Unit Outline
307725 Geophysical Data Analysis 102
Semester 1, 2013

Unit study package number: 307725
Mode of study: Internal
Tuition pattern summary: Lecture: 2 x 1 Hours Weekly
Computer Laboratory: 2 x 2 Hours Weekly
Fieldwork: 2 x 1 Days Yearly
This unit does not have a fieldwork component.
Credit Value: 25.0
Pre-requisite units: Nil
Co-requisite units: Nil
Anti-requisite units: Nil
Result type: Grade/Mark
Approved incidental fees: Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.

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Room: 4H02
Acknowledgement of Country
We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus

Introduction
Welcome to Geophysical Data Analysis 102. This unit is designed to equip students with the basic computing and numerical analysis skills required for geophysical data analysis.

Learning Outcomes
On successful completion of this unit students can:

| 1 | Explain the organisation, representation and conversion of data in a computer |
| 2 | Apply the basic logic of computing when designing algorithms |
| 3 | Explain how computing systems and programs are organised |
| 4 | Write programs which do simple tasks in numerical analysis |

Curtin's Graduate Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply discipline knowledge</td>
<td>Thinking skills (use analytical skills to solve problems)</td>
</tr>
<tr>
<td>Communication skills</td>
<td>Technology skills</td>
</tr>
<tr>
<td>International perspective (value the perspectives of others)</td>
<td>Cultural understanding (value the perspectives of others)</td>
</tr>
<tr>
<td>Information skills (confidence to investigate new ideas)</td>
<td>Learning how to learn (apply principles learnt to new situations) (confidence to tackle unfamiliar problems)</td>
</tr>
<tr>
<td>Professional Skills (work independently and as a team) (plan own work)</td>
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</tr>
</tbody>
</table>

Find out more about Curtin's Graduate attributes at the Office of Teaching & Learning website: otl.curtin.edu.au

Learning Activities
Theory: overview of computing; programming in MATLAB; program structures; internal representation of numbers and programs in computers, logical basis of computing; numerical methods for data analysis; techniques for numerical analysis and programming.

Laboratories: introduction to MATLAB. Use of programming for numerical and data analysis.

Learning Resources
Recommended Texts
You do not have to purchase the following textbooks but you may like to refer to them.

- Moore, H., 2010, MATLAB for Engineers: Pearson Education
- Hahn, B. and D. Valentine, 2011, Essential MATLAB for Engineers and Scientists: Elsevier
Assessment

Assessment Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value %</th>
<th>Date Due</th>
<th>Unit Learning Outcome(s) Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Laboratory Reports</td>
<td>50 percent</td>
<td>TBA</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>2 End of Semester Examination</td>
<td>50 percent</td>
<td>TBA</td>
<td>1,2,3,4</td>
</tr>
</tbody>
</table>

Detailed information on assessment tasks

1. Laboratory reports will be in the form of a saved ***.m file for each laboratory. The file will be an executable set of instructions interspersed with comment and description of the intention and purpose of the instructions.
   The marking of the report will be based on
   1. The successful completion of the laboratory work - 50%
   2. The correctness and programming style for labs which require programming - 10%
   3. The clarity of the comments on the instructions - 10%
   4. The proper labeling of diagrams - 10%
   5. The explanation of what the diagrams show - 10%
   6. The general presentation - 10%
   The report must have a header which contains information about you such as name and must also contain comments on the laboratory’s objective.
   The reports should not repeat what is given out in laboratory notes and should be all your own work. These should be presented as an ***.m file with comment lines starting with a percent sign (%) so that those lines are not executable.
   It is expected that all laboratory work will be completed by the time examinations start. Laboratory work will be assessed on the final ten (10) laboratories. The introductory laboratory will not count but will be marked and returned so that you can improve your presentations for later laboratories.

2. The end of semester examination will consist of multiple questions. The exact format will be confirmed at a later date.

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

Late Assessment Policy

This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments which students are required to submit will have a due date and time specified on the Unit Outline.
2. Accepting late submission of assignments or other work will be determined by the unit coordinator or Head of School and will be specified on the Unit Outline.
3. If late submission of assignments or other work is not accepted, students will receive a penalty of 100% after the due date and time i.e. a zero mark for the late assessment.
4. If late submission of assignments or other work is accepted, students will be penalised by ten percent per calendar day for a late assessment submission (e.g. a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assignment worth 20 will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and marked as 12/20, the student would receive 6/20. An assessment more than seven calendar days overdue will not be marked. Work submitted after this time (due date plus seven days) may result in a Fail - Incomplete (F-IN) grade being awarded for the unit.
Pass requirements

The first laboratory report will not be marked. The subsequent reports will be marked based on the following criteria:

- The successful completion of the laboratory work 50%
- The correctness and programming style for labs which require programming 10%
- The clarity of the comments on the instructions 10%
- The proper labeling of diagrams 10%
- The explanation of what the diagrams show 10%
- The general presentation 10%

Each of the ten marked reports is worth 5% of the final mark. The end of the semester examination is worth the remaining 50%. The student can pass the unit only if he or she obtains at least 40% of the end of the semester examination and more than 50% of the final combined score.

Referencing style

Students should use the Chicago referencing style when preparing assignments.

More information can be found on this style from the Library web site: library.curtin.edu.au.

Plagiarism

Plagiarism occurs when work or property of another person is presented as one's own, without appropriate acknowledgement or referencing. Plagiarism is a serious offence. For more information refer to academicintegrity.curtin.edu.au.

Plagiarism Monitoring

Work submitted may be subjected to a plagiarism detection process, which may include the use of systems such as ‘Turnitin’. For further information, see academicintegrity.curtin.edu.au/students/turnitin.cfm.

Additional information

When preparing assignments students should use the The Department of Exploration Geophysics referencing style which is the style of the SEG (Society of Exploration Geophysicists).

More information on this referencing style can be obtained at http://www.seg.org/resources/publications/geophysics/instructionstoa#manuscriptpreparation

Enrolment:

It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Supplementary/Deferred Exams:

Supplementary and deferred examinations will be held at a date to be advised. Notification to students will be made after the Board of Examiners meeting via the Official Communications Channel (OCC) in OASIS. It is the student's responsibility to check their OASIS account on a weekly basis for official Curtin correspondence. If your results show that you have been awarded a supplementary or deferred exam you should immediately check your OASIS email for details.

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Student Rights and Responsibilities

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University’s Guiding Ethical Principles
- the University’s policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University’s policies on appropriate use of software and computer facilities

Information on all these things is available through the University’s "Student Rights and Responsibilities website at: students.curtin.edu.au/rights.

Disability

Students with a disability or medical condition (e.g. mental health condition, chronic illness, physical or sensory disability, learning disability) are encouraged to seek advice from Disability Services www.disability.curtin.edu.au. A Disability Advisor will work with you and liaise with staff to identify strategies to assist you to meet unit (including fieldwork education) and course requirements, where possible. It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances.

Recent unit changes

We welcome feedback as one way to keep improving this unit. Students are encouraged to provide unit feedback through eVALUate, Curtin’s online student feedback system (see evaluate.curtin.edu.au/info/). Recent changes to this unit include:

Update of all lectures and some lab instructions.

See evaluate.curtin.edu.au to find out when you can eVALUate this unit.
## Program calendar

**Program Calendar – Semester 1 2013**

<table>
<thead>
<tr>
<th>Week</th>
<th>Begin Date</th>
<th>Lecture Topic 1</th>
<th>Lecture Topic 2</th>
<th>Lab Report Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>25 February</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>4 March</td>
<td>Computing &amp; Programming</td>
<td>Basic use of MATLAB Vectors, Matrices Solution of Linear equations</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>11 March</td>
<td>Computing &amp; Programming</td>
<td>Basic Plotting</td>
<td>20 March</td>
</tr>
<tr>
<td>3.</td>
<td>18 March</td>
<td>Computing &amp; Programming</td>
<td>Least Square Fitting of Data</td>
<td>27 March</td>
</tr>
<tr>
<td>4.</td>
<td>25 March</td>
<td>Computing &amp; Programming</td>
<td>Statistical Parameters of Data</td>
<td>3 April</td>
</tr>
<tr>
<td>5.</td>
<td>1 April</td>
<td>Tuition Free Week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>8 April</td>
<td>Computing &amp; Programming</td>
<td>Random Numbers</td>
<td>17 April</td>
</tr>
<tr>
<td>7.</td>
<td>15 April</td>
<td>Computing &amp; Programming</td>
<td>Interpolation Methods</td>
<td>1 April</td>
</tr>
<tr>
<td>8.</td>
<td>22 April</td>
<td>Tuition Free Week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>29 April</td>
<td>Computing &amp; Programming</td>
<td>Numerical Integration</td>
<td>8 May</td>
</tr>
<tr>
<td>10.</td>
<td>6 May</td>
<td>Computing &amp; Programming</td>
<td>Solutions of Equations</td>
<td>15 May</td>
</tr>
<tr>
<td>11.</td>
<td>13 May</td>
<td>Computing &amp; Programming</td>
<td>Extrapolation of Data</td>
<td>22 May</td>
</tr>
<tr>
<td>12.</td>
<td>20 May</td>
<td>Computing &amp; Programming</td>
<td>Relaxation Methods</td>
<td>29 May</td>
</tr>
<tr>
<td>13.</td>
<td>27 May</td>
<td>Computing &amp; Programming</td>
<td>3D Plotting and Visualization</td>
<td>5 June</td>
</tr>
<tr>
<td>14.</td>
<td>3 June</td>
<td>Review and Revision</td>
<td>Review and Revision</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>10 June</td>
<td>Study Week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>17 June</td>
<td>Examinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>24 June</td>
<td>Examinations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>