**Pokhara University**
**Faculty of Science and Technology**

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| Course Code.: CMP 438 (2 Credits) | Full marks: 100 |
| Course title: Software Project Management **(2-1-0)** | Pass marks: 45 |
| Nature of the course: Theory/Practice/Theory & Practice | Time per period: 1 hour |
| Year, Semester:…… | Total periods: 45 |
| Level: Bachelor | Program: BE |

## 1. Course Description

This course introduces the principles and practices of Software Project Management. It covers essential topics such as project life cycles, planning, estimation, monitoring, and control, with a focus on both traditional and Agile methodologies. The course also delves into the practical aspects of managing software projects, including team leadership, configuration management, and the use of project management tools. Ethical and legal considerations in software project management are also discussed. By the end of the course, students will be equipped with the skills needed to effectively plan, execute, and manage software projects.

## 2. General Objectives

- ✓ To understand the principles, methodologies, and processes involved in software project management.
- ✓ To gain insights into different project management approaches, including traditional and Agile methods.
- ✓ To develop skills for effective project planning, estimation, monitoring, and control.
- ✓ To learn about project management tools and software used for managing software projects.
- ✓ To understand the ethical, legal, and societal implications of software project management.

## 3. Contents in Detail

| Specific Objectives | Contents |
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| ▪ Understand the basic definition and importance of software project management.<br>▪ Differentiate between software project management and general project management.<br>▪ Identify the key roles and responsibilities involved in software project management. | Unit 1: Introduction to Software Project Management (4 Hours)<br>Definition and Importance<br>Difference between Software Project Management and General Project Management<br>Key Roles and Responsibilities |
| ▪ Understand the various phases of project management and their significance.<br>▪ Understand the process groups | Unit 2: Project Life Cycle and Processes (4 Hours)<br>Phases of Project Management: Initiation, Planning, Execution, Monitoring & Control, Closure<br>Process Groups and Knowledge Areas (as per PMBOK) |

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| and knowledge areas as outlined in PMBOK.<br>▪ Understand main modern principles of software mangement | Top 10 Software management Principles |
| ▪ Develop skills in managing project scope, time, and cost effectively.<br>▪ Understand the creation and importance of a Work Breakdown Structure (WBS).<br>▪ Learn to manage project risks, quality, and communication.<br>▪ Numerical to understand about CPM and PERT analysis | Unit 3: Project Planning (6 Hours)<br>Project Scope Management<br>Work Breakdown Structure (WBS)<br>Time Management: Scheduling, Gantt Charts, Network Diagrams, CPM and PERT Numerical<br>Cost Management: Budgeting, Estimation Techniques<br>Risk Management: Identification, Analysis, Mitigation Strategies<br>Communication Management: Stakeholder Engagement, Information Distribution<br>Working environment (Onsite/Offsite/Work from home) |
| ▪ Understand the principles of Project Organization | Unit 4: Project Organization and Responsibilities (3 Hours)<br>Project Organization and Responisbilities<br>Line of Business Organization |
| ▪ Learn about different automation techniques used in software project management.<br>▪ Understand different metrics indicators used in Project Management.<br>▪ Understand different building blocks for automation and different Project Environment. | Unit 5: Process Control and Automation (5 Hours)<br>Seven Core metrics, Life cycle Expectations,Process Discriminants, Metrics Automation<br>Automation Building Blocks, Project Environment |
| ▪ Understand performance measurement techniques like Earned Value Management (EVM).<br>▪ Learn about monitoring techniques and tools used for tracking project progress.<br>▪ Understand the importance of change control and issue tracking. | Unit 6: Project Monitoring and Control (4 Hours)<br>Performance Measurement: Earned Value Management (EVM)<br>Monitoring Techniques and Tools<br>Change Control Management<br>Issue and Risk Tracking |
| ▪ Learn about version control systems and their importance in software projects.<br>▪ Understand the basics of configuration management and release management.<br>▪ Explore project management tools and legal/ethical issues related to project management. | Unit 7: Software Configuration Management and Tools (4 Hours)<br>Version Control Systems: Git, SVN, etc.<br>Configuration Management Plans<br>Change Management and Release Management<br>Overview of Project Management Tools: MS Project, JIRA, Trello, etc.<br>Legal and Ethical Issues in Software Project Management |
| ▪ Analyze real-world software projects to understand the application of project | Unit 8: Case Studies and Real-World Scenarios (2 Hours)<br>Analysis of Successful and Failed Software Projects |

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| management principles.<br>▪ Learn lessons from successful and failed projects.<br>▪ Understand project closure activities and evaluation methods. | Lessons Learned and Best Practices<br>Project Closure and Evaluation: Handover, Documentation, Post-Implementation Review<br>Aspects and issues related to Work from home |

## 4. Methods of Instruction.

- Lectures: Core concepts and theoretical foundations will be covered in lectures.
- Case Studies: Real-world examples will be analyzed to link theory with practice.
- Group Discussions: Active participation in discussions to develop critical thinking.
- Practical Sessions: Hands-on experience with project management tools and techniques.

## 5. List of Tutorials

The following tutorial activities of 15 hours per group of maximum 24 students should be conducted to cover all the required contents of this course.

| S.N. | Tutorials |
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| 1 | Students work in groups to define the scope for a mock software project, including project goals, deliverables, and constraints. |
| 2 | Students develop a detailed WBS for a small software project, breaking down tasks and deliverables. |
| 3 | Use project management software (MS Project or Trello) to create a project schedule and Gantt chart for the WBS created in the previous practical. |
| 4 | Students identify potential risks in a given project scenario and assess the impact and probability, creating a risk register. |
| 5 | Conduct a Scrum sprint planning session where students take on roles (Product Owner, Scrum Master, Development Team) and develop user stories, tasks, and sprint backlog. |
| 6 | Activity: Students participate in a planning poker session to estimate story points for various user stories in an Agile project. |
| 7 | Given project data (planned value, actual cost, and earned value), students calculate key EVM metrics like cost and schedule variance, cost performance index (CPI), and schedule performance index (SPI). |
| 9 | Students collaborate on a software project using Git to manage source code changes. They practice branching, merging, and managing conflicts. |
| 10 | Simulate a project where students propose changes to a project plan and go through a formal change control process, documenting the changes and analyzing impacts. |
| 11 | Students conduct a project closure session, documenting the handover, creating a post-implementation review report, and discussing lessons learned. |

## 6. Practical Works (Any Eight)

| S.N. | Practical works |
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7. **Evaluation system and Students' Responsibilities**

**Evaluation System**

In addition to the formal exam(s) conducted by the Office of the Controller of Examination of Pokhara University, the internal evaluation of a student may consist of class attendance, class participation, quizzes, assignments, presentations, written exams, etc. The tabular presentation of the evaluation system is as follows.

| External Evaluation | Marks | Internal Evaluation | Marks |
|---|---|---|---|
| Semester-End Examination | 50 | Class attendance and participation | 5 |
| | | Field visit and field report | 5+5 |
| | | Quizzes/assignments and presentations | 10 |
| | | Internal Term Exam | 25 |
| Total External | 50 | Total Internal | 50 |
| Full Marks 50+50 = 100 | | | |

**Students' Responsibilities**:

Each student must secure at least 45% marks in the internal evaluation with 80% attendance in the class to appear in the Semester End Examination. Failing to obtain such score will be given NOT QUALIFIED (NQ) and the student will not be eligible to appear in the End-Term examinations. Students are advised to attend all the classes and complete all the assignments within the specified time period. If a student does not attend the class(es), it is his/her sole responsibility to cover the topic(s) taught during the period. If a student fails to attend a formal exam, quiz, test, etc. there won't be any provision for a re-exam.

8. **Prescribed Books and References**

**Text Book**


- Hughes, B., Cotterell, M., & Mall, R. (2018). Software project management (6th ed.). McGraw Hill Education (India) Private Limited.


**Reference Books**

- "Agile Project Management: Creating Innovative Products" by Jim Highsmith, 2nd Edition. ISBN: 978-0321658395. Amazon | Pearson.
- "Project Management: A Systems Approach to Planning, Scheduling, and Controlling" by Harold Kerzner, 12th Edition. ISBN: 978-1118022276. Amazon | Wiley.
- "Configuring Project Management and Visual Studio Team Services" by Gianluca Benvenuti. ISBN: 978-1788834531. Amazon | Packt.
- "Information Technology Project Management" by Kathy Schwalbe, 8th Edition. ISBN: 978-1285452340. Amazon | Cengage.
- "Introduction to Software Project Management" by Adolfo Villafiorita. ISBN: 978-0367179823. Amazon | CRC Press..