



Mechanical and Manufacturing Engineering

Course Outline

Semester 2 2017

MANF3510

PROCESS TECHNOLOGY AND
AUTOMATION

Contents

1. Staff contact details	2
Contact details and consultation times for course convenor	2
Contact details and consultation times for additional lecturers/demonstrators/lab staff	2
2. Important links	2
3. Course details	2
Credit Points	2
Contact hours	3
Summary and Aims of the course	3
Student learning outcomes	4
4. Teaching strategies	5
5. Course schedule	6
6. Assessment	7
Assessment overview	7
Assignments	8
Quiz 1 and 2	8
Presentation	8
Submission	8
Marking	9
Other assessments	9
Examinations	9
Calculators	10
Special consideration and supplementary assessment	10
7. Attendance	10
8. Expected resources for students	10
Textbooks:	10
Reference books:	10
9. Course evaluation and development	11
10. Academic honesty and plagiarism	11
11. Administrative matters and links	12
Appendix A: Engineers Australia (EA) Competencies	13

1. Staff contact details

Contact details and consultation times for course convenor

Name: Dr Alexander Green

Office Location: Ainsworth Building (J17), Room 507

elements, power transmission, controllers, communication, operator interfaces and support systems.

Topics include:

- Function and control of CNC machine tools
- Sensors and actuators in automated systems
- Programming of CNC machine tools and PLCs
- Design and integration of machine elements
- Programmable logic controllers
- CAD/CAM principles and programming (SolidWorks and SolidCam)

This course includes a substantial amount of laboratory work in order to gain a deeper understanding of the discipline of machine design and operation.

The course will combine lectures with practical case studies that require the theory taught to be applied to actual machine systems.

The course aims to develop you into a skilled and all-rounded process design engineer able to carry out and manage the key design processes in parallel and concurrently. Design is inherently complex and a systematic, yet flexible, agile and interdisciplinary 11.l6(c)-2(,2,5c 0r)42(e)10.5(s)-

5. Course schedule

Week	Lecture Topic	Lab/Quiz
1	Introduction to Automation & Technology	No lab in week 1
2	Binary, Boolean Logic and Transistors	Lab Introduction
3	Lecture: Computer Hardware and PLCs	Install Omron Software on Student PCs.
4	Sensors, Controllers, Programmable Logic Controllers 1	PLC Basics
5	Programmable Logic Controllers 2, Communications	Quiz1: Control, sensing, technology, PLCs.
6	Artificial Intelligence and Automation	PLC Intermediate Exercises
7	Power, Cabling, Actuators and Motors	PLC Assignment Development
8	HMI, SCADA, Data Acquisition	PLC Assignment Development
9	Design and Control of CNC Machines, ISO code	PLC Assignment Practical Demonstrations
	MID SEMETER BREAK	
10	Machine and System Design	CNC
11	Structural and Machine Elements, Machine Mechanisms	

6.

For further information on exams, please see the [Exams](#) section on the intranet.

Calculators

You will need to bring your own calculator to the exam.

3. Low-cost Jigs, Fixtures & Gages, for limited production, Boyes W.E. ed., Society of Manufacturing Engineers, 1986, Dearborn, Michigan.
4. Fundamentals of Modern Manufacturing, Groover M.P., 2nd ed., 2002 John Wiley.

9. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussion in the final class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

In this course, recent improvements resulting from student feedback include access to CNC machinery and improved material on design and SolidCam.

10. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism: student.unsw.edu.au/plagiarism The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as stealing another student's work or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable