



1. Staff contact details	2
Contact details and consultation times for course convenor	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.....	3
4. Teaching strategies	4
5. Course schedule	4
6. Assessment.....	6
Assessment overview.....	6
Assignments	7
Written reports.....	7
Submission.....	7
Marking	7
Examinations	8
Online Quiz	8
Calculators	8
Special consideration and supplementary assessment	8
7. Attendance.....	8
8. Expected resources for students	9
9. Course evaluation and development	9
10. Academic honesty and plagiarism	9
11. Administrative matters and links	10
Appendix A: Engineers Australia (EA) Competencies	11

1. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Contact details and consultation times for course convenor

Name: Dr Ron Chan
Office Location: Room ME507, Ainsworth Building
Tel: (02) 9385 1535
Email: r.chan@unsw.edu.au

Name: Dr Erik van Voorthuysen
Office Location: ME507, Ainsworth Building
Tel: (02) 9385 4147
Email: erikv@unsw.edu.au

Consultation concerning this course is available immediately after the classes. Direct consultation is prpan4o2ET /Shn5(pan4o4* 4147)]TJ 0 Tc 72 w 5.804 0 Td ()Tj EMC /P <</2CID 14 >

Contact hours

| | Day | Time | Location |
|-----------------------|------------|---------------|-----------------|
| Lectures | Friday | 12:00 – 15:00 | Ainsworth 202 |
| Demonstrations | Friday | 15:00 – 16:00 | Ainsworth 202 |

Please refer to your class timetable for the learning activities you are enrolled in and attend only those classes.

Summary and Aims of the course

The course will introduce statistics, mathematics and associated techniques for analysing an industrial process for the purpose of maintaining and improving it. Major disciplines covered include issue analysis, data collection, statistical data analysis, process modeling, decision-making and implementation. The course focuses on developing experimental techniques using statistical methods to test the performance of the processes in a manufacturing industry. It lays the foundations for testing products, components, machinery and processes. This is necessary for the development of quality products and processes. This leads to the development of quality assurance methods for products as well as the development and understanding of the reliability of the processes on the shop-floor. This is necessary to maintain maximum up-time and return-on-assets for a manufacturing facility.

This course aims to develop the concept of data gathering, analysis and modeling using statistical methods. In attempting to determine if the processes or products are meeting set criteria, the manufacturing engineer should carry out tests that will enable him or her to make a judgment with a certain level of confidence. The fundamental aim of the course is to present a comprehensive overview of methodologies and analyses in the fields of process improvement, process characterisation, reliability and maintenance engineering. Reliability and maintenance management are a collection of tools and methodologies to achieve machinery and process integrity and performance. One of the main foundations of reliability and maintenance engineering is that it is a top-down bottom up driven strategy, regardless of the specific reliability and maintenance philosophies adopted. The aim is to provide students with a comprehensive overview of process improvement and maintenance strategies, methodologies and analytical foundations that form part of this important field. The challenge for process improvement and maintenance engineering is to develop the most effective and at the same time efficient strategy for managing the performance, capability and condition of plant & equipment so as to meet or exceed com.6(v)8n.6(i)2.6 4.1.3(m)-6(eet)6.6(9c2(i)2.6(enti)2.6(T7(i)2.7

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

| Learning Outcome | EA Stage 1 Competencies |
|-----------------------------------------------------------------------------------------------|--------------------------------|
| 1. Understand the different statistical methods available for analysis of different processes | PE1 |

| | | | |
|----------------------------------|------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------|
| Week 3
Fri
11/08/17 | Hypothesis testing –
Student’s t-test | Textbook 1 – Chapter
7,8 and 9 and Lecture
notes | Hypothesis testing in
Minitab 17 |
| Week 4
Fri
18/08/17 | Analysis of variance
(ANOVA) | Textbook 1 – Chapter
12 and Lecture notes | ANOVA in Minitab 17 |
| Week 5
Fri
25/08/17 | Analysis of variance
(ANOVA) Part II | Textbook 1 – Chapter
12 and Lecture notes | Advanced ANOVA in
Minitab 17 |
| Week 6
Fri
01/09/17 | Simple and multiple
linear regression | Textbook 1 – Chapter
14 and Lecture notes | Linear regression in
Minitab17 |
| Week 7
Fri
08/09/17 | Wrap-up session and
support on assignment 1 | Lecture notes only | Wrap-up session and
support on assignment
1 |
| Week 8
Fri
15/09/17 | Component reliability
and Weibull analysis | Textbook 1 – Chapter
1, Textbook 2 –
Chapter 1 and 2 and
Lecture notes | Questions on basic
reliability analysis |
| Week 9
Fri
22/09/17 | System reliability and | | |

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Assessment overview

| Assessment | Length | Weight | Learning outcomes assessed | Assessment criteria | Due date and submission requirements | Deadline for absolute fail | Marks returned | |
|-------------------|---------------|---------------|-----------------------------------|----------------------------|---------------------------------------------|-----------------------------------|-----------------------|--|
|-------------------|---------------|---------------|-----------------------------------|----------------------------|---------------------------------------------|-----------------------------------|-----------------------|--|

Assignments

The assignments will be posted on Moodle or handed out in class and a reminder announcement made about due date for the assignments. The assignments support the learning outcomes by incorporating an appropriate mix of activities such as issue analysis, fact based data analysis that support the design of appropriate solutions and strategies. The assignments also support collaborative team work and integration of different ideas and components into an overall coherent quality management strategy.

The following criteria will be used to grade assignments:

Written reports

- x Analysis and evaluation of assignments by integrating knowledge gathered in lectures, demonstration sessions and textbook
- x Sentences in clear and plain English—this includes correct grammar, spelling and punctuation
- x Correct referencing in accordance with the prescribed citation and style guide
- x Appropriateness of analytical techniques used
- x Accuracy of numerical answers
- x All working shown
- x Use of diagrams, where appropriate, to support or illustrate the calculations
- x Use of graphs, where appropriate, to support or illustrate the calculations
- x Use of tables, where appropriate, to support or shorten the calculations
- x Neatness

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Submission

Late submissions will be penalised 5 marks per calendar day (including weekends). An extension may only be granted in exceptional circumstances. Special consideration for assessment tasks must be processed through student.unsw.edu.au/special-consideration.

Examinations

There is no final exam for this course.

Online Quiz

Four quizzes (quiz 1, 2, 3 and 4) will be conducted online via Moodle. The format of the quiz is like those that are done on paper, which consists of multiple choice questions, calculations and short answer questions. The link to the quiz will be available on Monday of the quiz week; the link will remain open until 5pm, Friday of the same week. Each student gets ONE attempt to complete the quiz within a set time limit. The feedback of the quiz will be provided after the quiz is closed. Note that the quiz questions are randomly drawn from a question bank with similar theme and difficulty, numerical questions may appear with random input numbers, so students will not expect to get the exact same question. Students are expected to complete the quiz individually.

Calculators

You will need to provide your own calculator, of a make and model approved by UNSW, for the examinations. The list of approved calculators is shown at 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” sticker for it 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 of applying for special consideration and conditions for the award of supplementary assessment, see the [School intranet](#), and the information on UNSW’s [Special Consideration page](#).



You are required to attend a minimum of 80% of all classes, including lectures, labs and seminars. It is possible to fail the course if your total absences equal to more than 20% of the required attendance. Please see the [School intranet](#) and the [UNSW attendance page](#) for more information.

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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 a

