks:** Stack overflows, string overflows, Heap and Integer overflows. **Internal Attacks:** Emails, Mobile Phones, Instant Messengers, FTP Uploads, Dumpster Diving, Shoulder Surfing. **DOS Attacks:** Ping of Death, Teardrop, SYN flooding, Land Attacks, Smurf Attacks, UDP flooding, Hybrid DOS Attacks, Application Specific, Distributed Dos Attacks.	9
	TOTAL	**45**

11 Suggested Books:

Sl. NO.	**NAME OF AUTHERS/BOOKS/PUBLISHERS**	**YEAR OF PUBLICATION**
1	William Stallings, "Cryptography and Network Security: Principles and Practice", Prentice Hall, New Jersey.	2002
2	Atul Kahate, "Cryptography and Network Security", TMH	2008
1	Zeinab Karake Shalhoub, Sheikha Lubna Al Qasimi Cyber Law And Cyber Security In Developing And Emerging Economies.	2010
2	Sunit Belapure and Nina Godbole,Cyber Security: Understanding Cyber Crimes, Computer Forensics And Legal Perspectives.	2010
3	Gerald R Ferrera, Margo E K Reder, Stephen D Lichtenstein,Cyber Law: Text and Cases.	2011

NAME OF DEPARTMENT: Computer Applications

Subject Name: Web Development **Subject Code:** TBC 603

Course Name: Bachelor of Computer Application

1 Contact Hours: 45 **L** 3 **T** 0 **P** 2

2 Examination Duration(Hrs): **Theory** 0 3 **Practical** 0 0

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 3

5 Semester: ☑ **Autumn** ☐ **Spring** ☐ **Both**

6 Pre-Requisite: Knowledge of Web Programming.

7 Subject Area: Web Programming

8 Objective: To familiarize students with advance concepts of web development.

9 Course Outcome:

CO 1 Develop Server side programs using Servlet.
CO 2 Develop Web Applications using JSP.
CO 3 Build well-formed XML Document.
CO 4 Build dynamic web pages using AJAX.
CO 5 Learn and understand the concept of Web Applications using advance concepts of PHP.
CO 6 Implement the JSP, Servlet, PHP, and AJAX to solve web development problems.

10 Details of the Course:

Unit No.	CONTENT	CONTACT HOURS
1	**Servlets** Introduction of Servlet, Introduction of CGI, Advantages of Servlets over CGI, Http request, Get VS Post, Web Server Vs Application Server, Servlet's Life Cycle, Steps to create Servlet Application, How Servlet works, War file, Servlet Request, ServletConfig, ServletContext, GenericServlet, HttpSevlet, Request Dispatcher, Send Redirect, Cookies.	**10**
2	**Java Server Pages (JSP)** Advantages of JSP over Servlet, JSP Lifecycle, How to create and run JSP page, JSP Scripting Elements, Implicit Objects, Directive Elements, Exception Handling in JSP, Action Tags.	**8**
3	**XML and AJAX** Introduction of XML, Features of XML, Advantages and Disadvantages of XML, HTML VS XML, XML Tree, XML DTD, and XML DOM. What is AJAX, Where it is used, Synchronous VS Asynchronous, XML HttpRequest, How AJAX work, AJAX Request and Response?	**10**
4	**Advance PHP** Overview, PHP Strings, Math, Form Handling, include vs require, cookie,	**8**

	session, File Handling, and MYSQLi.	
5	**Module Design** Login and Registration Page, Change Password and Forgot Password Page, Log out page, Save data with system date and time, Calculate age as per the given DOB, Authentication as per User Type, Partial Searching, CRUD operations.	**9**
	TOTAL	**45**

11 Suggested Books:

Sl. NO.	NAME OF AUTHERS/BOOKS/PUBLISHERS	YEAR OF PUBLICATION
1.	Bryan Basham, Kathy Sierra, Bert Bates / Head First Servlets and JSP 2nd Edition / O'Reilly Media	2008
2.	Sas Jacobs / Beginning XML with DOM and AJAX / Apress	2006
3.	Steven Holzner / AJAX "A Beginners guide" / McGraw-Hill Education	2008
4.	Luke Welling & Laura Thomson / PHP and MySQL Web Development4th Edition / Addison Wesley	2008
5.	Alan Forbes / The Joy of PHP 5th Edition / Plum Island Publishing LLC	2012

Changes Proposed as follows:

New Introduced

NAME OF DEPARTMENT: Computer Applications

Subject Name: Cloud Computing **Subject Code:** TBC604(2)

Course Name: Bachelor of Computer Application

1 Contact Hours: 48 **L** 3 **T** 1 **P** 0

2 Examination Duration(Hrs): **Theory** 0 3 **Practical** 0 2

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 4

5 Semester: ☐ **Autumn** ☑ **Spring** ☐ **Both**

6 Pre-Requisite: Introductory knowledge of networking and distributed systems.

7 Subject Area: Computer Application

8 Objective: **To introduce the students with the idea of cloud computing and its application**

9 Course Outcome: A student who successfully fulfills the course requirements will be able to

a. Understand Cloud deployment models and services
b. Describe various storage architectures.
c. Describe the concepts of virtualization.
d. Explain the various vendors of a secure Cloud model.
e. Describe security concerns for cloud.

10 Details of the Course:

Unit No.	CONTENT	CONTACT HOURS
1	Cloud computing Fundamentals – Short history of cloud computing, CloudStorage, Pros and Cons of cloud computing, Benefits from cloudcomputing.Basic and Essential characteristic of cloud computing model.Use and application of Cloud computing.	**10**
2	**Cloud Platform Architecture**: NIST cloud reference architecture, Cloud Computing and service Models: IAAS, PAAS, SAAS, Cloud Deployment models, public, private, hybrid and community models and their comparative study.	**10**

3	**Storage Architectures:** Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system. Prevalent Storage technologies like DAS, RAID, NAS and SAN architectures, Data centers for Cloud Computing.	**10**
4	**Virtual Machines and Virtualization :** Introduction, brief history of virtualization, Need for virtualization, Concept of hypervisor and its types, Virtualization architecture, pros and cons of virtualization, Types of Virtualization, Hardware Virtualization, Software Virtualization, Memory Virtualization, Storage Virtualization Network Virtualization	**10**
5	**Security Recommendations and Software Environments:** Cloud Security Recommendations ,Virtualization Security Recommendations, Introduction to AWS, Key Amazon offerings, Google App Engine	**8**
	TOTAL	**48**

11 Suggested Books:

Sl. NO.	**NAME OF AUTHERS/BOOKS/PUBLISHERS**	**YEAR OF PUBLICATION**
1	J. W. Rittenhouse and J. F. Ransome "Cloud Computing, Implementation, Management, and Security", CRC Press.	2010
2	A. S. Tanenbaum,"Modern Operating Systems, 3rd Edition", by Andrew S. Tanenbaum, Prentice Hall.	2007
3	G. Reese, "Cloud Application Architectures", O.Reilly	2009
4	D.S. Linthicum "Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide", Addison Wesley	2009

Changes Proposed as follows:

Unit 1: Removed - Cloud Services -Need for Web-Based Application – The cloud Service Development – Cloud Service Development Types – Cloud Service development tools.

Added - Basic and Essential characteristic of cloud computing model , Use and application of Cloud computing.

Unit 2: Removed - Application Security -Web Application, Application Weaknesses, Attack Methods, What is Web Application Security, application security layer, vulnerability distribution, Why Web Application Risks Occur, Security solutions, Applications in cloud environments Security Recommendations.

Added- **Cloud Platform Architecture**: NIST cloud reference architecture, Cloud Computing and service Models: IAAS, PAAS, SAAS, Cloud Deployment models, public, private, hybrid and community models and their comparative study.

Unit 3: Removed - Encryption and Key Management -Encryption for Confidentiality and Integrity, Encrypting data at rest, Key Management Lifecycle, Cloud Encryption Standards, Recommendations.

Added- **Storage Architectures:** Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system. Prevalent Storage technologies like DAS, RAID, NAS and SAN architectures, Data centers for Cloud Computing.

Unit 4: Removed - Identity and Access Management - Identity and Access Management in the cloud, Identity and Access Management functions, Identity and Access Management (IAM) Model, Identity Federation, Identity Provisioning Recommendations, Authentication for SaaS and Paas customers, Authentication for IaaS customers, Introducing Identity Services, Enterprise Architecture with IDaaS, IDaaS Security Recommendations

Added- **Virtual Machines and Virtualization :** Introduction, brief history of virtualization, Need for virtualization, Concept of hypervisor and its types, Virtualization architecture, pros and cons of virtualization, Types of Virtualization, Hardware Virtualization, Software Virtualization, Memory Virtualization, Storage Virtualization Network Virtualization

Unit 5 : Removed - Virtualization - Hardware Virtualization, Software Virtualization, Memory Virtualization, Storage Virtualization, Data Virtualization, Network Virtualization, Virtualization Security Recommendations

Added- **Security Recommendations and Software Environments:** Cloud Security Recommendations ,Virtualization Security Recommendations, Introduction to AWS, Key Amazon offerings, Google App Engine**.**