



The University of Southern Queensland

## Course specification

### Description: Mechanical Practice 3

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
MEC	3903	54482	2, 2006	EXT	0.00	Toowoomba

<b>Academic group:</b>	FOENS
<b>Academic org:</b>	FOES02
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	030799

### STAFFING

Examiner: Peter Penfold

Moderator: Bob Fulcher

### RATIONALE

The successful practice of the profession of Mechanical Engineering requires a clear understanding of the relationship between engineering and engineering practice. An ability to recognise when a particular theory is applicable and an ability to accommodate the deviations from the theory that occur in the real world is essential. Some knowledge of a wide range of practical techniques, proprietary devices, materials, construction methods etc is also necessary. The engineer must be able to assess a complex situation, identify the critical elements and develop a workable, cost effective solution. All of this requires considerable self-confidence, and the ability to work with and lead teams.

### SYNOPSIS

The course comprises two parts - engineering metrology and computer assisted machining. It is the aim of this course to provide students with practical skills associated with each of these areas. Metrology activities include precision measurement of component features, form and geometry utilising specialised measuring instruments and equipment. Subsequent analysis and presentation of measurement data also form part of metrology. Computer assisted machining encompasses NC programming methods, program preparation, program verification and machining utilising computer software and technologies. The activities will be carried out individually and in groups.

### OBJECTIVES

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. On completion of this course, students should be able to:

1. conduct and utilise an engineering test in accord with a given general requirement;  
(Report 2 Metrology)
2. operate a range of engineering metrology equipment and analyse the data obtained;  
(Report 2 Metrology)

3. co-operate within a team-work environment; (Report 1 CNC and CAM; Report 2 Metrology))
4. prepare CNC programs to machine a number of simple engineering components; (Report 1 CNC and CAM)
5. participate in the CNC machining process for two simple engineering components; (Report 1 CNC and CAM)

## TOPICS

Description	Weighting (%)
1. Metrology practical tests	35.00
1.1. Alignment Testing	
1.2. Angle and Parallelism Measurement	
1.3. Dimensional Measurement	
1.4. Thread Measurement	
1.5. Spur Gear Testing	
1.6. Slip Gauges and Comparator Measurement	
1.7. Surface Finish Measurement	
1.8. Profile Projector Measurement	
2. Computer Assisted Machining	65.00
2.1. NC programming	
2.2. Program preparation with CAM	
2.3. Tool-path simulation/program verification	
2.4. NC machine set-up and operation	
2.5. Health and safety considerations when operating NC machinery	

## TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

3.5" Floppy Disk

## REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

*MEC3204 Production Engineering Study Book 2*, USQ Publication, Toowoomba.

De Garmo, EP, Temple Black, J & Kohser, RA 2002, *Materials and Processes in Manufacturing*, 9th edn, Wiley, New York.

Gayler & Shotbolt 1990, *Metrology for Engineers*, 5th edn, Cassell Publishers,

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Laboratory or Practical Classes	40.00
Report Writing	10.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
REPORT 1 - CNC AND CAM	1.00	65.00	13 Oct 2006
REPORT 2 - METROLOGY	1.00	35.00	13 Oct 2006

## IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:  
This course requires attendance at a residential school. It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements for students to complete each assessment item satisfactorily:  
To satisfactorily complete assessment one students must participate in NC machining activity and submit programs and tool-plots as prepared during the NC and CAM activities. To satisfactorily complete assessment two students must submit the results and data obtained from the metrology activities. If, in the opinion of the examiner, the accuracy of results is below the standard specified in the assessment scheme then students may be required to resubmit their assessments.
- 3 Penalties for late submission of required work:  
Practical reports submitted after the due date will not be assessed.
- 4 Requirements for student to be awarded a passing grade in the course:  
To be assured of receiving a passing grade students must satisfactorily complete (as defined in Statement 2) at least 80% of the practical and other activities.
- 5 Method used to combine assessment results to attain final grade:  
As P is the only passing grade available for this course, all students who are qualified for a passing grade, under the requirements in 4 above, will be given a grade of P. Other students will be given either a Failing grade or an Incomplete grade.

- 6 Examination information:  
There is no examination in this course.
- 7 Examination period when Deferred/Supplementary examinations will be held:  
Not applicable.
- 8 University Regulations:  
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

## **ASSESSMENT NOTES**

- 1 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.
- 2 Students must retain a copy of each item submitted for assessment. This must be despatched to USQ within 24 hours if required by the Examiner.
- 3 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.
- 4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.
- 5 The Faculty will NOT accept submission of assignments by facsimile.
- 6 Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.
- 7 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.
- 8 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.