MANIPAL
ACADEMY *of* HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

INSPIRED BY LIFE

Master of Engineering - ME (Cloud Computing)

Syllabus

July 2023 Onwards

MANIPAL SCHOOL OF INFORMATION SCIENCES
MANIPAL ACADEMY OF HIGHER EDUCATION
MANIPAL – 576104.KARNATAKA. INDIA.

Program Educational Objectives / Outcomes (PEOs)

PEO 1: Develop advanced knowledge and understanding of the theories, concepts, and principles related to Cloud Computing, including virtualization, distributed systems, cloud networks, security, microservices, and cloud infrastructure management services.

PEO 2: Apply critical thinking and problem-solving skills to address complex challenges in cloud computing such as scalability, resource scheduling, performance optimization and data management.

PEO 3: Gain practical, hands-on experience with global cloud provider services, DevOps tools, automation and container orchestration services through coursework and applied research experiences.

Program Objectives / Outcomes (POs)

PO 1: An ability to independently carry out research /investigation and development work to solve practical problems.

PO 2: An ability to write and present a substantial technical report/document.

PO 3: An ability to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

PO 4: An ability to design, develop scalable, highly available and fault-tolerant cloud solutions, services for business needs and implement well architected cloud architectures based on theoretical principles, ethical considerations, and detailed knowledge of the underlying infrastructure, applications and data.

P0 5: An ability to demonstrate knowledge of securing cloud resources, data and infrastructure and apply DevOps best practices to automate software development life cycle.

Program Structure

Course Code	Course Name	Lecture	Tutorial	Practical	Credit	Duration of Exam in Hrs	Internal 50	External 50	Total 100
ME (Cloud Computing) – I Semester									
		No. of Hours/week					**Maximum Marks**		
CDC 5001	DevOps for Cloud	3	-	-	3	3	50	50	100
CDC 5101	Cloud Application with JAVA and Database	3	-	-	3	3	50	50	100
CDC 5102	Cloud Architecture and Management	3	-	-	3	3	50	50	100
CDC 5104	Linux and Data Structures	3	-	-	3	3	50	50	100
	Elective – I	3	-	-	3	3	50	50	100
CDC 5051	DevOps for Cloud Lab	-	-	3	1	3	50	50	100
CDC 5151	Cloud Application with JAVA and Database Lab	-	-	3	1	3	50	50	100
CDC 5152	Cloud Architecture and Management Lab	-	-	3	1	3	50	50	100
CDC 5154	Linux and Data Structures Lab	-	-	3	1	3	50	50	100
	Elective - I Lab	-	-	3	1	3	50	50	100
MPT 5100	Mini Project - I	-	-	-	4	-	100	-	100
PSD 5100	Professional Skill Development - I	-	-	-	1	-	100	-	100
Total		**15**	**-**	**15**	**25**				

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ME (Cloud Computing) – II Semester									
Course Code	Course Name	No. of Hrs. / week				Duration of Exam in Hrs	Maximum Marks		
		Lecture	Tutorial	Practical	Credit		Internal 50	External 50	Total 100
CDC 5201	Cloud Networks	3	-	-	3	3	50	50	100
CDC 5203	Data Streaming and Visualization	3	-	-	3	3	50	50	100
CDC 5204	JAVA Web Technology and Database	3	-	-	3	3	50	50	100
CDC 5205	Cloud Security Essentials	3	-	-	3	3	50	50	100
	Elective – II	3	-	-	3	3	50	50	100
CDC 5251	Cloud Networks Lab	-	-	3	1	3	50	50	100
CDC 5253	Data Streaming and Visualization Lab	-	-	3	1	3	50	50	100
CDC 5254	JAVA Web Technology and Database Lab	-	-	3	1	3	50	50	100
CDC 5255	Cloud Security Essentials Lab	-	-	3	1	3	50	50	100
	Elective - II Lab	-	-	3	1	3	50	50	100
MPT 5200	Mini Project - II	-	-	-	4	-	100	-	100
PSD 5200	Professional Skill Development - II	-	-	-	1	-	100	-	100
	TOTAL	15	-	15	25				

ME (Cloud Computing) – III & IV Semesters									
CDC 6098	Project Work	-	-	-	25				

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Total Number of Credits to Award Degree	75

List of Electives (Theory)

Elective – I		Elective – II	
Course Code	**Course Name**	**Course Code**	**Course Name**
BDA 5103	Fundamentals of Machine Learning	BDA 5201	Machine Learning for Big Data
CDC 5131	Client-Side Internet Technology	CDC 5231	Cloud Operations
CDC 5132	Cloud Foundations and Architecting	CDC 5232	Data Warehousing and Data Mining
CDC 5133	Cloud Administration and Solution Architect	CDC 5233	Server-Side Internet Technology
		CDC 5234	Azure DevOps for Cloud
		ENP 5230	Entrepreneurship
		ESD 5232	IT Project Management

List of Electives (Lab)

Elective - I		Elective - II	
Course Code	**Course Name**	**Course Code**	**Course Name**
BDA 5153	Fundamentals of Machine Learning Lab	BDA 5251	Machine Learning for Big Data Lab
CDC 5181	Client-Side Internet Technology Lab	CDC 5281	Cloud Operations Lab
CDC 5182	Cloud Foundations and Architecting Lab	CDC 5282	Data Warehousing and Data Mining Lab
CDC 5183	Cloud Administration and Solution Architect Lab	CDC 5283	Server-Side Internet Technology Lab
		CDC 5284	Azure DevOps For Cloud Lab

	ENP 5280	Entrepreneurship Lab
	ESD 5282	IT Project Management Lab

Program Outcome and Course Outcome Mapping

Sl. No.	Course Code	Course Name	Credits	PO1	PO2	PO3	PO4	PO5
1	CDC 5104	Linux and Data Structures	3	*		*		*
2	CDC 5001	DevOps for Cloud	3	*		*	*	*
3	CDC 5102	Cloud Architecture and Management	3	*		*	*	*
4	CDC 5101	Cloud Application with JAVA and Database with Java	3	*		*	*	
5	CDC 5131	Client-Side Internet Technology	3	*		*	*	*
	BDA 5103	Fundamentals of Machine Learning	3			*	*	*
	CDC 5132	Cloud Foundations and Architecting	3	*		*	*	*
	CDC 5133	Cloud Administration and Solution Architect		*		*	*	*
6	CDC 5154	Linux and Data Structures Lab	1	*		*		*
7	CDC 5051	DevOps for Cloud Lab	1	*		*	*	*
8	CDC 5152	Cloud Architecture and Management Lab	1	*		*	*	*
9	CDC 5151	Cloud Application with JAVA and Database Lab	1	*		*	*	
10	CDC 5181	Client-Side Internet Technology Lab	1	*		*	*	*
	BDA 5153	Fundamentals of Machine Learning Lab	1			*	*	*
	CDC 5182	Cloud Foundations and Architecting Lab	1	*		*	*	*
	CDC 5182	Cloud Administration and Solution Architect Lab	1	*		*	*	*

No.	Code	Title	Credits					
11	MPT 5100	Mini Project - I	4	*	*	*	*	*
12	PSD 5100	Professional Skill Development - I	1	*	*			
13	CDC 5203	Data Streaming and Visualization	3	*		*	*	*
14	CDC 5201	Cloud Networks	3	*		*	*	*
15	CDC 5204	JAVA Web Technology and Database	3	*		*	*	
16	CDC 5205	Cloud Security Essentials	3	*		*	*	*
17	CDC 5233	Server-Side Internet Technology	3	*		*	*	*
	CDC 5232	Data Warehousing and Data Mining	3	*		*	*	
	BDA 5201	Machine Learning for Big Data	3			*	*	*
	ESD 5232	IT Project Management	3	*		*		*
	CDC 5231	Cloud Operations	3	*		*	*	*
	ENP 5230	Entrepreneurship	3			*	*	
	CDC 5234	Azure DevOps For Cloud		*		*	*	*
18	CDC 5253	Data Streaming and Visualization Lab	1	*		*	*	*
19	CDC 5251	Cloud Networks Lab	1	*		*	*	*
20	CDC 5255	Cloud Security Essentials Lab	1	*		*	*	*
21	CDC 5254	JAVA Web Technology and Database Lab	1	*		*	*	
22	CDC 5283	Server-Side Internet Technology Lab	1	*		*	*	*
	CDC 5282	Data Warehousing and Data Mining Lab	1	*		*	*	
	BDA 5251	Machine Learning for Big Data Lab	1			*	*	*
	ESD 5282	IT Project Management Lab	1	*		*		*
	CDC 5281	Cloud Operations Lab	1	*		*	*	*
	ENP 5280	Entrepreneurship Lab	1			*	*	
	CDC 5284	Azure DevOps For Cloud Lab	1	*		*	*	*
23	MPT 5200	Mini Project - II	4	*	*	*	*	*
24	PSD 5200	Professional Skill Development - II	1			*	*	*
25	CDC 6098	Project Work	25	*	*	*	*	*