

COURSE TITLE	Cloud Computing
COURSE CODE	BITC1622M
SEMESTER	6 th
COURSE TYPE	MAJOR/MINOR
CREDITS	06(4+2 credits)

Course Objectives:

- Understand the fundamental concepts of cloud computing.
- Explore various cloud service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).
- Gain insight into different cloud deployment models: public, private, hybrid, and community clouds.
- Learn about virtualization technologies and their role in cloud computing.
- Understand cloud security challenges and best practices.

UNIT I (15 Hours)
CLOUD COMPUTING FUNDAMENTALS

Cloud Computing: Introduction, Key characteristics, goals of cloud computing; Benefits of Cloud Computing: flexibility, scalability, portability; Drawbacks of cloud computing: dependability, security, reliability, availability.

UNIT II (15 Hours)
CLOUD COMPONENTS AND SERVICES

Major components of cloud computing: application, client, infrastructure, platform, service, storage, processing power.
 Private, public, and hybrid cloud. Cloud computing platforms: IaaS, Example Amazon EC2; PaaS, Example Google App Engine, Microsoft Azure; SaaS;

UNIT III (15 Hours)
CLOUD ECONOMICS

Cloud Economics: Economics of private clouds, Software productivity in the cloud, Economies of scale: public vs. private clouds: Economics of choosing a Cloud platform for an organization, based on application requirements, economic constraints and business needs, SLA document, Virtualization and Resource Provisioning in Clouds.

UNIT IV (15 Hours)
CLOUD TECHNOLOGIES & CLOUD SECURITY

Technologies and the processes required when deploying web services: Web services: XML, SOAP, REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Security issues, Solutions to threats, Disaster recovery.

TEXT BOOKS / REFERENCES

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1. Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Kris Jamsa, Jones & Bartlett Publishers, Paper back edition, 2013
2. Gautam Shroff, "Enterprise Cloud Computing Technology Architecture Applications", Cambridge University Press; 1 edition, [ISBN: 9780521137355], 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach" McGrawHill Osborne Media; 1 edition [ISBN: 0071626948], 2009.
4. Dimitris N. Chorafas, "Cloud Computing Strategies" CRC Press; 1 edition [ISBN: 1439834539], 2010.
5. Cloud computing for dummies- Judith Hurwitz , Robin Bloor , Marcia Kaufman , Fern Halper, Wiley Publishing, Inc, 2010
6. Cloud Computing (Principles and Paradigms), Edited by Rajkumar Buyya, James Broberg, Andrzej Goscinski, John Wiley & Sons, Inc. 2011

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COURSE TITLE	Software Engineering
COURSE CODE	BITC2622M
SEMESTER	6 th
COURSE TYPE	MAJOR
CREDITS	06(4+2 credits)

Course Objectives:

- Understand the principles and concepts of software engineering.
- Gain proficiency in software development methodologies.
- Acquire practical skills in designing, implementing, testing, and maintaining software systems.
- Develop teamwork, communication, and project management skills through group projects.
- Explore emerging trends and technologies in software engineering.
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UNIT-I

Introduction (15 Hours)

The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Introduction to SDLC, SDLC phases- study, analysis, design, development, testing, implementation, maintenance. Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Capability Maturity Model Integration (CMMI).

UNIT-II

Requirement Analysis (15 Hours)

Requirement Elicitation, Software requirement specification (SRS) , Building the Analysis Model, Elements of the Analysis Model, Negotiating Requirements, Validating Requirements ,Need for SRS, Characteristics and Components of SRS.

UNIT-III

Software Project Management (15 Hours)

Estimation in Project Planning Process, Project Scheduling (PERT and CPM). Risk Identification, Risk Projection and Risk Refinement, RMMM Plan. Software Quality and Assurance, Software Metrics.

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UNIT-IV

Design Engineering (15 Hours)

Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modelling Component Level Design. Data Flow Diagram (DFD).

Software Testing Fundamentals, Types- (Validation Testing, System testing, Unit Testing, Black-Box Testing, White-Box Testing, Basis Path Testing).

Text Book:

R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGraw- Hill, 2009.

Reference Books:

1. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Narosa Publishing House, 2003.
2. K.K. Aggarwal and Y. Singh, Software Engineering (2nd Edition), New Age International Publishers, 2008.
3. I. Sommerville, Software Engineering (8th edition), Addison Wesley, 2006.
4. D. Bell, Software Engineering for Students (4th Edition), Addison-Wesley, 2005.
5. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

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Course Title: Lab Software Engineering

S. No Practical Title

1. Problem Statement
 - Process Model
2. Requirement Analysis:
 - Creating a Data Flow
 - Data Dictionary, Use Cases
3. Project Management:
 - Computing FP
 - Effort
 - Schedule, Risk Table, Timeline chart
4. Design Engineering:
 - Architectural Design
 - Data Design, Component Level Design
5. Testing:
 - Basis Path Testing

Sample Projects:

1. Criminal Record Management: Implement a criminal record management system for jailers, police officers and CBI officers
2. DTC Route Information: Online information about the bus routes and their frequency and fares.
3. Car Pooling: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system . Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

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COURSE TITLE	Internship
COURSE CODE	BITC3622M
SEMESTER	6 th
CREDITS	2 credits

List of Internships for 6th semester

- **Internship in Software Development:** Working on designing, coding, and testing software applications.
- **Internship in Quality Assurance (QA):** Testing software applications to ensure they meet quality standards.
- **Internship In Cloud Computing:** Working with cloud platforms like AWS, Azure, or Google Cloud, and learning about cloud architecture and services.
- **Internship in Cyber security:** Learning about securing networks, systems, and applications from cyber threats.
- **Internship in Network Engineering:** Assisting in designing, configuring, and maintaining computer networks.

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