UNSW AUSTRALIA

Course Outline

Semester 1 2015

Never Stand Still | Faculty of Engineering | School of Mechanical and Manufacturing Engineering

MANF9544

Concurrent Product and Process Development

CONTENTS

COURSE OUTLINE
MANF9544 CONCURRENT PRODUCT & PROCESS DEVELOPMENT

1. STAFF CONTACT DETAILS

Contact details for course convener

Professor Sami Kara (Lecturer In-charge)
Room: Bld F21, 123A
Ph: 9385 5757
Fax: 9663 1222
E-Mail: S.Kara@unsw.edu.au

Consultation concerning this course is available on Monday 1000 –1400 whenever I am not otherwise engaged.

Contact details for additional lecturers

Dr. Wen Li
Room: F21
Ph: 9385 6961
Email: w.li@unsw.edu.au

2. COURSE INFORMATION

Units of credit

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

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all assessable work.”

For a standard 24 UoC in the session, this means 600 hours, spread over an effective 15 weeks of the session (thirteen weeks plus stuvac plus one effective exam week), or 40 hours per week, for an average student aiming for a credit grade Various factors, such as your own ability, your target grade, etc., will influence the time needed in your case. Some students spend much more than 40 h/w, but you should aim for not less than 40 h/w on coursework for 24 UoC.

There will be no parallel teaching in this course.

Summary of the course

This course introduces the core activities of concurrent development of products, processes, systems, and quality. Therefore this course is a core part of the MEngSc program in Manufacturing Management and relates its contents to other courses in the program such as Manufacturing Strategies, Managing Manufacturing Operations and Production Technologies.

Aims of the course

The need for companies to develop the every product that the customer wants and to do this in the shortest possible time has become one of the main success factors on the market. Concurrent Product and Process Development is one of the new strategies that address this problem of fast product development and customer satisfaction by taking into account economic and environmental objectives. It needs new techniques and design tools to be adopted, and it requires a change of the traditional departmental separation of tasks in a company.

Therefore, this course aims to provide an understanding of the integrative nature of concurrent product and process development in a team work environment, and how it affects all subsequent activities in production.

Expected student learning outcomes (including those related to graduate attributes)

By the end of this course, students are expected to have

- have gained knowledge in the inter-disciplinary field of concurrent product development,
- have gained the capacity for critical thinking and problem solving, have experienced collaborative and multi-disciplinary work,
- learned to appreciate the difficulties of change, and acquired skills of effective communication.

These outcomes are addressed in the course by emphasising the inter-disciplinary and integrative nature of the product development process and the problems of change management. Collaboration and team work is the focus of a major assignment on QFD, where communication skills are essential. The technique of Design for Assembly is used in another assignment as an example to demonstrate the principles of concurrent design and to enhance problem solving skills.

3. RATIONALE FOR INCLUSION OF CONTENT AND TEACHING APPROACH

Effective learning is supported when you are actively engaged in the learning process and by a climate of enquiry, and these are both achieved in the lectures and problem solving classes by way of practical case studies.

You become more engaged in the learning process if you can see the relevance of your studies to professional, disciplinary and/or personal contexts, and the relevance is shown in all parts of the lectures and assignments by way of examples drawn from industry.

Dialogue is encouraged between you, others in the class and the lecturers. Diversity of experiences is acknowledged, as some students in each class have prior industry experience. Your experiences are drawn on to illustrate various aspects, and this helps to increase motivation and engagement.

It is expected that assignments will be marked and handed back in the week following submission. You will have feedback and discussion, while the assignment is fresh in your mind, to improve the learning experience.

4. TEACHING STRATEGIES

The subject will be presented in the form of lectures and problem solving classes. Each weekly class will consist of a 1-1.5 hrs lecture followed by a problem solving class example or case study related to the material covered in the lecture

5. ASSESSMENTS

You are assessed by way of both examinations and projects (Assignments 1, 2, 3) which involve both descriptive material and hands-on cases. These projects test your ability to demonstrate applied knowledge, which you will be expected to perform as a postgraduate.

The mid-session tests are "closed book" examinations to assess the student's knowledge of the discipline. All assignments are based on team work (depending on class size, groups of two students might be used).

The various parts of the course contribute towards the overall grade as follows (see the course schedule for the timing of assignments):

Mid-Session Test 1	20%
Mid-Session Test 2	20%

Assignment 1	20%
Assignment 2	20%
Assignment 3	20%

Late submission

Late submissions attract a penalty of ten percent per *day*, unless prior dispensation has been given; i.e. see the lecturer before the due date to avoid penalty. It is always worth submitting as, in the event of difficulty making the final grade, any late penalties may be removed.

Calculators

You will need to provide your own calculators, of a make and model approved by UNSW, for the examination. The list of approved Calculators is shown at https://student.unsw.edu.au/exam-approved-calculators-and-computers. It is your responsibility to ensure that your calculator is of an approved make and model, and to obtain an ”Approved” ticker from the School Office or the Engineering Student Centre prior to the examination. Calculators not bearing an “Approved” sticker will not be allowed into the examination room.

Special Consideration and Supplementary Assessment

For details for applying for special consideration and conditions for the award of supplementary assessment, see “*Administrative Matters*”, available on the School website.

6. ACADEMIC HONESTY AND PLAGIARISM

Plagiarism is using the words or ideas of others and presenting them 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 booklet which provides essential information for avoiding plagiarism: https://my.unsw.edu.au/student/academiclife/Plagiarism.pdf

There is a range of resources to support students to avoid 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. Information is available on the dedicated website Plagiarism and Academic Integrity website: http://www.lc.unsw.edu.au/plagiarism/index.html

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 a 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.

8. COURSE SCHEDULE

All lectures in this course are given by Prof. S. Kara unless stated otherwise.

Monday 14:00-17:00 Block House: 204

Date	Week	Topics
2/3	1	Unit 1: Introductions and Definitions
9/3	2	Unit 2: The Product Development and Time-to-Market Concept
16/3	3	Unit 3: Operating Concurrent Engineering Teams
23/3	4	Unit 4: Quality Function Deployment – Part 1 **Handing in Assignment 1**
30/3	5	Unit 5: Quality Function Deployment – Part 2
6/4	-	Session Break
13/4	6	Unit 6: Design for Manufacture (DFM) ***Mid-Session Test 1***
20/4	7	Unit 8: Design for Environment (Lecturer to be announced) ***Submission of Assignment 1***

27/4	8	Unit 7: Design for Assembly (DFA) **Handing in Assignment 2**
4/5	9	Unit 9: System Design
11/5	10	Unit:10 Rapid Prototyping **Submission of Assignment 2** **Handing in Assignment 3**
18/5	11	Unit 11: Organisation and Management of CE Teams
25/5	12	Unit 12: CE Practices and Case Studies (Industry Speaker – TBA) **Submission of Assignment 3**
1/6	13	**Mid-Session Test 2**

9. RESOURCES FOR STUDENTS

Textbooks

A subject manual will be uploaded on the Moodle as a softcopy. This manual includes all the necessary lecture materials and the readings at the end of each unit. Since the manual is updated recently, the previous version of the manual is not recommended. Copies of the current version are also available at the library for student barrowing.

Suggested Additional Readings

1. Thomas A. Salomone: "What every Engineer should know about CONCURRENT ENGINEERING", Marcel Dekker, 1995.
2. James L. Nevins, Daniel E. Whitney: "Concurrent Design of Products and Processes", A Strategy for the Next Generation in Manufacturing, McGraw-Hill Publishing Company, 1989. (good textbook but out of print)
3. Andrew Kusiak: "Concurrent Engineering", Automation, Tools, and Techniques, John Wiley & Sons Inc., 1993.
4. 4. John Corbett, Mike Dooner, J. Meleka, C. Pym: "Design for Manufacture", Strategies, Principles, and Techniques, Addison-Wesley Publishing Company, 1991.
5. Paul G. Ranky: "Concurrent/Simultaneous Engineering", Methods, Tools and Case Studies.
6. CIMware Limited, Guildford, England, 1994.
7. Geoffrey Boothroyd, Peter Dewhurst, Winston Knight: "Product Design for Manufacture and Assembly", Marcel Dekker, 1994.
8. Goeffrey Boothroyd, Peter Dewhurst: "Product Design for Assembly", Handbook, Boothroyd Dewhurst Inc, 1991.

9. Kim Clark, Stephen Wheelwright: "Managing New Product and Process Development" and "Revolutionizing Product Development", Free Press, New York, 1993.
10. Sammy G. Shina: "Successful Implementation of Concurrent Engineering Products and Processes." Van Nostrand Reinhold, New York, 1994.
11. Ben Wang: "Integrated Product, Process and Enterprise Design." Chapman & Hall, 1997.

Additional materials provided in UNSW Moodle

This course has a website on UNSW Moodle which includes:

- copies of the course outline
- copies of lecture material.
- copies of assignments (as they are issued, in case you missed the hand-out in class)
- a discussion forum.

The discussion forum is intended for you to use with other enrolled students. The course convenor will occasionally look at the forum, monitor the language used and take note of any frequently-asked questions, but will not respond to questions on the forum. If you want help from the convenor then direct contact is preferred.

Recommended Internet sites

None

9. 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 problem solving 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 a reduction in the number of assignments and the introduction of material on the influence of shallow water and squat on ship performance in lieu of further prediction methods. Other recent improvements include a re-arrangement of lecture material on gas turbines, and a re-wording of the assignment on gas turbines.

10. ADMINISTRATIVE MATTERS

You are expected to have read and be familiar with *Administrative Matters*, available on the School website. This document contains important information on student

responsibilities and support, including special consideration, assessment, health and safety, and student equity and diversity.

Prof. S. Kara
February 2015