

LESSON PLAN

NAME OF SUBJECT INCHARGE: MD. RUHUL ISLAM

NAME OF SUBJECT: CLOUD COMPUTING (CS1732)

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

SEMESTER (SECTION): VII (EL)

TOTAL NO. OF UNITS: 02

TOTAL NO. OF TOPICS: 06

HOURS ALLOTTED PER WEEK: 03

MINIMUM HOURS ALLOTTED FOR SEMESTER: 46

CREDITS: 04

SCHEDULE OF CLASSES

Sl . No.	Day	Period/Time
1.		
2.		
3.		
4.		

TOTAL WORKING DAYS:

TOTAL WORKING HOURS:

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PROGRAM OUTCOMES

Engineering Graduates will be able to:

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Note: The number of rows can be added/ deleted as per the requirement.

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PROGRAM SPECIFIC OUTCOMES (PSO)

PSO1	Foundation of Computer Vision System: Ability to understand the principles and working of computer vision systems.
PSO2	Foundations of Augmented Reality development: Ability to understand the structure and development methodologies of Augmented Reality. Demonstrate knowledge of the research literature in Augmented Reality for both compositing and interactive applications.
PSO3	Students will show the understanding of impact of information technology solutions on the society and Will be able to understand the application areas of IOT.
PSO4	Basic understanding of crypto currency, its importance and the use of block chain technology. It is focused on defining the technological backbone of Bit-coin fundamentals and expands the concepts to building the block chain technology
PSO5	Overview of Data Science, Its importance and few of its applications will be highlighted. Some basic statistics for data analysis will be covered.
PSO6	An introduction to machine learning and some examples of machine learning algorithm will be covered. An introduction to artificial intelligence and its importance.

COURSE OUTCOME (CO)

CO1	Demonstrate competence in Modelling and Service Oriented Architecture in Cloud Computing paradigms.
CO2	Demonstrate an ability to formulate a solution plan and methodology for an engineering problem using Cloud Computing.
CO3	Demonstrate an ability to generate a diverse set of alternative design solutions to problems in cloud computing.
CO4	Demonstrate an ability to conduct investigations of technical issues And security issues of Cloud Architectures consistent with their level of knowledge.
CO5	Demonstrate an ability to identify/create modern engineering tools, techniques and resources to solve cloud architecture and storage solution.

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PERFORMANCE INDICATOR(PI)

PI 1.7.1	Apply theory and principles of computer science and engineering to solve an engineering problem.
PI 2.6.1	Reframe the computer-based system into interconnected subsystems
PI 2.6.2	Identify functionalities and computing resources.
PI 3.7.2	Consult with domain experts and stakeholders to select candidate engineering design solution for further development.
PI 4.4.2	Able to choose appropriate procedure/algorithm, dataset and test cases.
PI 5.4.2	Create/adapt/modify/extend tools and techniques to solve engineering problems.

INTERNAL EXAMINATION DETAILS

Quiz I

Quality Indicators (QI)	Performance Indicator (PI)			Course Outcome (CO)		Program Specific Outcome (PSO)		Bloom's Taxonomy Level (BL)				Program Outcome (PO)	
Marks													
Attainment (%)													

Note: The number of columns for quality indicators can be added/deleted as per the requirement of the subject.

Sessional I

QI	PI					CO			PSO			BL				PO	
Marks																	
Attainment (%)																	

Note: The number of columns for quality indicators can be added/deleted as per the requirement of the subject.

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Quiz II

QI	PI			CO		PSO		BL				PO	
Marks													
Attainment (%)													

Note: The number of columns for quality indicators can be added/deleted as per the requirement of the subject.

Sessional II

QI	PI					CO			PSO			BL				PO	
Marks																	
Attainment (%)																	

Note: The number of columns for quality indicators can be added/deleted as per the requirement of the subject.

BL – Bloom’s Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating);

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SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY
ODD SEMESTER, 2020
LESSON PLAN

Subject Code : CS 1732
Subject Name : CLOUD COMPUTING
Teacher in-charge : MD. RUHUL ISLAM

1. Objective:

This course gives an introduction to cloud computing and its techniques - The course will introduce this domain and cover the topics of cloud infrastructures, virtualization, software defined networks and storage, cloud storage, and programming models, ecosystem and case studies.

2. Scope:

This course helps to gain fundamental knowledge in all aspects of engineering and technology and also gain exposure to new-age concepts of cloud computing, information security, and web technology.

3. Text Books:

- a) Michael Miller, “Cloud computing: Web based applications that change the way you work and collaborate online”, Que Publishing
ISBN-13: 978-0-7897-3803-5 [T1]
- b) Haley Beard, “Cloud computing best practices for managing and measuring processes for on demand computing, Applications and data centers in the cloud with SLAs”, Emereo, ISBN-10: 1742441610 [T2]
- c) Rishabh Sharma, “Cloud Computing Fundamentals, Industry Approach and Trends” Wiley, ISBN : 978-81-265-5306-8 [T3]

4. Reference Books:

- a) Bunker and Darren Thomson, “Delivering Utility Computing”, John Wiley & Sons Ltd. ISBN-10: 0470014679 [R1]
- b) George Reese, “Cloud Application Architectures”, O’Reilly, ISBN : 978-0-596-15636-7 [R2]
- c) Lee Gillam, “Cloud Computing: Principles, Systems and Applications”, Springer., ISBN-10: 1447125800, [R3]
- d) Brian J. S. Chee, Curtis Franklin, Jr., “Cloud Computing: Technologies and Strategies of the Ubiquitous Data Center”, CRC Press.
ISBN-10: 1439806128 [R4]

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5. Examination rules:

- (i) Questions to be set having equal weightage/marks covering the entire syllabus: EIGHT (4 questions each from UNIT I and UNIT II)
- (ii) Questions to be answered: FIVE (5) selecting atleast TWO from each unit

6. LECTURE MODULES:

SL. No.	Module	Learning Objectives	(PI)/ (CO)/ (PSO)/ (PO)
1	UNDERSTANDING CLOUD COMPUTING	<ul style="list-style-type: none">• Cloud computing• History of cloud computing.• The Evolution of Cloud Computing.• Cloud architecture	PI 1.7.1 CO- 1,3,4 PSO -4,5,6 PO-1,2,4,5
2	DEVELOPING CLOUD SERVICES	<ul style="list-style-type: none">• Private Cloud Computing Platforms• Discovering cloud deployment services• Different levels of virtualization implementation• Types of virtualization	PI-1.7.1, 2.6.1 CO- 1, 4,5 PSO -4,5,6 PO-1,2,4,5
3	CLOUD UTILITY AND STORAGE	<ul style="list-style-type: none">• Software utility application architecture• Software as a service.• Discovering cloud services.• Development services and tools.• Building Cloud Network.	PI-3.7.2,4.4.2 CO- 1,3,5 PSO -4,5,6 PO-1,2,4,5
4	PRIVACY AND SECURITY IN CLOUD COMPUTING	<ul style="list-style-type: none">• Privacy and its relation to cloud-based information systems• Cloud security services• Vulnerability assessment tools for cloud computing	PI-2.6.1,2.6.2 CO- 1,2,3 PSO -4,5,6 PO-1,2,4,5

5	CLOUD COMPUTING FOR EVERYONE	<ul style="list-style-type: none"> • Standards and Working Groups. • Standards Bodies and Working Groups. • Business Process Execution Language. • Utility Computing Technology. • Automating the Data Center. 	PI-3.7.2,4.4.2 CO- 1,2,3 PSO -4,5,6 PO-1,2,4,5
6	CLOUD APPLICATION SERVICES	<ul style="list-style-type: none"> • Exploring online scheduling applications • Cloud for satellite image processing • Mobile cloud computing • Cloud in health care system 	PI-5.4.2 CO- 1,2,3,5 PSO -4,5,6 PO-1,2,4,5

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SYLLABUS PLANNING AND COURSE COVERAGE REPORT

Date of Commencement of Semester:

Last date for completing the syllabus:

Total No. of Remedial classes held:

Any extra classes required to complete the syllabus (Yes/ No):

Module/ Chapter No.	Lecture No.	Topics/Experiments/Program Planned	Alloted hrs.	Date / Week No.	Covered (Yes/No)	Reason if not covered	CO Number Covered	Learning Resources used	Signature of Teacher	Signature of CR	Signature of DAC / HOD
1	1	Cloud computing									
	2	History of cloud computing. Cloud architecture.									
	3	Cloud storage, SLA									
1	4	Importance of cloud computing in IT.									
	5	System architecture of SaaS.									
		System architecture of IaaS.									
		System architecture of PaaS.									
	6	Advantages of cloud computing, Disadvantages of cloud computing, Companies in the cloud today.									

Module/ Chapter No.	Lecture No.	Topics/Experiments/Program Planned	Allotted hrs.	Date / Week No.	Covered (Yes/No)	Reason if not covered	CO Number Covered	Learning Resources used	Signature of Teacher	Signature of CR	Signature of DAC / HOD
2	7	Private Cloud Computing Platforms									
	8	Vulnerability assessment tools for cloud computing.									
	9	Eucalyptus									
	10	Open Nebula									
	11	Open Stack.									
2	12	Differences between- (traditional Windows server and Microsoft Azure)									
2 3	13	Discovering cloud deployment services,									
	14	Development services and tools, Amazon Ec2									
	15	Different levels of virtualization implementation,									
	16	Types of virtualization-(I/O, Network, Server, desktop									
	17	Software utility application architecture									
	18	Characteristics of a SaaS, Software utility applications, Cost versus value.									

Module/ Chapter No.	Lecture No.	Topics/Experiments/Program Planned	Alloted hrs.	Date / Week No.	Covered (Yes/No)	Reason if not covered	CO Number Covered	Learning Resources used	Signature of Teacher	Signature of CR	Signature of DAC / HOD
3	19	Types of cloud database, Cloud file systems, Implementing database systems for multitenant architecture									
	20	GFS architecture									
	21	HDFS architecture									
	22	HDFS working									
	23	Understanding MapReduce programming with an example									
	24	Basics of Apache Pig									
4	25	Privacy and its relation to cloud-based information systems									
	26	Security in the cloud, End-user access to the cloud computing									
	27	Cloud security services									
	28	Vulnerability assessment tools for cloud computing									
	29	Centralizing email communications, Collaborating contact lists									
5	30	Cloud computing for the community,									

Module/ Chapter No.	Lecture No.	Topics/Experiments/Program Planned	Alloted hrs.	Date / Week No.	Covered (Yes/No)	Reason if not covered	CO Number Covered	Learning Resources used	Signature of Teacher	Signature of CR	Signature of DAC / HOD
5	31	Collaborating on group projects and events									
	32	Cloud computing for the corporation									
	33	Cloud case study- ERP									
	34	Nutritious Food Inc									
5 6 6	35	Cloud case study									
	36	Cloud case study									
	37	Cloud for satellite image processing									
	38	Mobile cloud computing									
6	39	Cloud in health care system (ECG, Virus detection)									
6	40	Cloud in health care system (Virus detection)									
6	41	AWS, Elastic load balancing									
6	42	Elastic cloud computing									
	43	Revision Class									
	44	Revision Class									
	45	Revision Class									
	46	Revision Class									

REMEDIAL CLASSES

DATE	NO OF STUDENTS ATTENDED	TOPICS COVERED	REMARKS

Detailed discussions (if any):

