1. **Course number and name:** CMSE 473 Software Process & Management
2. **Credits and contact hours, and categorization:** Credits: 4, Contact hours: 6, Engineering Sciences and Design
3. **Course Instructor:** Prof. Dr. Duygu Çelik Ertuğrul
4. **Textbook:**

* *Project Management: Process, Technology and Practice, Ganesh Vaidyanathan, Indiana University, South Bend, ISBN-10: 0132807181 • ISBN-13: 9780132807180 ©2013*

**Other supplemental materials:**

* *Information Technology Project Management, Kathy Schwalbe, 7th Edition, ISBN-13: 978-1285847092.*
* *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Fifth Edition, Project Management Institute, 2013, ISBN13:9781935589679.*
* *Software Engineering 10th ed., Ian Sommerville, April 2015.*
* *Project Management Processes- Project Skills, Paul Newton, http://www.free-management-ebooks.com/dldebk-pdf/fme-project-processes.pdf*

1. **Specific course information**
2. **Catalog description:** In this course, software project processes and project management methodologies considering both practical and theoretical aspects in the context of software systems development will be studied in detail. Basic principles and methods for initiation, planning and execution of software projects by considering software process management issues are discussed. The students will be supported with sufficient knowledge based on software engineering project management practices by taking this course that provide successfully initialize a project, reduce the development risks and finalize a software project successfully.
3. **Prerequisite:** CMSE 321 and MATH 322
4. **Required/elective/selected elective:** Required
5. **Specific goals for the course**
6. **Course outcomes:** On successful completion of the course, all students will be able to:
7. understand the four distinct phases of project management life cycle; Planning, Execution, Monitoring and Closing Phases.
8. execute a software project and manage the project work, scope, schedules, and cost.
9. understand project management processes and PMBOK components.
10. understand the extensive coverage of oral and written communication skills, including systems documentation, project management, team management, and a variety of systems development and acquisition strategies.
11. plan, analyze, design, develop and test an end-to-end medium-to-reasonable large-scale software system.
12. apply project cost management activities and calculate budget and prepare a cost estimate for the software project.
13. apply project size estimation (FP), effort estimation (COCOMO models), schedule estimation (GANTT charts, CPM, PERT), shortening (Crashing) techniques on the software project.
14. comprehend the concept of team structure and project communication management.
15. acquire knowledge about quality assurance, quality control, and risk management.
16. describe various project management activities such as tracking, project procurement, configuration management, monitoring.
17. write concrete and clear technical reports in planning and management, requirement specifications, and other reports for the project stakeholders.
18. use various software project management tools throughout the project life cycle.
19. convey technical material through oral presentation and interaction with an audience.
20. **Student outcomes listed in Criterion 3**
21. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
22. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
23. an ability to communicate effectively with a range of audiences
24. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
25. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
26. an ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions
27. **Topics covered**

* **Project Management Summary**: Projects and Project management, Classification of Projects, Software Development Life Cycle (SDLC), Failure Factors, etc.
* **SDLC**: iterative approach, spiral model, rational unified process, scrum model, and the extreme programming model.
* **Process and Methods**: Continuous Improvement Method (CIM), Six Sigma process, Capability Maturity Model (CMM) process.
* **Cost Estimation Tools**-COCOMO
* **Project Scheduling and Time Management**: Network Planning Techniques, Arrow Diagramming Method (ADM), Critical Path Method (CPM), PERT Analysis, Probability-based Path Analysis, Crashing
* **Project Initiation Methods**: Project selection priorities, the project charter, how to select a project manager and project team, how to identify stakeholders and conduct stakeholder analysis, requirements for a project, and project scope as well as how companies align their project strategy with their corporate strategy with examples.
* **Planning & Management**: Project plans and documents, Scope document, Work breakdown structures, Gantt Chart, Responsibility Matrix, Contract terminology, A procurement management plan, A make-lease-or-buy decision, Procurement documentation, Selection criteria, and Change requests.
* **Risk Management**: Risk identification, planning, monitoring, and control and includes techniques such as Project Failure Mode and Effects Analysis (PFMEA) and decision trees.
* **Project Management Tools**: Process map, brainstorming, quality functional deployment, the Kano model, affinity diagrams, fishbone diagrams, check sheets, Pareto charts, Nominal Grouping Technique, Delphi technique, SWOT analysis, and burndown charts.
* **Project Quality Management** and Performance, Resourcing, Costing, and Control, Project Closure, Project Organizational Structures and Project Success.