**ELG 5161 Robotics: Control, Sensing and Intelligence**

*September 06 – December 06, 2017*

http://catalogue.uottawa.ca/en/courses/elg/


* Students must attend all lecture sessions *

**Professor:** Emil M. Petriu, [http://www.site.uottawa.ca/~petriu/](http://www.site.uottawa.ca/~petriu/), petriu@uottawa.ca

**Marking Scheme**

* Please note that due to the nature of this course, it will not be possible to evaluate and return academic work pertinent to this course that is worth at least 25% of the final course mark no later than one week prior to the deadline for withdrawal without academic penalty.

- **Assignments** .... 10%
- **Project report** ... 50%
- **Final exam** ..... 40%

**Time Line**

- **Nov. 20th- Dec.6th, 2017:** Class Presentations of projects – each presentation is 10 minutes (around 10 slides);
- **Dec. 6th, 2017:** Take home exam is issued;
- **Dec. 11th, 2017, 8:00 AM:** Take home exam due (electronic format/no_handwriting);
- **Dec. 15th, 2017, 11:55 PM:** Final project report is due. Final report should be about 30 pages in length (electronic format/no_handwriting). If computer code is developed, it should be submitted as an annex and will not be included in the total page length.

**Course organization:**

- **Introduction:** Robotics as the intelligent connection of the perception to action. Industrial robotics. Robot manipulators and mobile robots. Robot sensors: proprioceptors and exteroceptors. Advanced robotic systems
- **Sensor-Based Robot Control:** Robot arm kinematics and dynamics. Trajectory planning. Control of robot manipulators.
- **Perception:** Multisensor data fusion and world modeling.
Robot Intelligent Control: Neural Networks (NN) and fuzzy logic techniques for intelligent control and perception. Task-level programming. Flexible manufacturing systems. Behavior-based neuro-fuzzy control.


References:


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