New Course EFD Template

PURDUE UNIVERSITY | College of Engineering

Engineering Faculty
Document No.: 91-26
September 4, 2025

**TO**: The Engineering Faculty

**FROM**: The Faculty of the Institute for Control, Optimization and Networks (ICON)

**RE**: New graduate course – ENGR 57700. Robotics, Autonomy, IoT Projects

The Faculty of the Institute for Control, Optimization and Networks (ICON) has approved the following new graduate course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

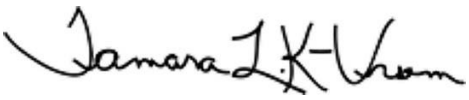
ENGR 57700 Robotics, Autonomy, IoT Projects

3 total credits; Prerequisite: None

This course provides project-based learning experience as a lab for the Professional M.S. Programs in Robotics, Autonomy and Internet-of-Things (IoT). In particular, students spend the semester focusing on a given project proposed by faculty mentors at Purdue University or with a pre-approved industrial mentoring team. The students expected to participate individually or in teams with the project faculty or industry mentors. Upon approval of course instructors, students are also allowed to team up together under supervision of one or more faculty mentors to accomplish the goals of challenging projects such as national or international competition related to Robotics/Autonomy/IoT. The main objective of this course is to provide a means by which the students can improve and demonstrate their capabilities in topics related to robotics/autonomy/IoT. This includes interacting in a professional manner, solving technical problems of significant interest to industry and academia, and communicating technical issues using oral and written techniques. Thus, this course provides a means by which to simulate interactions that are important for engineers as they start their professional careers.

RATIONALE:

This course is part of the professional development component for our professional masters programs in Robotics, Autonomy and Internet-of-Things (IoT). It is part of up to 6 course credits for professional development requirements.



Tamara Kinzer-Ursem, Assoc. Dean of Graduate and Professional Education
Head/Director of Interdisciplinary Engineering

Link to Curriculog entry: [Paste link to Curriculog entry.]

## 1. Course Information

- **Course number.** ENGR 57700
- **Course title.** Robotics, Autonomy, IoT Project Course
- **Course credit hours. 3**
- **Prerequisites.** To be determined by each project

**Instructional Modality.** This course will consist of projects led by faculty mentors in the Institute for Control, Optimization, and Networks (ICON). Students will have the opportunity to work with faculty to enhance their research capabilities through projects, especially related to robotics, autonomy and Internet-of-Things (IoT). Each project will be proposed by a faculty mentor with detailed information including project description and learning outcomes, etc. To get registered for this course, each student must choose a project with approval from a faculty mentor. All faculties affiliated with Institute for Control, Optimization and Networks (ICON) are eligible to serve as faculty mentor for this course. Students are allowed to work as a team or individual with faculty, or work with industry-funded projects, upon approval from course instructors.

## 2. Instructors, Faculty Mentors and Teaching Assistants

- **Course Instructors**

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| **Shaoshuai Mou** | Academic Point of Contact (POC) | mous@purdue.edu |
| **Shreyas Sundaram** | Academic POC | sundara2@purdue.edu |
| **Gerald A Janecko** | Administrative POC | gjanecko@purdue.edu |
| **Eric VandeVoorde** | Administrative POC | evandevo@purdue.edu |

- **Faculty Mentors:** All faculties affiliated with Institute for Control, Optimization and Networks (ICON) are eligible to serve as faculty mentor for this course. Researchers from industry are also eligible to serving as faculty mentors, pre-approved by course instructors.

- **Teaching Assistants:** TBD.

Students are encouraged to schedule weekly or bi-weekly meetings with faculty mentors for progress updates and Q&A. Students are also encouraged to use senior PhD students with outstanding research performance in faculty mentors' groups as additional supports.

## *3.* Course Description and Objectives

This course provides a project-based learning experience for the Professional M.S. Programs in robotics, autonomy and Internet-of-Things (IoT). In particular, students spend the semester focusing on a given project proposed by faculty mentors at Purdue University or with a pre-approved industrial mentoring team. The students expected to participate individually or in teams with the project faculty or industry mentors. Upon approval of course instructors, students are also allowed to team up together under supervision of one or more faculty mentors to accomplish the goals of challenging projects such as national or international competition related to Robotics/Autonomy/IoT. The main objective is to provide a means by which the students can improve and demonstrate their capabilities in topics related to robotics/autonomy/IoT. This includes interacting in a professional manner, solving technical problems of significant interest to industry and academia, and communicating technical issues using oral and written techniques.

Thus, this course provides a means by which to simulate interactions that are important for engineers as they start their professional careers.

## 4. Learning Resources, Technology & Texts

- **Informed Learning resources** such as technical papers or books to be specified by each faculty or industry mentor
- **Software and Hardware Resources.** Software for simulations and hardware (such as robotic and autonomous platforms) will be specified and potentially supported by mentor(s).
- **Tutoring support**. 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.

## 5. Learning Outcomes

By the end of the course, students will:

1. Be familiar with the cutting-edge topics related to their graduate study
2. Formulate clearly a problem statement, and achieve progress towards the solutions.
3. Write formal reports and professionally present results in both written, graphical and oral formats

## 6. Evaluation and Grading

In this class grades reflect the sum of achievement throughout the semester. Students will accumulate points given by the mentor(s) as described:

- **Attendance (20 Points):** This will be evaluated by your participation of weekly (or bi-weekly) progress update with faculty mentors through individual meetings or their research group meetings.
- **Progress (40 Points**): This will be evaluated by progress in formulating and solving a specific problem. Integration with computational models or implementation to hardware platforms may be needed depending on the type and scope of the project.
- **Professional Presentation Skills (20 Points):** Evaluated by oral presentation and written report at the end of the semester.
- **Bonus Points ( <= 3Points).** Bonus points might be given by the mentor(s) for student's outstanding performance beyond expectation, such as submitting a high-quality paper to internationally well-known conferences or top journals in the field, winning a prize at student competitions, significant progress in solving open and challenging problems in the field, etc.

The final grade will be translated into the following letters (there will be no partial points or rounding).

- A: 90-100
- B: 80-89
- C: 70-79
- D: 60-69
- F: 59 or below

## 7. Attendance Policy

This course is designed in a hybrid model, with some face-to-face meetings and others completed remotely. University policy states that students are expected to be present for every meeting of the classes in which they are enrolled. For the purposes of this course, being "present" means attending all face-to-face meetings unless you are ill or need to be absent for one of four "excused" reasons: grief/bereavement, military service, jury duty, or parenting leave (go to the Office of the Dean of Students website for details on how to submit those requests). Being "present" also means participating remotely and completing work assigned for days when we do not meet face-to-face. This work is required to help you meet the course learning outcomes. These times count toward the course contact hours and your course grade. Guidance on class attendance related to COVID-19 are outlined in the Protect Purdue Pledge on the Protect Purdue website.

## 8. Academic Guidance in the Event a Student is Quarantined/Isolated

If you must miss class at any point in time during the semester, please reach out to me via Purdue email so that we can communicate about how you can maintain your academic progress. If you find yourself too sick to progress in the course, notify your adviser and notify me via email or Brightspace. We will make arrangements based on your particular situation. Please note that, according to Details for Students on Normal Operations for Fall 2021 announced on the Protect Purdue website, "individuals who test positive for COVID-19 are not guaranteed remote access to all course activities, materials, and assignments."

## 9. Classroom Guidance Regarding Protect Purdue

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights and the Violent Behavior Policy under University Resources in Brightspace.

## 10. Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace table of contents, under University Policies.

## 11. Nondiscrimination Statement

A link to Purdue's Nondiscrimination Policy Statement is included in the Brightspace template under University Policies. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies.

## 12. Accessibility

In Brightspace under Student Help and Accessibility is a screenshot of the Student Resources Widget that links to the Disability Resource Center. Additionally, Purdue's Web accessibility policy and the Accessibility Standards for Brightspace are provided.
**Purdue University is committed to making learning experiences accessible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.**"

Purdue also offers resources to help you make learning materials accessible. Some examples include:

- Information from Innovative Learning on Universal Design for Learning
- Guidance from Innovative Learning on creating accessible documents
- Contact innovativelearningteam@purdue.edu with questions.

## 13. Mental Health/Wellness Statement

**If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack.** Sign in and find information and tools at your fingertips, available to you at any time.

**If you need support and information about options and resources**, please contact or see the Office of the Dean of Students. Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

**If you find yourself struggling to find a healthy balance between academics, social life, stress**, etc. sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at evans240@purdue.edu.

14. **If you're struggling and need mental health services**: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours.

## 15. Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Considering the significant disruptions caused by the current global crisis as it related to COVID-19, students may submit requests for emergency assistance from the Critical Needs Fund

## 16. Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this

course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.