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**UNIVERSITY OF PETROLEUM & ENERGY STUDIES**

**College of Engineering Studies**

**Dehradun**

**COURSE PLAN**

Programme : B. Tech CSE-CCVT

Course : Introduction to IT infrastructure and Landscape

Subject Code : CSIT 1001

No. of credits : 2

Semester : II

Session : 2017-18

Batch : 2017-21

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**Approved By**

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P.O. Bidholi, , Dehradun

**COURSE PLAN**

1. **PREREQUISITE:**
   * Knowledge of computers and software, open source and Open standards
   * Various IT Applications and application areas, policies etc.
   * Understanding of Data Base and storage & its usage.

**B. Program outcomes (POS) for B.Tech CSE with Spl in Cloud Computing & Virtualization Technologies:**

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: 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.

PO3: 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.

PO4: 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.

PO5 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.

PO6: 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.

PO7: 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.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: 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.

PO11: 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.

PO12: 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.

**B2. Program Specific Outcomes (PSOs)**

PSO1: Perform system and application programming using computer system concepts, concepts of Data Structures, algorithm development, problem solving and optimizing techniques

PSO2: Apply software development and project management methodologies using concepts of front-end and back-end development and emerging technologies and platforms.

PSO3: Ability to understand and apply Cloud Computing architecture for scalable, secure and dynamically provisioned business oriented environment with optimized performance tuning and data reliability.

* OBJECTIVES OF COURSE:

The Course conversance the students with fundamentals of Data Base, and storage like types of storage systems, SAN ( Storage Area Networks) and Zoning, Storage Virtualization, server development, Directory Services.

1. **C COURSE OUTCOMES FOR INTRODUCTION TO VIRTUALIZATION AND CLOUD COMPUTING:**

**At the end of this course student should be able to**

CO1: A complete understanding of IT infrastructure management in terms of database systems

CO2: Systems and storage overview

CO3: Usage of directory structures

CO4: Detailed understanding of network and security

CO5: Understanding of application and middleware concepts

**Table: Correlation of POs and PSOs v/s COs**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Engineering Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual or team work | Communication | Project management and finance | Life-long Learning | Perform system and application programming using computer system concepts | Apply software development and project management methodologies | Ability to understand and apply Cloud Computing architecture for scalable, secure and dynamically provisioned business oriented environment with optimized performance tuning and data reliability. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO 4 | PO 5 | PO6 | PO 7 | PO8 | PO9 | PO 10 | PO 11 | PO12 | PSO13 | PSO14 | PSO15 |
| CSIB274 | Introduction to cloud computing and virtualization |  |  | 2 |  | 2 |  | 2 |  |  |  |  |  |  |  | **3** |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Table: Correlation of POs v/s COs (CCVT)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PO/CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO  8 | PO9 | PO  10 | PO  11 | PO  12 | PO  13 | PO  14 | PO  15 |
| CO1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 3 |
| CO2 |  |  | 2 |  |  |  |  |  |  |  |  |  |  |  |  |
| CO3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO4 |  |  |  |  | 2 |  | 2 |  |  |  |  |  |  |  |  |
| CO5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. WEAK 2. MODERATE 3. STRONG
2. **COURSE OUTLINE:**

**Unit- 1:** Introduction to IT Infrastructure

**Unit- 2:** Storage Overview

**Unit-3**: Systems & Directory Services Overview

**Unit- 4:** Network Security and Overview

**Unit- 5:** Application and Middleware Overview

1. **PEDAGOGY :**

* Class Test
* Quiz
* Assignments/ Tutorials

1. **COURSE COMPLETION PLAN:**

|  |  |
| --- | --- |
| **Total Class room sessions** | 24 |
| **Total Quizzes** | 02 |
| **Total Test** | 02 |
| **Total Assignment** | 02 |

One Session =60 minutes

1. **EVALUATION & GRADING:**

Students will be evaluated based on the following 3 stages.

* Internal Assessment - 30%
* Mid-term Examination - 20%
* End term Examination - 50%

**I. INTERNAL ASSESSMENT: WEIGHTAGE – 30%**

Internal Assessment shall be done based on the following:

|  |  |  |
| --- | --- | --- |
| S. No. | Description | % of Weightage out of 30% |
| 1 | Class Tests and Quizzes | 60% |
| 2 | Assignments (Problems/Presentations) | 30% |
| 3 | Attendance and conduct in the class and concept diary | 10% |

**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 One Quiz based on objective type questions will be held; one class test before the Mid Term Examination and second class test and 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 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 first before the Mid Term Examination and second before the End Term Examination. 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 at the end of semester.*

**H6. MID TERM EXAMINATION: WEIGHTAGE – 20%**

Mid Term examination will be in the online mode, assessment of the marks can be shown after the day of the exam.

**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.

1. **DETAILED SESSION PLAN**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SESSION** | **TOPIC** | **Course Outcomes Addressed** | **Required Learning Resources**  **(including media)** | **Discussion(s) and  Postings on Frontier** | **Assignment(s)/Quizzes/ Tests** | |
| **8** | **UNIT-1 Introduction to IT Infrastructure** | CO1  CO2 |  |  |  | |
| **L1** | Understanding Database types, characteristics |  | |
|  | |
| **L2** | Introduction to database management systems, |  | |
| **L3** | Data warehouse and data marts, Data mining |
| **L4** | Introduction to SQL, join operations, ODBC |  |  |  |  | |
| **L5** | What is information Technology (IT),  Open Standards |  |  |  |  | |
| **L6** | Application Software, Transforming Data into Information |  |  |  |  | |
|  | **UNIT 2:**  **STORAGE OVERVIEW** |  |  |  |  | |
| **L7** | Storage Network Technology., Types of Storage systems |
| **L8** | FC-AL, FABRIC. |  |  | |
| **L9** | Storage Area Networks (SAN) |  |  | |  | | --- | |  |   **Assignment-01, Test-01** | |
| **L10** | Zones, Storage Virtualization. |
|  | **UNIT 3:**  **SYSTEMS & DIRECTORY SERVICES OVERVIEW** |  |  |  |  | |
|  |
| **L11** | Server Technology |  |  |  |  | |
| **L12** | Operating System |
| **L13** | Virtualization, Hypervisor |  |  |  | **Quiz-01** | |
| **L14** | Server Deployment, Server Availability Concepts And Techniques | CO4 |  |  | |
| **L15** | Server Workload, Directory Server Concepts |  |  |  |  | |
| **L16** | Overview of LDAP, LDAP Architecture |  |  |  |  | |
| **L17** | LDAP Models ,LDAP Replication Topologies ,LDAP Data Interchange Format (LDIF) |  |  |  |  | |
|  | **UNIT-4:**  **NETWORK & SECURITY OVERVIEW** |  |  |  |  | |
| **L18** | Network Overview- topologies, Switching and routing concepts, Firewalls, VLANs, Cryptography & PKI basics, Identity & Access Managements, Storage Security |  |  |  |  | |
| **L19** | Network Security (Firewalls, IDS/IPS) | |  | | --- | |  |   **Assignment-02, Test-02** | |
| **L20** | Server Security configuration Control & patch management, Firewalls, Virtualization Security. |
|  | **UNIT 5:**  **APPLICATION & MIDDLEWARE OVERVIEW** |  |  |  |  | |
| **L21** | Introduction to common messaging Systems (MQSeries), | CO9 |  |  | **Quiz-01** | |
| **L22** | Web tired development |
| **L23** | Application servers & clustered |
| **L24** | Discussion |  |  |  |  |
|  | | |

**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.

**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 30%/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 IT Applications & Open Standards.

Use the scale 1-4\*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl. No. |  | 1 | 2 | 3 | 4 |
| 1 | A complete understanding of IT infrastructure management in terms of database systems. |  |  |  |  |
| 2 | Systems and storage overview. |  |  |  |  |
| 3 | Usage of directory structures. |  |  |  |  |
| 4 | Detailed understanding of network and security |  |  |  |  |
| 5 | Understanding of application and middleware concepts. |  |  |  |  |
|  | | | | | |

3

Below Average

Good

1

**\***