



**Marwadi**  
**University**  
Marwadi Chandarana Group

**Marwadi University**  
**Faculty of Engineering and Technology**  
**Department of Information and Communication Technology**

Department of Information and  
Communication Technology

FoET, Marwadi University

Batch 2020-24(Semester 8)

Teaching Assessment Scheme & Syllabus

B. Tech. Year IV, Sem VII									Evaluation Scheme					
Subject Code	Subject Name	Category			Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/		Total Marks
		AICTE	CBCS	Skill	Theory	Tutorial	Practical		ESE(E)	IA	CSE	Viva	Term Work	
01CT0715	Capstone Project	PROJ-ICT	EE	Skill	0	0	6	3	0	0	0	50	50	100
01CT1702	Information Theory and Coding	PCC - ICT	PC		3	2	0	5	50	30	20	25	25	150
01CT0716	Mobile and Pervasive computing	PCC - ICT	PC		4	0	2	5	50	30	20	25	25	150
01CT0704	Management Information System	HSMC	GN-UC		3	0	0	3	50	30	20	0	0	100
01CT07XX	Department Elective - 5	PEC - ICT	PEC	Skill	3	0	2	4	50	30	20	25	25	150
01CT07XX	Department Elective - 6	PEC - ICT	PEC	Skill	3	0	2	4	50	30	20	25	25	150
	<b>Total</b>		<b>30</b>		<b>16</b>	<b>2</b>	<b>12</b>	<b>24</b>	<b>250</b>	<b>150</b>	<b>100</b>	<b>150</b>	<b>150</b>	<b>800</b>

**Department Elective - 5,6**

- 1) 01CT0717 - VLSI Physical Design
- 2) 01CT0719 - Adhoc Wireless Networks
- 3) 01CT0720 - Cloud Developing
- 4) 01CT0722 - Deep Learning
- 5) 01CT0724 - Compiler Design

- 6) 01CT0718 - FPGA Based System Design
- 7) 01CT0726 - Software Defined Networks
- 8) 01CT0721 - Blockchain
- 9) 01CT0723 - Information Retrieval and Natural Language Processing
- 10) 01CT0725 - Advanced Database

B. Tech. Year IV, Sem VIII									Evaluation Scheme					
Subject Code	Subject Name	Category			Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/		Total Marks
		AICTE	CBCS	Skill	Theory	Tutorial	Practical		ESE(E)	IA	CSE	Viva	Term work	
01CT1801	Project	PROJ-ICT	EE	Skill	0	0	26	13	0	0	0	100	100	200
01CT08XX	Department Elective - 7	PEC - ICT	PEC	Skill	3	0	0	3	50	30	20	25	25	150
01CT08XX	Department Elective - 8	PEC - ICT	PEC	Skill	3	0	0	3	50	30	20	25	25	150
	<b>Total</b>		<b>32</b>		<b>6</b>	<b>0</b>	<b>26</b>	<b>19</b>	<b>100</b>	<b>60</b>	<b>40</b>	<b>150</b>	<b>150</b>	<b>500</b>

**Department Elective - 7,8 (MOOC)**

- 1) 01CT0818 - Analog Circuit Design
- 2) 01CT0814 - Spread spectrum communications
- 3) 01CT0828 - Cloud Architecture
- 4) 01CT0816 - Advance Machine Learning
- 5) 01CT0821 - Object Oriented Analysis and Design

- 6) 01CT0819- RTOS
- 7) 01CT0820 - Introduction to 5G
- 8) 01CT0811 - Introduction to DevOps Tools
- 9) 01CT0817 - Advance Data Analytics
- 10) 01CT0822 - Soft Computing

- 11) 01CT0823- Cloud Technical Essentials
- 12) 01CT0824 - Security Essentials
- 13) 01CT0825 - Machine Learning Essentials
- 14) 01CT0826 - Human Computer Interaction
- 15) 01CT0827 - Software Testing

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HOD-ICT

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29/05/2023.

**Teaching and Examination Scheme\***  
**INFORMATION AND COMMUNICATION TECHNOLOGY**  
**Sem - 8**

Academic Year : 2324

Print Date : 29/05/2023

Subject Code	Subject Name	Sub.Type	Dept.Level	Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
				Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
01CT0811	INTRODUCTION TO DEVOPS TOOLS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0814	SPREAD SPECTRUM COMMUNICATIONS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0816	ADVANCE MACHINE LEARNING	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0817	ADVANCE DATA ANALYTICS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0818	ANALOG CIRCUIT DESIGN	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0819	RTOS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0820	INTRODUCTION TO 5G	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0821	OBJECT ORIENTED ANALYSIS AND DESIGN	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0822	SOFT COMPUTING	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0823	CLOUD TECHNICAL ESSENTIALS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0824	SECURITY ESSENTIALS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0825	MACHINE LEARNING ESSENTIALS	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0826	HUMAN COMPUTER INTERACTION	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0827	SOFTWARE TESTING	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT0828	CLOUD ARCHITECTURE	Elective	Yes (faculty)	3	0	0	3	50	30	20	25	25	150
01CT1801	PROJECT	Mandatory		0	0	26	13	0	0	0	100	100	200

We have verified all details of above subjects: Syllabus, Teaching Scheme and Marks etc.

Online Time Table Coordinator

Dept. Coordinator/ HoD

**Subject Code: 01CT0811**

**Subject Name: Introduction to DevOps Tools**  
**(MOOC Credit)**

**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The Objective of this course is to give students an understanding of devOps technology. Students will be able to understand the working of devOps tool and its working with other operations of organization.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Diagnose a team's delivery pipeline and bring forward prioritized recommendations to improve it
2. Explain the skill sets and roles involved in DevOps and how they contribute toward a continuous delivery capability
3. Review and deliver automation tests across the development stack
4. Explain the key jobs of system operations and how today's leading techniques and tools apply to them
5. Explain how high-functioning teams use DevOps and related methods to reach a continuous delivery capability
6. Facilitate prioritized, iterative team progress on improving a delivery pipeline

**Pre-requisite of course:**

NA

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

Understating of DevOps & DevOps Process, Git introduction and installation, Configure User Information in GIT, GIT Text Editor, Compare Stage Area with Local Repository in GIT, Architectural Overview of Jenkins, Code Pipeline, Configure Jenkins with GIT & Maven, Remote Build Trigger in Jenkins, Jenkins Job DSL with Maven Project, Jenkins as a code pipeline, Docker File Instructions & Construction Commands, Stop-Remove the Containers, Docker CLI Monitoring, Docker Swarm, Kubernetes, Kubernetes Node, Workflow, HELM on Kubernetes, AWS VPC, EC2 Instance Auto scaling, EKS Cluster Using AWS.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT0816**

**Subject Name: Advance Machine Learning**

**(MOOC Credit)**

**B. Tech. Year – IV (Semester VIII)**

**Objectives:** The course has been kept flexible so that Instructor can choose special topics which have evolved or added in this area. It has been specially designed in this way, to cover up all the latest tools, research and industry relevant content and the gaps due to the fast changes happening in the technology.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. To familiarize and learn about the latest trends and research in the field.
2. To equip themselves with the conceptual and practical experience of few latest methods, tools, technologies or algorithms in Machine Learning.
3. Understand the mathematics necessary for constructing novel machine learning solutions.
4. Be able to design and implement various machine learning algorithms in a range of real-world applications

**Pre-requisite of course:** Programming, Algorithms, Data Structures, Machine Learning, Artificial Intelligence

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
3	0	0	03	50	30	20	00	00	100

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

Major focus of the course will be on Relational Machine Learning, Bayesian Machine Learning, Graph learning, Reinforcement learning, Causal inference, handling bias and variance in the dataset, variational methods, etc. The course includes understanding the implementation of Machine Learning concepts to predict, classify, cluster or generate from the real time data dealing with different fields like Bioinformatics, Transportation, Logistics, Security, Education, Healthcare, Environment, Military, etc.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-



**Subject Code: 01CT0818**  
**Subject Name: Analog Circuit Design**  
**(MOOC Credit)**  
**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The Objective of this course is to give students an understanding of Analog Circuit Design.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Design analog circuits with industry standard specifications
2. Analyze error budgeting of various analog circuits
3. Design current source for various applications
4. Understand detail working of different types of ADC
5. Do transformer design and heat sink design

**Pre-requisite of course:**

Basics of Electronics Engineering

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

This course includes the analog circuit design concepts in detail. It covers basic design using transistors and opamp. It covers opamp based voltage regulator as a primary design and covers more opamp based designs which are applications in industry. The course also includes the calculations of probable errors in design with necessary error budgeting concepts which helps in critical design requirements. The course also includes design of current source and 4 to 20ma current transmitter to make students aware with industrial



need of such designs. Various types of Analog to Digital converters are also discussed in detail.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT0819**  
**Subject Name: Real Time Operating System**  
**(MOOC Credit)**

**B. Tech. Year – IV (Semester VIII)**

**Objective:**

To acquire knowledge and skills about concepts related to real time OS such as scheduling techniques, threads, inter-thread communications, memory management, different types of scheduling, Common standards and commercial real time operating systems, multiprocessor and distributed system management.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Describe the fundamental concepts of RTOS.
2. Understand the resource sharing among real time tasks and protocols.
3. Develop programs for real time operating systems using Free RTOS.
4. Understand multiprocessor and distributed systems management.
5. Analyze various trace tools for real time operating systems.
6. Design Real World embedded system application with RTOS.

**Pre-requisite of course:**

Basic of Microcontroller programming, Embedded Concepts

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

### **Content Overview:**

Introduction, Characteristics of Real –time system Embedded Systems, Types of real time tasks, Basics of Real Time- Task Scheduling, Cyclic executives, Cyclic Scheduler, Frame Size Constraints, Event Driven Scheduling, Rate Monotonic Scheduler, Challenges associated with RMA scheduling, Deadline monotonic scheduling, Resource sharing among real time tasks, Highest locker, Priority Inheritance and Priority Ceiling Protocols, Analysis of Priority Ceiling protocol, Handling Task dependencies, Embedded Firmware Design Approaches, Super-loop-based approach, Embedded Operating System based approach, Programming in EmbeddedC, Integrated development environment (IDE), Overview of IDEs for Embedded System Development, Introduction to multiprocessor and distributed systems, Static allocation of tasks, Dynamic allocation of tasks, Centralized clock synchronization in distributed RT systems, Distributed clock synchronization in RT systems, Unix based real time operating systems, Windows as RTOS, Basics of real time communication, Real-Time communication in LAN, Free RTOS trace analyzer setup, Analysis of valuable dynamic behavior information , troubleshoot, optimize Free RTOS firmware. Visualizing the real-time execution of tasks and ISRs, including Free RTOS calls and UserEvents.

### **Supplementary Resources:**

1. <https://www.st.com/en/embedded-software/freertos-kernel.html>
2. <https://www.freertos.org/portstm32iar.html>
3. <https://nptel.ac.in/courses/106105229>

### **Suggested Theory distribution:**

The suggested theory distribution as per Bloom’s taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT0821**

**Subject Name: OOAD**  
**(MOOC Credit)**

**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The objective of the course is to make proficient students in software modelling & design using object-oriented concepts.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Understand the importance and basic concepts and of object oriented modelling.
2. Specify, analyze and design the use case driven requirements for a particular system
3. Model the event driven state of object and transform them into implementation specific layouts.
4. Identify, Analyze the subsystems, various components and collaborate them interchangeably.

**Pre-requisite of course:**

Students should have detailed Knowledge of Object Oriented Programming & Data Structure

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

Introduction to Object Oriented Modelling, Object Oriented Modelling, Characteristics Object Oriented Modelling, Class and Objects Links and Association, UML: Introduction, Object Model Notations: Basic Concepts, Structural Diagrams, Behavioural Diagrams, Modelling with Objects, System Design: System Design: An Object Oriented Approach, Breaking into Subsystems, Objects, Handling Boundary Conditions. Object Design for Processing Defining Classes and delegation of

Responsibilities to Methods, Advance Modelling Concepts, Dynamic Modelling, Events, State and State Diagram, Functional Models, Data Flow Diagrams, Features of a DFD, Design flaws in DFD A Functional model.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT0823**  
**Subject Name: Cloud Technical Essentials**  
**(MOOC Credit)**  
**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The Objective of this course is to give students a basic understanding of cloud computing, services, applications and uses. Students will build highly available, scalable, and cost-effective application step-by-step.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Apply the informed decision about when and how to use core AWS services.
2. Use the AWS services to compute, storage, and database to different use cases.
3. Understand the cloud security with a review of AWS' shared responsibility mode.
4. Understand the AWS Identity and Access Management (IAM).
5. Use the AWS to optimize the cloud infrastructure.

**Pre-requisite of course:** NA

**Restrictions:** This course is only offered to the students who have not taken the elective course of Cloud Computing during their Semester 6 and Cloud developing their semester 7.

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

AWS Overview and Security, definition of cloud computing, cloud value proposition, differentiate between workloads that run on-premises versus in the cloud, how to create an

AWS account, Amazon Web Services, basic components of Amazon Elastic Compute Cloud (Amazon EC2) architecture, how to differentiate between a container and a virtual machine, features and advantages of using serverless technologies, Amazon Virtual Private Cloud (Amazon VPC), Storage & Databases on AWS, how to optimize solutions on AWS, how to differentiate between vertical scaling and horizontal scaling, Amazon EC2 Auto Scaling, Configure High Availability for your Application.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-



**Subject Code: 01CT0826**

**Subject Name: Human Computer Interaction  
(MOOC Credit)**

**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The Objective of this course is to give students an understanding of an interface and what role a designer plays in creating a user interface. They will learn how to design and articulate meaning using color, type, and imagery is essential to making interfaces function clearly and seamlessly. Students will build solutions for problems in society, understanding needs of the people, finding gaps in needs and existing technological solutions.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Understand the key formal elements of clear, consistent, and intuitive UI design.
2. Apply the learned skills to the design of a static screen-based interface.
3. Use the elements of UI/UX.
4. Integrate the elements of UI/UX.
5. Understand black-box and white-box testing, describing the benefits and use of both black-box and white-box testing.

**Pre-requisite of course:** Basic knowledge of OOP.

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

Introduction to Human Centered Design, Human Centered Design Process, Welcome to the UI/UX Design Specialization, Peer Review, Peer Review Tips, How to apply feedback, Required Tools, About CalArts and the Program in Graphic Design, Instructor Presence and Staff Support, Share stories and learn from user research, find

themes and cluster them, User Interface The Relationship Between UI and UX , Roles in UI/UXA Brief Historical Overview of Interface Design, Interface Conventions: Theory Interface Conventions: Application Template vs Content Aesthetics & Functionality, Mapping, Testing, Envisioning Mapping Content Mapping Interaction Non-Visual Paper Prototyping Non-Visual User Testing Sitemap Look and Feel/Visual Research, Design Before Design, Look and Feel, Language as a design tool, Color and Shape, Imagery, Typography, Icons, Functionality, Speed and Style, Composition and Structure, Buttons, Not Buttons, States and Changes, Conventions and Expectations, Structure and Grids, Platforms and Screen Sizes.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT0827**  
**Subject Name: Software Testing**  
**(MOOC Credit)**  
**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The Objective of this course is to give students an understanding of fundamental principles and processes of software testing. Students will learn about creation of test cases and run them using an automated testing tool. They will also be able to write and recognizing good test cases, including input data, and expected outcomes.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Understanding the goal of testing.
2. Use appropriate test terminology in communication, specifically: test fixture, logical test case, concrete test case, test script, test oracle, and fault.
3. Measure test adequacy using statement and branch coverage.
4. Assess the fault-finding effectiveness of a functional test suite using mutation testing.
5. Understand black-box and white-box testing, describing the benefits and use of each within the greater development effort.
6. Craft unit and integration test cases to detect defects within code and automate these tests using JUnit.

**Pre-requisite of course:**

Basic knowledge of OOP.

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

Introduction, challenges of software testing, Test, Automation: Using a test framework, Automation: Writing JUnit tests, Testing Foundations, Dependability Definitions, Testing Principles, The "V Model" of Software Development, Validation and Verification in the "V Model", Structural Testing, Mutation Testing, Test Plan, Stages of Software Testing Process, Risk-based Test Planning, Software Defect Reports: Analysis and Report, Software Defect Reports: Track, Retest, and Close, Test Doubles: Introduction, Test Doubles: Input, Test Doubles: Output, Assessing Adequacy and Code Coverage Analysis with JaCoCo, Flakey Tests and How to Avoid Them. Web and Mobile Testing with Selenium.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT0828**  
**Subject Name: Cloud Architecture**  
**(MOOC Credit)**  
**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The Objective of this course is to give students an understanding of cloud architecture and its security issues.

**Credits Earned:** 03 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Make architectural decisions based on AWS architectural principles and best practices.
2. Use AWS services to make infrastructure scalable, reliable, and highly available.
3. Use AWS managed services to enable greater flexibility and resiliency in an infrastructure.
4. Increase performance and reduce cost of a cloud infrastructure built on AWS.
5. Use the AWS Well-Architected Framework to improve architectures that use AWS solutions.

**Pre-requisite of course:**

Basic Knowledge of Cloud Computing.

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
03	00	00	03	50	30	20	25	25	150

The course is offered with the objective of credit transfer by learning through MOOC course. The selection of the online course should reflect the syllabus content, mentioned below. The MOOC course must be of minimum 36 hours with appropriate assessment scheme.

**Content Overview:**

Welcome to AWS Academy Cloud Architecting, Introducing Cloud Architecting, Define cloud architecture, Define how to design and evaluate architectures using the AWS Well-Architected Framework, Adding a Storage Layer, Recognize the various Amazon S3 storage classes and cost Considerations, Adding a Compute Layer, Adding a Database

Layer, Creating a Networking Environment, Connecting Networks, Securing User and Application Access, Implementing Elasticity, High Availability, and Monitoring, Automating Your Architecture, Caching Content, Building Decoupled Architectures, Building Microservices and Serverless Architectures, Planning for Disaster.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	30%	-	-

**Subject Code: 01CT1801**

**Subject Name: Project**

**B. Tech. Year – IV (Semester VIII)**

**Objective:**

The subject provides hands-on learning experience to the students with the opportunity to explore a problem or issue of personal or professional interest and to address that problem or issue through focused study and applied research under the direction of a faculty member or industrial guide. This course also provides platform to implement learnt concepts in various subjects in case of project design and to provide in-depth exposure in the field of software, data analytics, embedded, VLSI, networking, and security in case of industrial training. It is also useful to enhance students' ability to think critically and creatively, to solve practical problems, to make reasoned and ethical decisions, and to communicate effectively.

**Credits Earned:** 13 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. Investigate the chosen topic in depth
2. Apply the concepts and theories learnt in previous subjects
3. Apply the various methodologies to design project for specific application
4. Explore the new ideas & the possible areas to work ahead
5. Sharpen the skills in specific direction

**Pre-requisite of course:**

Basic knowledge of all academic subjects and readiness to explore new things

**Teaching and Examination Scheme:**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
00	00	26	13	00	00	00	100	100	200

**Contents:**

Unit	Topics
1	The Project work should include appropriate elements of engineering standards, design, analysis, modeling, simulation, experimentation, prototyping, software development, research etc. as per the requirement of the project definition
2	Exploration of various domains of the discipline and finalization of domain for project or Industrial Training



3	Identification of proposed project definition by student or students' group in coordination with faculty guide or industrial mentor to address issue related to economic, environmental, social, political, ethical, health & safety, manufacturability, sustainability, management, science etc.
4	Student's presentation on selected topic with outcomes of the project/Industrial Training and approval by project approval panel
5	Intermediate semester presentations include block diagram, flow chart, micro level block diagram, schematic, required hardware or software, features and application of project at regular interval
<b>Total Hours: 26 / week</b>	

#### **Assessment of project work:**

<b>In semester evaluation</b> Evaluation by project evaluation committee from institute (50% marks) and project guide (50% marks)	<b>Assessment tool</b>	<b>Review – I 1st month of semester</b>	<b>Review – II Mid of semester</b>
	TW Marks Distribution	50 Marks	50 Marks
<b>End semester evaluation</b> Evaluation by project evaluation committee from institute (50% marks) and project guide (50% marks)	<b>Assessment tool</b>	<b>Viva Exam</b>	
	Viva Marks Distribution	100 Marks	

#### **Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	5%	15%	15%	20%	40%