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**Format No. QSP/7.1/01.F01 (B) Issue No. 05, Rev. No. 5, Dated: Jan 1, 2017**

**UNIVERSITY OF PETROLEUM & ENERGY STUDIES**

**School of Computer Science**

**Dehradun**

**COURSE PLAN**

Programme : B. Tech. CSE spl. DevOps

Course :Build and Release Management

Subject Code : CSDV 2002

No. of credits : 2

Semester : IV

Session : Jan 2020 – May 2020

Batch : 2018 - 2022

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**Approved By**

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**COURSE PLAN**

1. **PRE-REQUISITES**

Elementary knowledge of SDLC, Development and Deployment.

1. **PROGRAM OUTCOMES (POs) and PROGRAM SPECIFIC OUTCOMES for B.Tech. CSE spl. in DevOps**

**B1. PROGRAM OUTCOMES (POs)**

1. *Engineering knowledge:* Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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.
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.
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.
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.
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.
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.
8. *Ethics:* Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. *Individual and team-work:* Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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.
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.
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.

**B2. PROGRAM SPECIFIC OUTCOMES (PSOs)**

1. Perform system and application programming using computer system concepts, concepts of Data Structures, algorithm development, problem solving and optimizing techniques.
2. Apply software development and project management methodologies using concepts of front-end and back-end development and emerging technologies and platforms.
3. Apply the understanding of DevOps as cultural philosophies, practices, and tools that increase the ability to deliver applications and services at high velocity.

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1. **COURSE OBJECTIVES**
2. To enable the learner to understand the fundamentals of build and release management.
3. To enable students, the usage of build and release management tools.
4. **COURSE OUTCOMES (COs), Mapping with POs and PSOs**

Upon completion of this course the learners will be able to:

CO.1. Explain build and release management cycle in Devops

CO.2. Make use of Build Tool like Maven, Ant, Gradle for dependency management.

CO.3. Developing Unit Test Cases and Generating Code Coverage Reports

CO.4. Understand process and features of release cycle.

**Table: Correlation of the Course with the POs and PSOs**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PO/CO | PO  1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO  9 | PO  10 | PO  11 | PO  12 | PSO  1 | PSO  2 | PSO  3 |
| CO1 | 2 | 2 | 2 |  | 3 |  |  |  |  | 2 | 2 | 2 | 2 | 2 | 3 |
| CO2 | 2 |  |  |  | 3 |  |  |  |  |  | 2 |  | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 |  | 3 |  |  |  |  |  | 2 |  | 2 | 2 | 3 |
| CO4 | 2 | 2 |  |  | 3 |  |  |  |  | 2 | 2 | 2 | 2 | 2 | 3 |

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

1. **COURSE OUTLINE**

|  |  |
| --- | --- |
| **Module** | **Contents** |
| 1 | Introduction To Build And Release Management |
| 2 | Dependency Management |
| 3 | Documentation And Reporting |
| 4 | Understanding A Release Cycle |

1. **PEDAGOGY**

* Presentations
* Flipped Classroom sessions
* Think-Pair-Share Activities
* Video Lectures

1. **COURSE COMPLETION PLAN**

|  |  |
| --- | --- |
| **Total Sessions** | 24 (F2F) |
| **Total Continuity Assessments** | 2 |
| **Total Tests** | 2 |

One Session = 60 minutes

1. **EVALUATION & GRADING**

The components of the instructor-led continuous evaluation system will be as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Assessment** | **Weightage** | **Schedule** |
| 1 | Internal Assessment (IA) | 30% | Detailed Below |
| 2 | Mid-semester Examination (MS) | 20% | Academic Calendar |
| 3 | End-semester Examination (ES) | 50% | Academic Calendar |
| Total | | 100% |  |

Each Assessment is carried out for suitable marks and finally reduced suitably based on its weightage. It is mandatory for all the students to undergo the process of continuous evaluation. The overall marks obtained at the end of the semester comprising the above three shall be converted to a grade.

1. **Internal Assessment:**

Internal Assessment shall be done based on the following detailed breakup and scheme of assessment:

|  |  |  |
| --- | --- | --- |
| **Assessment** | **Points** | **Percentage** |
| Continuity Assessment (CA) | 2 offline CA’s after/nearing completion of every Module @10 points each | 30% |
| Assignments **or** Project | 1 project @20 points **(OR)**  2 Assignments @10 points each | 20% |
| Test | 2 Tests after/towards the end of Module 2 & 5 @10 points each | 40% |
| Conduct of the student | Participation in Online and F2F lessons @10 points | 10% |
| **Total** | **100 points** | **100%** |

The marks awarded for the Online Internal Assessments will be available in Black Board and displayed to the students.

1. **Mid-semester Examination:**

Mid-semester examination will cover approximately half of the entire course content and shall be of two hours duration. The question paper pattern would be discussed well in advance before the exam. The evaluated answer sheets of the written exam shall be disclosed to the students ten days after the examinations.

1. **End-semester Examination:**

End-semester examination will cover the entire course content and shall be of three hours duration. The examination shall have short answer type questions, analytical and conceptual comprehension through essay/descriptive type questions, and cases or problem solving exercises. The evaluated answer sheets shall be disclosed to the students ten days after the examinations.

**GRADING:**

At course completion, the student is awarded with a grade (on a 10-point scale) based on the composite score (30% IA + 20% MS + 50% ES) obtained out of 100 marks. Students scoring less than 35 absolute marks in individual course either in End semester examination or as composite score shall be awarded a ‘F’ grade. Students scoring 85 marks and above as composite score shall be awarded a ‘O’ grade. The minimum individual course grade is ‘C’.

Students not meeting the individual course criteria or SGPA criteria (NC) should register for the Supplementary Examination (SE) by paying the prescribed fee per subject as notified by the University. For improving the grades (in case of NC) the student needs to opt for such courses in which the grade is less than ‘A’.

The student who is debarred due to shortage of attendance or with Grade ‘F’ for a course will need to register for Summer School during summer vacation (June-July) by paying the prescribed fee per subject as notified by the University and repeat continuous internal evaluation (IA) of the respective subject(s). The grade is awarded based on the composite score (30% IA + 70% SE) and capping (grade ‘A’, 8.0 in a 10-point scale). All other rules and regulations such as requirement of passing, etc. will remain same as mentioned above.

1. **DETAILED SESSION PLAN**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Module /Session** | **Big Ideas/ Topics** | **Course Outcomes Addressed** | **Required Learning Resources (including media)** | **Pedagogy/ Discussion(s)/ Postings** | **Assessment** |
| **1** | Introduction of Build and Build Management | CO1 | Facilitator Guide |  |  |
| **2** | Introduction of Release and Release Management | CO1 | Facilitator Guide |  |  |
| **3** | Build Abstraction | CO1 | Facilitator Guide |  |  |
| **4** | Declarative Dependency Management | CO2 | Facilitator Guide | Online Tutorial Site |  |
| **5** | Using Repositories | CO2 | Facilitator Guide |  |  |
| **6** | Dependency Identification | CO2 | Facilitator Guide |  |  |
| **7** | Transitive Dependencies | CO2 | Facilitator Guide |  |  |
| **8** | Dependency Scope | CO2 | Facilitator Guide |  |  |
| **9** | Examples of tools (Maven, Ant and Gradle) | CO2 | Facilitator Guide | Online Tutorial Site |  |
| **10** | TEST 1 |  |  |  | TEST 1 |
| **11** | Doubt Session 1 |  |  |  |  |
| **12** | Using the Site Life Cycle | CO4 | Facilitator Guide | Online Tutorial Site |  |
| **13** | Advanced Site Configuration | CO3 | Facilitator Guide |  |  |
| **14** | Generating Unit Test Reports | CO3 | Facilitator Guide |  |  |
| **15** | Generating Code Coverage Reports | CO3 | Facilitator Guide |  |  |
| **16** | Project Release | CO3 | Facilitator Guide |  |  |
| **17** | Checking in Source Code | CO3 | Facilitator Guide | Online Tutorial Site |  |
| **18** | Prepare Goal | CO4 | Facilitator Guide | Online Tutorial Site |  |
| **19** | Clean Goal | CO4 | Facilitator Guide | Online Tutorial Site |  |
| **20** | Perform Goal | CO4 | Facilitator Guide | Online Tutorial Site |  |
| **21** | Complete Project Demonstration using Maven | CO3, CO4 |  |  |  |
| **22** | TEST 2 |  |  |  | TEST 2 |
| **23** | Doubt Session 2 |  |  |  |  |
| **24** | **Doubt Session 3** |  |  |  |  |

1. **SUGGESTED READING**

**Text Books**

* 1. Build and Release Management – Volume 1, Xebia Press

Reference Books

1. Maven: The Definitive Guide – Sonatype
2. Apache Maven Cookbook - Raghuram Bharathan

Note: Also refer to the Web-links/Resources in Blackboard and NPTEL videos.

1. **GUIDELINES**

**Cell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) must be turned off during the lab session.

**e-Mail and online learning tool:** Each student in the class should have UPES e-mail id and a password to access the Blackboard regularly. The best way to arrange meetings with faculty is by email and prior appointment. 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 the subject.

1. **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 Continuous assessments. Each assessment 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.

**Format for Indirect Assessment of Course Outcomes**

|  |  |
| --- | --- |
| NAME: |  |
| ENROLLMENT NO: |  |
| SAP ID: |  |
| COURSE: | Build and Release Management |
| PROGRAMME: |  |

Please rate the following aspects of the Course Outcomes. Use the scale 1 to 4 \*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No.** | **Course Outcomes** | **1** | **2** | **3** | **4** |
| CO1 | Explain build and release management cycle in DevOps |  |  |  |  |
| CO2 | Make use of Build Tool like Maven, Ant, Gradle for dependency management. |  |  |  |  |
| CO3 | Developing Unit Test Cases and Generating Code Coverage Reports |  |  |  |  |
| CO4 | Understand process and features of release cycle. |  |  |  |  |

Very Good

4

3

Below Average

Average

Good

2

1

\*