Course Outline

Term 1 2020

MTRN4010

ADVANCED AUTONOMOUS SYSTEMS

Contents

1. Staff contact details

Contact details and consultation times for course convenor

Name: Dr Jose Guivant
Office location: Building J17, Room 510D
Tel: (02) 9385 5693
Email: j.guivant@unsw.edu.au

Consultations will take place in L212/J18. The consultation timeslots will be announced later. Consultations are possible outside the set times, but a prior appointment is preferred. Email, telephone and Moodle discussions can also be used for solving more general issues.

Contact details and consultation times for additional lecturers/demonstrators/lab staff

Name: Dr Ngai Ming Kwok
Office location: Building J17, Room 510C
Tel: (02) 9385 6091
Email: nmkwok@unsw.edu.au

Consultation by email appointment.

Please see the course Moodle.

2. Important links

- Moodle
- Lab Access
- Health and Safety
- Computing Facilities
- Student Resources
- Course Outlines
- Engineering Student Support Services Centre
- Makerspace
- UNSW Timetable
- UNSW Handbook
- UNSW Mechanical and Manufacturing Engineering

3. Course details

Credit points

This is a 6 unit-of-credit (UoC) course and involves 4.5 hours per week (h/w) of face-to-face contact.

The normal workload expectations of a student are approximately 25 hours per term for each

Student learning outcomes

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

After successfully completing this course, you should be able to:

Learning Outcome		**EA Stage 1 Competencies**
1.	Understand the general theory of Bayesian Estimation. Understand the theory and application of the Kalman Filter (KF and EKF) for solving diverse types of problems in the area of Engineering	PE1.1
2.	Understand methods such as Neural Networks, Fuzzy Logic and PSO.	PE1.1
3.	Be able to develop software for applying the theory, and actually solving complex problems. Have experience in using state-of-the-art sensors, used in Field Robotics and Autonomous Systems.	PE2.3

4. Teaching strategies

Teaching of this course is implemented through lectures to cover the theory, and project sessions to put those concepts in practice. All laboratory/project work is individual work, and attendance is necessary.

The provision of the learning environment in the laboratory is to facilitate students developing confidence in managing laboratory tasks as projects. Demonstrators in the laboratories are there to provide guidance and assistance in managing the laboratory tasks.

Examples (e.g. source code) for the projects are provided by the Lecturer, to help in the understanding and full implementation of the projects. Project complexity is incremental, to allow the student to finally complete the solution of a complex problem.

Lectures have a nominal duration of 2.5 hours. However, the last ½ hour is intended to be dedicated to discussions, and clarification of concepts; and for showing related material, which may be useful for helping the understanding of the previously presented material.

6. Assessment

Assessment overview

Assessment task	Group Project?	If

Project overview