

EE P 598 Syllabus, Summer 2020

Course Number and Title: EE P 598 - Engineering Project Management and Reporting

Instructor: Alexander Mamishev

Credits: 4

Course Overview and Curriculum Content:

The purpose of this course is to refine the project management and collaborative skills of electrical engineering graduate students and industry professionals. The course teaches students how to lead and manage a team to meet tight deadlines, effectively collaborate with senior and junior project staff, and to optimize the team effort to meet project milestones. The course has extensive hands-on exercises with modern software tools and in-class discussions about project failures and successes, partly based on student experience at their workplaces. Understanding how to lead a quality team builds an excellent foundation for career advancement.

The following four principle areas of effective project collaboration will be covered throughout the course: (1) communication, (2) organization, (3) software, and (4) process review. This course will give students the tools to appropriately lead and manage a small project team, with an emphasis on product quality and time efficiency to meet relevant project deadlines and milestones. The skills and concepts covered in this course apply to all forms of project management, although emphasis will be placed on electrical engineering efforts.

Learning Goals and Objectives:

Upon completion of the course, students will be able to:

- Lead teams and assign tasks to meet project deadlines.
- Capitalize on advantages and offset the drawbacks of remote work
- Communicate with external personnel to obtain important project materials.
- Prepare and publish technical documents in a collaborative, deadline-focused environment, where the real-time editing features of software like Office 365 are required.
- Use communication software like Slack to follow up on a team's status, thus avoiding less efficient tools like email or phone.
- Use Kanban Boards and other organizational spreadsheets to quantify projects and to see the big picture, as well as to assign individualized, time-sensitive tasks to team members.
- Conduct an internal feedback review after project completion to identify weaknesses of the team and strategies to solve or adapt to these weaknesses.
- Get the most out of new project staff via effective training strategies.

Evaluation and Grading:

Grades will be based on homework assignments, quizzes, a midterm, and a group paper. A breakdown of the grade distribution appears below:

Class Participation:	10%
Homework:	25%
Quizzes:	10%
Midterm:	30%
Final Group Project:	25%

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Authors of selected reports will be given an opportunity to present their report in front of the class. Class time will be taken to critique and analyze the subject of the paper and the presentation itself. Extra credit will be assigned based on the presentations and class participation.

Grading is on the curve. There will be no Final Exam.

Lecture Logistics:

Lecture attendance is not required; however, your class participation element of the grade is likely to benefit if you attend frequently. Laptops will be necessary for most lectures. The sequence of material will strongly depend on the results of assessments, homework, and student feedback.

Approximate Weekly Course Schedule:

Week 1: Introductions

- Course introduction, class expectations, and syllabus overview.

Week 2: Navigating Effective Organizational/Team Hierarchy Structures

- The roles and expectations of junior staff, senior staff, and project managers for an effective cross-discipline collaborative effort.
- Avoiding wasteful team meetings; introduction to common collaborative pitfalls.
- Effective strategies for assigning tasks, leading teams, requesting assistance from superiors, getting tasks accomplished on time and strategies for project sequencing/planning.

Week 3: Effective Team Communication

- Approaching external collaborators, as well as senior and junior staff. The Do's and Don'ts for requesting materials, support letters, and recommendation letters.
- Using dedicated collaborative software for real-time messaging for global team communications.
- Using the right software: Phone vs. Email vs. Skype vs. Slack.
- Software needs: team communication channels, private messaging, chat history.

Week 4: Effective Project Management Software Usage

- Maintaining a broad overview of a project's tasks and needs to meet important milestones and deadlines.
- Using the right software: Kanban Boards via Google Spreadsheets vs. Pivotal Tracker vs. Trello, etc.
- Software needs: task status, task codename, priority, assigned from/to, due dates, task description, status/obstacles to completion.

Week 5: Utilizing Cloud-Based Repositories for File Sharing, Organization, and Storage

- Software needs: expedient file transfer, cloud-based for accessibility, leapfrog prevention.
- Using the right software: Dropbox vs. Google Drive vs. Microsoft OneDrive.

Week 6: Optimizing and Automating Business Processes

- Time should be spent on meaningful effort, thinking about the project, or meeting a milestone. Miscellaneous time wasters on tasks that can be automated is not an effective use of time.
- Figures, tables, circuit diagrams, engineering schematics, equations.
- Case example: writing a large report in Microsoft Word should not be done manually, but should instead be automated via cross-referencing and template reuse.

Week 7: Real-time collaboration and simultaneous Effort / Avoiding Leapfrogging

- Avoiding conflicts when assigning similar tasks to different team members in parallel.
- Case example: writing a large report in Microsoft Word can be written via Office 365, allowing for simultaneous document editing.
- Writing code and storing relevant project materials in accessible ways that other project members can quickly pick up and utilize.
- Case example: using EndNote to store relevant publications to a project.

Week 8: Post-Project Review

- Holding a process review session after project completion. Requesting feedback from all project participants. Learning from mistakes and identifying current weaknesses.
- Documenting project efforts and effective project archival for data reuse.

Week 9: Training Junior Members and New Staff

- How to get the most out of your new project staff; getting them up to speed so they can begin helping the effort.
- Navigating environments where there are high staff turnaround and frequently green team members.
- How to avoid the time-wasting pitfall of teaching each new team member the same content.
- Larger training programs, step-by-step instructions, instructional videos, informative documents, and other materials to be explored by all new recruits before starting.

Week 10: Class Wrap-up and Feedback

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- Topics will be specific and relevant to each class on a case-by-case basis. Addressing strengths and weaknesses of student's work. Solving specific collaborative challenges that students have faced in their academic careers.