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Course staff

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Timetable

Lectures

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>10:00 – 12:00</td>
<td>Michael Hintze Theatre, Bldg H6</td>
</tr>
<tr>
<td>Thursday</td>
<td>09:00 – 11:00</td>
<td>Chemical Sciences M11</td>
</tr>
</tbody>
</table>
Your Course at a Glance

<table>
<thead>
<tr>
<th>What you will learn</th>
<th>Weeks</th>
<th>Assessment task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Philosophy of a composite</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2 Reinforcement and matrix materials.</td>
<td>1-2</td>
<td></td>
</tr>
<tr>
<td>3 Nanocomposites</td>
<td>2</td>
<td>Assignment</td>
</tr>
<tr>
<td>3 Mechanical behaviour of composites</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>4 Physico-chemical characterisation</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5 Fabrication techniques</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6 Design of composites</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7 Composite applications</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Assignment due Week 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Introduction to semiconductor devices</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>9 Theories of semiconducting behaviour</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Midsession exam Week 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Methods of single crystal growth and purification</td>
<td>7</td>
<td>Assignment</td>
</tr>
<tr>
<td>11 Lithographic methods</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>12 Fundamentals of Dielectrics</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>13 Introduction to Ferroelectrics</td>
<td>10-11</td>
<td></td>
</tr>
<tr>
<td>14 Applications of ferroelectrics in nanoelectronic devices and components.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Assignment due Week 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final exam</td>
<td></td>
<td></td>
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</tbody>
</table>

Course Objectives

The objective of this course is to develop a sound understanding in the relationships between structure, processing and properties of composite materials and also of a range of electronic device materials.
Course Outline


Assessment

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assignment 1</strong>: You will undertake a group task involving the application of the topics covered in Weeks 1-5. The task will involve submission of a group report. You will be asked to rate the performance of your group members and this will moderate your individual mark for your group assignment by ± 30%</td>
<td>15%</td>
</tr>
<tr>
<td>Due: Week 6</td>
<td></td>
</tr>
</tbody>
</table>

| Midsession Quiz: This examination will be the final examination for the topics learnt in Weeks 1-6 | 35%      |
| Held: Week 8                                                                   |          |

| **Assignment 2**: You will undertake a task involving the application of the topics covered in Weeks 7-12 | 15%      |
| Due: Week 12                                                                   |          |

| **Final Exam**: The final exam will assess your learning of the topics covered in Weeks 7-12. It will be 1½ hrs in duration and will be held during the final exam period. | 35%      |

References

**Composite Materials**

• Composite Airframe Structures, M.C-Y Niu, Conmilit Press, Hong Kong, 1992

Functional Materials
• Processing of Semiconductors, ed. K.A. Jackson et al. VCH, 1996.
• The Science and Engineering of Microelectronic Fabrication, S. A. Campbell, OUP, 1996.

Learning and teaching philosophy underpinning the course
Based on UNSW Learning Guidelines

The course is designed for students to actively engage in the learning process and analyse and synthesise the content in a real world environment.

• **Students are engaged actively in the learning process.**
  It is expected that, in addition to attending classes, students will read, write, discuss, and engage in analysing the course content.

• **Effective learning is supported by a climate of inquiry, where students feel appropriately challenged.**
  Students are expected to be challenged by the course content and to challenge their own preconceptions, knowledge, and understanding by questioning information, concepts, and approaches during class and study.
• Learning is more effective when students’ prior experience and knowledge are recognised and built on. Coursework, tutorials, assignments, laboratories, examinations, and other forms of learning and assessment are intended to provide students with the opportunity to cross-reference these activities in a meaningful way with their own experience and knowledge.

• Students become more engaged in the learning process if they can see the relevance of their studies to professional and disciplinary contexts. The course content is designed to incorporate both theoretical and practical concepts, where the latter is intended to be applicable to real-world situations and contexts.

Course Information

<table>
<thead>
<tr>
<th>Units of credit</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>How the course relates to other course offerings and overall program(s) in the discipline</td>
<td>The course is built on prior courses in mathematics, mechanical behaviour, polymers, phase equilibria, physical metallurgy, microscopy and crystallography.</td>
</tr>
</tbody>
</table>
| Graduate attributes which will be gained through the course | • Ability to communicate effectively  
• Capacity for creativity and innovation  
• Ability to manage information and documentation  
• Ability to function effectively as an individual  
• Ability to work effectively in multidisciplinary and multicultural teams  
• Capacity for lifelong learning and professional development  
• Professional attitudes |

| Expected learning outcomes | In doing this course, you will learn to:  
• Describe relationships between materials structures, properties and processes  
• Make informed decisions in materials selection for engineering design  
You will also learn to:  
• Think critically in decision making and problem-solving  
• Communicate with correct terminology  
• Conduct online research |

| Teaching strategies | • Core concepts, theories and approaches to solving problems in composites and device materials to be covered in lectures. Examples will be provided to demonstrate these principles in materials science and engineering.  
• It is expected that students attending classes are prepared for discussion.  
• An on-line group project will be provided to give you the opportunity to synthesise the course content. The group project will provide a part of your assessment.  
• Teaching material, including the course outline, assignments, examples of solutions of problems, and course announcements are available the Course Blackboard website. |

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1Based on the professional attributes given in Engineers Australia National Generic Competency Standards - Stage 1 Competency Standard for Professional Engineers and UNSW Graduate Attributes.
Academic honesty and plagiarism

What is Plagiarism?
Plagiarism is the presentation of the thoughts or work of another as one’s own.* Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person’s assignment without appropriate acknowledgement;
- paraphrasing another person’s work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

www.lc.unsw.edu.au/plagiarism

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students 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 items.

* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle
† Adapted with kind permission from the University of Melbourne.

Continual course improvement

- Students will be asked to provide evaluative feedback through the UNSW's Course and Teaching Evaluation and Improvement (CATEI) process at the end of the course
- Students are encouraged to address any problems regarding teaching of this course at the annual staff-student meeting
• Student comments on teaching during the session are welcome and will be appreciated.

At times students may be asked to answer a short questionnaire for feedback on the course.

**Administrative Matters**

• Students should attend at least 80% of all classes.

• Students unable to submit assignments on time or attend the mid-session quizzes or final exams on health grounds should make a request for special consideration. Information on this process can be found here (https://my.unsw.edu.au/student/atoz/SpecialConsideration.html). Medical certificates or other appropriate documents must be included. Students should also advise the lecturer of the situation.

• Assignments/lab reports submitted after the deadline will receive a 10% of maximum grade penalty for every day late, or part thereof.

• Students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course coordinator prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (www.studentequity.unsw.edu.au). Early notification is essential to enable any necessary adjustments to be made.

**Rules for Exams**

Rules governing conduct during exams are given at: https://my.unsw.edu.au/student/academiclife/assessment/examinations/examinationrules.html - Rulesfortheconductofexaminations

Note that the use of mobile phones or music players in an exam room will constitute Academic Misconduct.