



UNSW
AUSTRALIA

Course Outline

Semester 2 2015

Never Stand Still

Engineering

Mechanical and Manufacturing Engineering

MECH3110

MECHANICAL DESIGN 1

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1. Staff Contact Details

Contact details and consultation times for course convenor and lecturer

Dr Kana Kanapathipillai
Room: J17/408J

Summary of the Course

This course will continue the development of a systematic approach to problem solving and design that commenced in earlier courses. It will focus on mathematical modelling for design applications; force flow through components and assemblies; belt and chain drive design; rolling element bearing selection; dynamically-loaded bolted connections and welded-joint design; shaft design and explore these ideas in terms of practical applications.

Aims of the Course

The course follows on from the introduction provided by ENGG1000, extends the machine element design approach introduced in MMAN2100 and provides an opportunity to apply the mechanical knowledge and techniques gained from MMAN2400 and MMAN3400. You will interact as part of a design team, while developing design solutions for a realistic problem of reasonable size and complexity. The lecture topics relate closely to assignment requirements with a balance between theory and practice. Assessment will have a strong emphasis on practical design knowledge and skills as well as a high standard of professional written and graphical communication. This will include researching information for design assignments and searching for solutions as task specifications become less complete and more realistic.

Student learning outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. Demonstrate the ability to utilise the process of engineering design and appropriate design methods for defining an open-ended design problem, generating alternative conceptual solutions, evaluating these solutions and implementing them.	PE 1.1, 1.2,1.5, 2.1, 2.3, 2.3, 2.4
2. Demonstrate the ability to manage a design project and be able to plan, schedule and document work activities in accordance with standard practice.	PE 1.3, 1.6, 2.1, 2.3, 2.4, 3.2, 3.3, 3.6

3. Demonstrate the ability to collabo0.005 Tc 0 Tw 1.946 00 Tv

4. Course schedule

TUESDAY 3-4
Ritchie Theatre

	3rd Hour	Colombo LG02/ Quad G032/ Quad G034/ EE 418		
		Semester Break	Semester Break	
06 Oct	10	L19 - Welded Joint 2	L20- Welded Joint 3	T6
	2nd Hour	Problem solving guidance Colombo LG02/ Quad G032/ Quad G034/ EE 418	Cad Labs ME203/204	
	3rd Hour			
13 Oct	11	L21 – Bolted Joint 1	L22 – Bolted Joint 2	
	2nd Hour	Problem solving guidance Colombo LG02/ Quad G032/ Quad G034/ EE 418	Cad Labs ME203/204	
	3rd Hour			
20 Oct	12	L23 – Bolted Joint 3	L24 - Revision	T7
	2nd Hour	Problem solving guidance Colombo LG02/ Quad G032/ Quad G034/ EE 418	Cad Labs ME203/204	
	3rd Hour			
27 Oct	13	NO LECTURE		

Task	Assignment	Mark	Contri - bution	Learning Outcomes assessed	Assessment criteria	Due
T1	Preliminary Design Report	10%	Group	1, 2, 3, 4, 5	Project Management plan & initial design concepts of a bogey platform system	Week 4 (11 pm, Friday)
T2	Belt, Chain & Bearing Assignment	15%	Group	1, 2, 3, 4, 5	Designing chain, belt & selecting bearings for power transmission	Week 6 (11 pm, Friday)
T3	Quiz 1	6%	Individual	4	Belt, Chain & Bearing	Week 7 (4 pm Tuesday)
T4	Shaft & flywheel Assignment (on line)	10%	Individual	1, 4	Shaft and Flywheel Design	Week 8 (11 pm, Friday)

T5 Quiz 2 6%

Examination

There will be no final examination for this course during the formal university examination period.

Calculators

You will need to provide your own calculator, of a make and model approved by UNSW, for the quizzes. The list of approved calculators is shown at <https://student.unsw.edu.au/exam-approved-calculators-and-computers>

Special Consideration and Supplementary Assessment

For details of applying for special consideration and conditions for the award of supplementary assessment, see [Administrative Matters](#), available on the School website and on Moodle, and the information on UNSW's [Special Consideration page](#).

6. Expected Resources for students

Recommended Textbook:

Mechanical Engineering Design", J.E. Shigley & C.R. Mischke, 10th Ed, McGraw Hill (Book Store)

Suggested readings:

Machine Design: An Integrated Approach, R.L. Norton, 3rd Ed, Pearson (Library)

Design of Machine Elements, M.F. Spotts, et. al, 3rd Ed, Pearson (Library)

www.mhhe.com/shigley

There are numerous valuable resources available on the web and additional sources will be provided in lectures and adaptive tutorials.

Students seeking additional resources can also obtain assistance from the UNSW Library. One starting point for assistance is: info.library.unsw.edu.au/web/services/services.html

7. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the Course and Teaching Evaluation and Improvement (CATEI) 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.

8. 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: <https://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:

<http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf>

Further information on School policy and procedures in the event of plagiarism is presented in a School handout, [Administrative Matters](#), available on the School website.

9. Administrative Matters

You are expected to have read and be familiar with *Administrative Matters*, available on the School website: https://www.engineering.unsw.edu.au/mechanical-engineering/sites/mech/files/u41/S2-2015-Administrative-Matters_20150721.pdf

This document contains important information on studCID 22 >>n tosicd

Expectations of students

UNSW expects regular attendance at lectures and problem solving guidance/laboratory classes. Although exceptions may be made for special circumstances, we do expect University commitments to take precedence over regular work activities, holidays etc. UNSW has rules for computer use, for example, for email and online discussion forums.

Kana Kanapathipillai
20/07/2015

AppendixA: Engineers Australia (EA) Professional Engineer Competency Standard

	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