



Department of Electrical and Computer Engineering

COURSE OUTLINE

ELEC 426 – Robotics Spring 2018

ALL INFORMATION ON ELEC 426 CAN BE FOUND AT:
<http://www.ece.uvic.ca/~panagath/ELEC426/ELEC426.html>

Instructor: Dr. Pan Agathoklis

Phone: 721-8618
E-mail: pan@ece.uvic.ca

Office Hours:

Days: Wednesdays, Fridays
Time: 11:00 AM – 12:00 noon
Location: EOW 423

Course Objectives: Introduction to manipulator kinematics.
Understanding the mathematical tools used for manipulator kinematics and trajectory planning.
Introduction to manipulator dynamics and basis types of manipulator controllers.

Syllabus: Structure and specification of robot manipulators. Homogenous transformations. Link description. Manipulator kinematics. Inverse manipulator kinematics. Velocity and static forces in manipulators. An introduction to manipulator dynamics. Linear control of robot motion. Model-based nonlinear control of robot manipulators. (*Prerequisite: ELEC 360; and ENGR 141 or MECH 245; and PHYS 110 or PHYS 122*)

Learning Outcomes:

1. Apply matrix transformation arithmetic.
2. Describe position, orientation and frames.
3. Describe manipulator link connections.
4. Analyze manipulator kinematics in joint and Cartesian spaces.
5. Give examples of manipulator kinematics.
6. Analyze inverse manipulator kinematics.
7. Explain manipulator dynamics and basic controller structures.

Lectures:

Section(s): A01 CRN:21120
Days: Mon. and Thurs.
Time: 11:30am – 12:50pm
Location: ELL 061

Labs:

Location: ELW A317

<u>Section(s)</u>	<u>Days</u>	<u>Time</u>
B01, B02	Mon	14:30-17:30
B03, B04	Tues.	15:30-18:30

Textbook:

Title: Introduction to Robotics
Author: John Craig
Publisher: Pearson Education
Year: 2018, 4th ed.

Labs are starting the week of Jan. 29 (B02, B04)

Labs are starting the week of Feb. 5 (B01, B03)

Assessment:

Assignments:	5%
Labs	15%
Mid-term	25%
Final	55%

Date: February 8, 2018

Date: TBA

Note: Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar.

<https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/grading.html>

Assignment of E grade and supplemental examination for this course will be at the discretion of the Course Instructor. The rules for supplemental examinations can be found in the current Undergraduate Calendar.

<https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/exams.html#>

Note to students: Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Assistant to set up an appointment.

Accommodation of Religious Observance:

<https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/religious-observanc.html>

Policy on Inclusivity and Diversity:

<https://web.uvic.ca/calendar2018-01/general/policies.html>

Standards of Professional Behaviour: You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities.

<https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Undergraduate Calendar for the UVic policy on academic integrity.

<https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/academic-integrity.html>

Equity: This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Resource Centre for Students with a Disability located in the Campus Services Building.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Course Lecture Notes: Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.