

ENGR 50300: Leading High-Performing Engineering & Technology Teams

Course Syllabus

COURSE INFORMATION

Course Number, Title, CRN, & Credit Hours: ENGR 50#00 Leading High-Performing Engineering & Technology Teams (XXXX) (3 credit hours)

Meeting Days, Times, & Location: TBD

Instructional Modality
TBD

INSTRUCTOR CONTACT INFORMATION

TBD

Office Hours:

TBD

COURSE DESCRIPTION

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Engineering and technology work is increasingly performed through teams operating in complex, fast-moving environments. *Leading High-Performing Engineering and Technology Teams* is a graduate-level course designed to equip students with the knowledge and skills required to understand, diagnose, and improve team performance in technical settings. The course focuses on how patterns of interaction within teams shape outcomes such as execution, adaptability, and innovation.

The course examines team performance through behavioral, biological, and structural lenses. Students will explore contemporary research on team effectiveness alongside applied frameworks, including the Team Biodynamics model, to understand how interaction patterns influence coordination, decision-making, and resilience. Through a combination of theoretical frameworks, case studies, and applied exercises, students will learn how to diagnose team dynamics, design conditions for effective teamwork, and guide teams operating in complex and interdependent environments.

The course equips engineering and technology professionals with practical tools to lead high-performing teams, strengthen collaboration, and enhance the ability of teams to execute under pressure and adapt over time.

LEARNING RESOURCES, TECHNOLOGY, & TEXTS

Required Materials

- Hutcheson, S. (anticipated 2026). *Biohacking teams: Leveraging the biology of behavior to maximize team performance*. Wiley.*
- Edmondson, A. C. (2019). *The fearless organization: Creating psychological safety in the workplace for learning, innovation, and growth*. Wiley.
- Wageman, R., Gardner, H., & Mortensen, M. (2012). *Senior leadership teams: What it takes to make them great*. Harvard Business Review Press.

* pre-publication manuscript will be made available to students

Additional Readings

Additional course resources like case studies and journal articles may also be assigned.

Technology

You will need access to a word processor (i.e. MS Word) and presentation program (i.e., PowerPoint), remember that [MS Office is free for all students](#). Most of the class periods will be spent together in the assigned classroom. In some instances, however, classwork may be done virtually, using Boilercast, Brightspace, MS Teams, Zoom, and other available tools. In these instances, some of our class work will be asynchronous, meaning that students will not need to be present online at a specific time. Rather, the work can be done at any time prior to the due date for that work. For this asynchronous work, students are expected to read/view the assigned course content and participate in the course assignments. Your instructor will let you know ahead of time if any class periods will be done this way.

Tutoring Support

The [Academic Success Center](#), located in Wiley Hall, Room C215, provides a variety of proactive, practical and approachable academic support services for undergraduate students. Visit [Ask a Librarian](#) to connect with helpful resources and services provided by the Purdue Libraries and School of Information Studies for course assignments and projects.

Brightspace Learning Management System (LMS)

Access the course via Purdue's Brightspace learning management system. Begin with the Start Here tab, which offers further insight to the course and how you can be successful in

it. It is strongly suggested that you explore and become familiar not only with the site navigation, but also with content and resources available for this course. See the Student Services widget on the campus homepage for resources such as Technology Help, Academic Help, Campus Resources, and Protect Purdue.

LEARNING OUTCOMES

By the end of the course students will be able to...

- Analyze team dynamics and performance using contemporary frameworks and behavioral models, including Team Biodynamics.
- Design conditions that improve team performance, including communication structures, feedback loops, and coordination mechanisms.
- Lead and optimize team performance in engineering and technology settings by improving collaboration, managing conflict, and aligning team behavior with goals.

SCHEDULE & TOPICS

The following is organized for 16-week in-class delivery. Adjustments will be made for other schedules.

Module One: Foundations of Team Performance

- **Week 1: Course Overview and the Nature of High-Performing Teams.** Introduction to teams as the unit of performance. Why teams fail despite strong individuals. Overview of course project.
- **Week 2: Models of Team Effectiveness.** Input-process-output models and contemporary extensions. Limits of traditional models.
- **Week 3: Behavioral Foundations of Team Performance.** How individual behavior scales into interaction patterns. Introduction to Team Biodynamics.
- **Week 4: Communication, Coordination, and Shared Understanding.** Information flow, alignment, and breakdowns in technical teams.
- **Week 5: Diagnosing Team Dynamics.** Identifying patterns of interaction, bottlenecks, and misalignment.

Module Two: Designing for Team Performance

- **Week 6: Roles, Structure, and Task Design.** Clarity, interdependence, and workload distribution.
- **Week 7: Feedback Loops and Team Learning.** How teams adapt and improve over time. Reflection and iteration.

- **Week 8: Psychological Safety and Risk-Taking.** Insights from *The Fearless Organization*. Speaking up, error reporting, and learning.
- **Week 9: Conflict, Decision-Making, and Alignment.** Constructive conflict vs. dysfunction. Decision processes in technical teams.
- **Week 10: Distributed and Cross-Functional Teams.** Challenges of coordination across distance, disciplines, and boundaries.

Module Three: Leading and Sustaining Team Performance

Week 11: Performance Under Pressure. Time constraints, uncertainty, and high-stakes environments.

- **Week 12: Leading Teams Without Authority.** Influence, credibility, and coordination in matrixed environments.
- **Week 13: Case Study: High-Performing Technical Teams.** Analysis of real-world examples across engineering and technology contexts.
- **Week 14: Scaling Team Performance Across Organizations.** From single teams to teams of teams. Coordination at scale.
- **Week 15: Measuring Team Performance and Outcomes.** Defining and assessing team effectiveness. Linking behavior to results.
- **Week 16: Final Presentations and Integration.** Presentation of team performance projects. Integration with leadership and systems.

ASSIGNMENTS & ASSESSMENTS

The following is an overview of the assignments and assessments.

Team Dynamics Diagnosis Assignments. Students will complete individual assignments diagnosing team dynamics in engineering or technology contexts. These assignments focus on identifying communication patterns, coordination challenges, and performance constraints.

Team Performance Design Project. Students will develop a comprehensive plan to improve the performance of a real or simulated team. The project includes diagnosing current dynamics and designing targeted interventions.

Case Discussions and Applied Exercises. Students will engage in discussions and exercises based on real-world cases related to teamwork, collaboration, and performance in technical environments.

Final Presentation. Students will present their team performance project, demonstrating their ability to analyze and improve team effectiveness.

GRADING: SCALE & WEIGHTING

The grading scale is as follows:

A: 90–100
B: 80–89
C: 70–79
D: 60–69
F: Below 60

Grades will be weighted as follows:

Discussion Assignments: 36 points (3x 12)

Team Dynamics Diagnosis Assignments: 36 points (3x12)

Team Performance Design Project: 72 points

- Milestone 1: 8 points
- Milestone 2: 16 points
- Milestone 3: 16 points
- Final Report: 20 points
- Presentation: 12 points

Total Points: 144

CLASS ATTENDANCE

This is a highly-participatory course and classroom attendance will be key to your success in it. Full attendance is expected and will be accounted for as part of your final grade. Attendance will be taken within the first 15 minutes of each class period. If you miss the taking of attendance you will be considered absent. You are allowed up to two missed class periods without a grading penalty. Use these wisely – interviews, illness, etc.

LATE ASSIGNMENTS

Every assignment will have a due date that is communicated in Brightspace. Late assignments are not accepted.