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UNIVERSITY OF PETROLEUM & ENERGY STUDIES

School of Computer Science

Dehradun

COURSE PLAN

Programme : B. Tech CSE-CCVT

Course : Introduction to Virtualization and Cloud

Subject Code : CSIB-274

No. of credits : 3

Semester : III

Session : 2018-19

Batch : 2018-2021

Prepared by : Dr. Rajeev Tiwari

Email :rajeev.tiwari@ddn.upes.ac.in

Approved By

HOD	Associate Dean
UPES Campus	Tel : +91-135-2770137
"Energy Acres"	Fax : +91 135- 27760904
P.O. Bidholi, Via Prem Nagar, Dehradun	Website :www.upes.ac.in

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COURSE PLAN

A. PREREQUISITE:

a. Basic Knowledge of Storage and Network
b. Basic Knowledge of Distributed Computing and Virtualizations.

B. PROGRAM OUTCOMES (POs) for CSE-CCVT:

After completion of the program the students will be able to:

PO1: Apply knowledge of mathematics and Sciences in Computer Engineering and Information Technology.

PO2: Understand the impact of Computer Science and Engineering and Information Technology over global economics, environment and social structure to cater the needs of the society.

PO3: Understand the importance of team work with professional and ethical responsibilities.

PO4: Communicate effectively in various forms useful during all professional activities.

PO5: Implement, and evaluate computer-based systems, processes, components, or programs to meet the desired goal of the business/research domains.

PO6: Develop software by analyzing a problem to identify and define its computational requirements.

PO7: Acquire new technologies for individual and professional development.

PO8: Use current techniques, skills, and tools necessary for computing practices and to solve Engineering problems for the furtherance of the various application domains.

PO9: Apply design and development principles in the development of software systems of varying complexity.

PO10: Ability to understand the concepts of cloud computing virtualization and theoretical and practical exposure to learn salable, reliable and robust IT Infrastructure, data storage, backup & recovery and security.

PO11: Ability to understand the enterprise functional requirements and design solutions for the delivery of services through cloud delivery and deployment models.

PO12: Ability to understand Cloud Computing Reference Architecture and to manage the Cloud Computing Business Solution as per the policy and compliances.

C. OBJECTIVES OF COURSE:-

The objectives of this course are to:

1. Students should be able to understand tools and techniques for creating virtual machines and environment.
2. Student should be able to apply both types of Hypervisors type 1 and type2.
3. Students should be able to design a architectural model of cloud and its delivery model.
4. Design workload for server, memory, IO and cloud.

D. COURSE OUTCOMES FOR Introduction to Virtualization and Cloud : At the end of this course student should be able to

CO1 Significance and requirement of Cloud Computing

CO2 Analyze use of Hypervisor and Its Types

CO3 Understand Anatomy and Delivery Model of Cloud

CO4 Cloud Workload Management

Table: Correlation of POs v/s Cos

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1								1	1	2		
CO2										3	2	1
CO3										3	2	1
CO4										3	2	1

1. WEAK 2. MODERATE 3. STRONG

E. COURSE OUTLINE

Unit I: Virtualization
Unit II: Hypervisors
Unit III: Anatomy of Cloud
Unit IV: Cloud Workload

F. PEDAGOGY

1. **Class Test**
2. **Quiz**
3. **Assignments/ Tutorials**
4. **Digital and analog Presentations**
5. **Concept diary (needs to be maintained by students-short and concise notes which include course concepts that he/she has understood.)**

G. COURSE COMPLETION PLAN

Total Class room sessions	36
Total Quizzes	01
Total Test	01
Total Assignment	03

One Session=60 minutes

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H. EVALUATION & GRADING

Students will be evaluated based on the following 3 stages.

5.1 Internal Assessment - 30%
5.2 Mid-term Examination - 20%
5.2 End term Examination - 50%

H1. INTERNAL ASSESSMENT: WEIGHTAGE – 30%

Internal Assessment shall be done based on the following:

Sl.No.	Description	% of Weightage out of 30%
1	Class Tests and Quizzes	50%
2	Assignments (Problems/Presentations)	20%
3	Attendance and conduct in the class and concept diary	30%

H2*. Internal Assessment Record Sheet (including Mid Term Examination marks)* *will be displayed online at the end of semester i.e. last week of regular classroom teaching.*

H3. CLASS TESTS/QUIZZES: Two Class Tests based on descriptive type theoretical & numerical questions and Two Quizzes based on objective type questions will be held; one class test and one quiz at least ten days before the Mid Term Examination and second class test and second quiz at least ten days before the End Term Examination. Those who do not appear in Viva-Voce and quiz examinations shall lose their marks.

The marks obtained by the students will be displayed on LMS/ICOS/BlackBoard a week before the start of Mid Term and End Term Examinations respectively.

H4. ASSIGNMENTS: There will be home assignments based on theory and numerical problems. Those who fail to submit the assignments by the due date shall lose their marks.

H5. GENERAL DISCIPLINE: Based on student's regularity, punctuality, sincerity and behavior in the class.

The marks obtained by the students will be displayed on LMS/ICOS/Blackboard at the end of semester.

H6. MID TERM EXAMINATION: WEIGHTAGE – 20%

Mid Term examination shall be Two Hours duration and shall be a combination of Short and Long theory Questions.

Date of showing Mid Term Examination Answer Sheets: Within a week after completion of mid Sem examination.

H7. END TERM EXAMINATION: WEIGHTAGE – 50%

End Term Examination shall be Three Hours duration and shall be a combination of Short and Long theory/numerical Questions.

H8. GRADING:

The overall marks obtained at the end of the semester comprising all the above three mentioned shall be converted to a grade.

I. DETAILED SESSION PLAN

SESSION	TOPIC	Course Outcomes Addressed/Sub Objectives	Required Learning Resources (including media)	Discussion(s) and Postings on Frontier	Assignment(s)/Quizzes/ Tests
1	TRADITIONAL IT INFRASTRUCTURE		**Text Book** **Hyperlinks can be included** **Any other sources with credits**	**Lecture and**	
2	BENEFITS OF VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
3	TYPES OF VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
4	HISTORY OF VIRTUALISATION		**Text Book**		
5	TYPES OF SERVER VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
6	HYPERVISORS		**Text Book**	**Lecture and**	

				Discussion	
7	ANATOMY OF SERVERVIRTUALISATION		**Text Book**		
8	BENEFITS OF STORAGE VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
9	TYPES OF STORAGE VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
10	VPN				
11	VLAN		**Text Book** **Hyperlinks can be included** **Any other sources with credits**	**Lecture and Discussion**	
12	BENEFITS OF APPLICATION VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
13	HISTORY OF CLOUD		**Resources on blackboard**	**Online via**	

	COMPUTING				
14	IMPORTANCE OF VIRTUALISATION IN CLOUD COMPUTING		**Text Book**	**Lecture and Discussion**	
15	ANATOMY OF CLOUD		**Text Book**	**Lecture and Discussion**	
16	CLOUD DEPLOYEMENT MODELS		**Text Book**	**Lecture and Discussion**	
17	CLOUD DELIVERY MODELS		**Text Book**	**Lecture and Discussion**	
18	STEPPING STONES FOR DEVELOPMENT OF CLOUD		**Text Book**	**Lecture and Discussion**	
19	GRID COMPUTING		**Text Book**	**Lecture and Discussion**	
20	CLOUD COMPUTING		**Text Book**		

21	DECISION FACTORS FOR CLOUD IMPLEMENTATION		**Text Book**	**Lecture and Discussion**	
22	PUBLIC CLOUD				
23	PRIVATE AND HYBRID CLOUD		**Text Book** **Hyperlinks can be included** **Any other sources with credits**		**• 2-3 coding exercises for students to practice the contents of the units.** **• Some numerical exercises based on these concepts supported by lab exercises**
24	IAAS CLOUD DELIVERY		**Text Book**	**Lecture and**	

	MODEL			**Discussion**	
25	PAAS CLOUD DELIVERY MODEL		**Text Book**		
26	SAAS CLOUD DELIVERY MODEL		**Text Book**		
27	CUSTOMER IT LANDSCAPE		**Text Book**		
28	TRIGGERS OF VIRTUALISATION		**Text Book**		
29	PREPARATION FOR VIRTUALISATION		**Text Book**	**Lecture and Discussion**	
30	TRANSITION TOOLS FOR VIRTUALISATION		**Text Book**		
31	COST SAVING				
32	CLOUD WORKLOAD OVERVIEW				

33	WORKLOADS MOST SUITABLE FOR CLOUD		**Text Book**	**Lecture and Discussion**	
34	WORKLOADS NOT SUITABLE FOR CLOUD		**Text Book**	**Lecture and Discussion**	

Text Books:

1. ***Mastering Cloud Computing, by Rajkumar Buyya***

Reference Books:

2. ***Cloud Computing: Fundamentals, Industry Approach and Trends, by Rishab Sharma, Wiley Publication***

GUIDELINES

***Cell Phones and other Electronic Communication Devices*:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.

E-Mail and online learning tool: Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.

Attendance: Students are required to have **minimum attendance of 75%** in each subject. Students with less than said percentage shall **NOT** be allowed to appear in the end semester examination.

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Course outcome assessment: To assess the fulfilment of course outcomes two different approaches have been decided. Degree of fulfillment of course outcomes will be assessed in different ways through direct assessment and indirect assessment. In Direct Assessment, it is measured through quizzes, tests, assignment, Mid-term and/or End-term examinations. It is suggested that each examination is designed in such a way that it can address one or two outcomes (depending upon the course completion). Indirect assessment is done through the student survey which needs to be designed by the faculty (sample format is given below) and it shall be conducted towards the end of course completion. The evaluation of the achievement of the Course Outcomes shall be done by analyzing the inputs received through Direct and Indirect Assessments and then corrective actions suggested for further improvement.

Passing criterion: Student has to secure minimum 40% marks of the "highest marks in the class scored by a student in that subject (in that class/group class)" individually in both the 'End-Semester examination' and 'Total Marks' in order to pass in that paper.

- Passing Criterion for B. Tech: minimum 40% of the highest marks in the class

Sample format for Indirect Assessment of Course outcomes

NAME:
ENROLLMENT NO:
SAP ID:
COURSE:
PROGRAM:

Please rate the following aspects of course outcomes of Introduction to Virtualization and Cloud.

Use the scale 1-4*

Sl. No.		1	2	3	4

1	CO1			√	
2	CO2			√	
3	CO3				√
4	CO4		√		
5					

* 1 Below Average 3 Good

2 Average 4 Very Good