Welcome to the Honours program in the School of Chemical and Physical Sciences (CaPS). The Honours program consists of a full year of study commencing on February 2nd and concluding in late November.

The work is divided into three components, two of which (coursework and research project) are formally assessed, and a third component, consisting of reading, seminars etc.

Every student is required to participate satisfactorily in all sections of all components of the honours program as described below.

INTRODUCTORY ACTIVITIES

There are a number of activities detailed on the next page in the Honours Introduction Schedule of Events in which attendance is compulsory. They are designed to introduce you to the Honours year as well as to equip you with necessary background skills important for a successful Honours completion. It is also important that you attend the following sessions (please note that ALL sessions are compulsory).

1. **Laboratory Demonstrator Training** (Compulsory) [Not in the introductory week] Friday, 27th February, 9:30 am to 4:00pm, Room 306 - 309, Health Science Lecture Theatre Building

   You will need to enrol with the Centre for University Teaching using the following link:


2. **Instrument Training** (will be scheduled in late March)
   a) Atomic Force/Scanning Tunnelling Microscopy (Dr Chris Gibson ext:17978)
   b) GCMS, HPLC, Ion Chromatography, FTIR (Mr David Vincent ext:12116)
   c) 400MHz Bruker NMR (Assoc. Prof Martin Johnston ext:12317)

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1 Masters of Nanotechnology students, in their 2nd year, follow the same program as Honours students
<table>
<thead>
<tr>
<th>Date</th>
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<th>Event</th>
<th>Speaker</th>
<th>Room</th>
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<tr>
<td>Monday 2nd February</td>
<td>10:00 - 11:00 am</td>
<td>Introductory Lecture</td>
<td>Dr Boris Blankleider</td>
<td>PHYS 201</td>
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<tr>
<td></td>
<td>11:00 - 12:00 pm</td>
<td>What is Research? <em>(CPES7701)</em></td>
<td>Dr Boris Blankleider</td>
<td>PHYS 201</td>
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<tr>
<td></td>
<td>12:00 - 1:00 pm</td>
<td>IT Induction</td>
<td>Fred Pamula</td>
<td>PHYS 201</td>
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<td></td>
<td>2:00 - 3:00 pm</td>
<td>OHS Basics – Why this is important? <em>(CPES7701)</em></td>
<td>David Vincent</td>
<td>PHYS 201</td>
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<tr>
<td></td>
<td>3:00 - 4:00 pm</td>
<td>School Services Tour</td>
<td>David Vincent</td>
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<tr>
<td>Tuesday 3rd February</td>
<td>9:00 - 12:30 pm</td>
<td>Fire Training</td>
<td>Bob May</td>
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<td>2:00 - 3:00 pm</td>
<td>Basic Discussion of Ethics – example of consequences <em>(CPES7701)</em></td>
<td>Professor Michael Brunger</td>
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<tr>
<td>Wednesday 4th February</td>
<td>9:30 – 10:30 am</td>
<td>Discussion on Project Management <em>(CPES7701)</em></td>
<td>Professor David Lewis</td>
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<td></td>
<td>12:00 - 1:00 pm</td>
<td>Electrical Safety and Gas Cylinder Handling</td>
<td>Bill Drury/Bob Northeast</td>
<td>PHYS 201</td>
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<tr>
<td></td>
<td>2:00 - 3:00 pm</td>
<td>Journal Searches</td>
<td>Library Liaison</td>
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<tr>
<td></td>
<td>3:00 - 4:00 pm</td>
<td>Library Tour Central</td>
<td>Library Liaison</td>
<td>Central Library</td>
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<tr>
<td>Tuesday 10th February</td>
<td>11:00 – 1:00 pm</td>
<td>Scientific Communication <em>(CPES7701)</em></td>
<td>Professor Joe Shapter and Dr Ingo Koeper</td>
<td>PHYS 201</td>
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<tr>
<td></td>
<td>2:00 – 3:00 pm</td>
<td>Intellectual Property and its role in Research. <em>(CPES7701)</em></td>
<td>Mark Bruce (Flinders Partners)</td>
<td>PHYS 201</td>
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<tr>
<td>Tuesday 17th February</td>
<td>2:00 - 3:00 pm</td>
<td>OHS Basics – (cont’d) Workplace Substances <em>(CPES7701)</em></td>
<td>David Vincent</td>
<td>PHYS 2105</td>
</tr>
<tr>
<td>Friday 20th February</td>
<td>9:30 – 11:30 pm</td>
<td>OHS Basics – (cont’d) Practical Laboratory WHS <em>(CPES7701)</em></td>
<td>David Vincent</td>
<td>PHYS 201</td>
</tr>
<tr>
<td>Tuesday 24th February</td>
<td>2:00 - 4:00 pm</td>
<td>OHS Basics – (cont’d) Plant Risk Assessment <em>(CPES7701)</em></td>
<td>David Vincent</td>
<td>PHYS 2105</td>
</tr>
<tr>
<td>Wednesday 25th February</td>
<td>10:00 - 11:00 am</td>
<td>Research Proposal <em>(CPES7701)</em></td>
<td>Professor Joe Shaper</td>
<td>TBA</td>
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<td></td>
<td>1:00 – 3:00 pm</td>
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<td>Professor Amanda Ellis</td>
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<td></td>
<td></td>
<td></td>
<td>Professor David Lewis</td>
<td></td>
</tr>
<tr>
<td>Friday 27th February</td>
<td>9:30 – 4:00 pm</td>
<td>Science &amp; Engineering Demonstrator Training</td>
<td>Lisa Schmidt</td>
<td>Rm 306 - 309 Health Science</td>
</tr>
</tbody>
</table>
ASSESSABLE COMPONENTS

All textual material submitted for assessment, except in written examinations, is expected to be produced on a word processor.

Coursework

The coursework consists of 3 compulsory topics:

**CPES 7701** Advanced Research Skills (4.5 units)

**CPES 7711** Advanced Techniques in Chemical and Physical Sciences (4.5 units)

**CPES 7721** Advanced Techniques in Chemical and Physical Sciences (4.5 units)

All three topics are held from 3rd February through to 27th June, with CPES 7701 repeated, specifically for mid-year entry students, from 27th July through to 30th November.

The topic details are as follows:

**CPES 7701** Advanced Research Skills (4.5 units)

The aim of this topic is to introduce students to the basic set of practical skills needed for carrying out scientific research in a safe and successful manner. The topic delivery will be via a series of compulsory lectures and demonstrations, as indicated in the Honours Introduction Schedule of Events, above. Some of the areas covered will include: ethics, safety, risk assessment, surveys of scientific literature, project proposal, project management, intellectual property, scientific writing and verbal presentation skills. In addition, each student will use the research project assigned by his or her Honours Supervisor as the subject of a Research Proposal consisting of the following three components:
1) A 5 page written proposal to be submitted electronically (PDF File) to the School Office c/o caps.office@flinders.edu.au this will then be forwarded to your supervisor and members of your viva panel. This panel will be assigned before the viva.

2) A 10 minute presentation on your proposal to be timetabled for before the end of April (in the second semester break for the Mid-Year Entry).

3) A Viva with a committee of three plus the student supervisor will take place immediately after your presentation. This same committee will be the viva committee for that student at the end of the year.

The essay should be a maximum of 5 pages in length, including the references. The student must demonstrate the ability to complete a survey of the specific literature in the area of his/her Honours project. The intention of the essay is to develop the method of collating and critically analysing published work, as well as the ability to write English in an unambiguous scientific manner. Further, this assignment aims to test whether the student can formulate a research hypothesis, and then design a logical series of experiments to test it.

<table>
<thead>
<tr>
<th>Assessment of CPES 7701</th>
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<tbody>
<tr>
<td>Ethics Discussion Paper</td>
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<tr>
<td>Written Risk Assessment</td>
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<tr>
<td>Critiqued Scientific Paper</td>
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<tr>
<td>Research Proposal (5 pages)</td>
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<tr>
<td>Research Proposal Presentation</td>
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<tr>
<td>Research Proposal Viva</td>
</tr>
</tbody>
</table>

**CPES 7711** Advanced Techniques in Chemical and Physical Sciences  (4.5 units)

**CPES 7721** Advanced Techniques in Chemical and Physical Sciences  (4.5 units)

Each of the topics CPES 7711 and CPES 7721 consists of three 1.5 unit modules which need to be chosen from the list of offered modules whose description can be found at the end of this Handbook. Your choice must be consistent with the Program of study for your Degree – see [http://www.flinders.edu.au:80/courses/rules/honours.cfm](http://www.flinders.edu.au:80/courses/rules/honours.cfm), and must be done in consultation with your supervisor (your supervisor must approve your choice of topics). For information regarding Examinations and/or other forms of assessment, please consult the topic lecturer.

Unless specific acknowledgment is made, the submission of written work for assessment is taken to mean that the material is your own work.

Please note that the costs of photocopying of coursework material are your responsibility.
Research Project

In conducting research, students are responsible to the supervisor to whom they have been assigned. The level of experimental and theoretical activities associated with the research project should decrease from early October with the expectation that all such work will have ceased by mid-October (End of May for Mid-Year Entry). Students are expected to submit a thesis discussing the research project.

Students should hand in all materials prepared during the year, adequately labelled, together with all relevant experimental data, spectroscopic data, computer programs and disks, laboratory notebooks and photocopied material pertaining to the research project. Laboratory benches and general work areas including office space must be left clean and tidy.

In addition to the mark provided by your supervisor, there are four components to the assessment of the research project, see below. These assessment vehicles enable you to show your understanding of your research project and provide opportunities for you to communicate the results to others in a variety of media.

1. Seminar

A formal seminar on the research project is required to be presented in early November. Generally this is scheduled about eight days before the deadline for the submission of the thesis. This seminar is presented to the entire school, and consists of a 20 - 25 minute presentation on your Honours project, with an additional 5 minutes allocated to questions from the audience.

Given the varied background of the audience, the presentation must be at a level that a well-informed non-expert scientist can understand.

2. Thesis

A thesis discussing the research project must be submitted for assessment to the School Office.

Layout

- The thesis should be as brief as is compatible with proper explanation of the research project. The maximum length of the thesis is 40 pages (page count starting with the Introduction and ending with the references). Note that appendices are not part of the assessable work and may or may not be read by the members of the viva panel. Note: Penalties of one mark per page will be applied for each page over 40 pages.

- The thesis should be written using a word processor with the following settings:
  - A4 Paper
  - 12pt font
  - 1½ line spacing
  - Margins of at least 1.5cm with a larger left margin (to allow binding of a printed version)
- The thesis must include the following:
  a) A title page.
b) A declaration page stating that work presented in the thesis is the author’s original work unless it is referenced.
c) A brief index (pages of the thesis must be numbered).
d) A summary.
e) An introduction including a literature review.
f) (i) Experimental details and/or theoretical methods
   (ii) Results
   (iii) Discussion
   (iv) Conclusions
g) Appendices
h) References

- The introduction should describe the background to the project, the motivation for the research work, and what is to be achieved. This section should be based on a thorough literature review.

- The sections under (f) may be in separate chapters and may be in a different order. Different projects lend themselves to different styles of presentation, *e.g.* a thesis for a synthetic project may have results and discussion combined and these may precede the experimental section. Take advice from your supervisor about the best order of presentation. The conclusion should state the aims that have been achieved and the direction in which the research should proceed next.

- All Figures and Tables should be numbered and be referred to in the text by these numbers. They should all have captions that are sufficiently informative so that a reader can interpret the main features of the figure or table without reference to the text.

- Graphs must be computer generated and have axes labelled with scales and units given.

- References: The thesis should have a complete set of references to relevant work in the field. There are two acceptable ways of citing references in the thesis:
   a) By numbers which are in either superscript mode or between square brackets and a corresponding list at the back of the thesis in numerical order. This is used in most Chemistry, Physics journals *e.g.* Journal of the Chemical Society and the Physical Review
   b) The Harvard system used in biological, mineralogical and crystallographic journals. It takes up a little more space but has the advantage of showing the reader immediately the names of authors and date of the reference, and the reference list is in alphabetical order (easy to add to if needed). For examples, see Acta Crystallographica, Sections B or D or Water Resources Research, Ground Water, Hydrogeology Journal. Use abbreviations as they appear in these journals.

*Supervisor input*

- Your supervisor may read and criticise a draft of the introduction, experimental and theoretical results sections of your thesis. Following this there will be no editorial input from your supervisor. This does not mean that you cannot continue to discuss the content of the thesis with your supervisor.
• The writing of the discussion and conclusion section must be solely your own work.

Acknowledgments

• All assistance with writing and the production of the thesis must be acknowledged. It is usually sufficient to acknowledge this in a statement at the front of the thesis. Help from the supervisor and other members of staff is usually mentioned here.

• If you make use of substantial scientific information that has been given to you verbally or otherwise, by a person other than your supervisor, you should acknowledge this as a personal communication at the appropriate point in the text as a reference.

Submission time

• An electronic copy (PDF File) is to be submitted to the School Office c/o caps.office@flinders.edu.au by 12:00 noon, Wednesday, November 11th, 2015 (for mid-year entry: 12:00 noon, Wednesday, June 22nd, 2016). This deadline must be strictly observed.

• It will take you longer to write and produce the thesis than you expect. You must start this process in time to finish.

• To avoid the consequences of the breakdown of computing equipment have your thesis finished at least 24 hours ahead of the deadline.

• Penalties will be applied if the thesis is late
  5 % for one day late (any time after 12pm is late)
  20 % for two days late
  50 % for three days late

Poster

There will be a poster presentation involving all members of the school. These posters should be handed into the School Office. During the presentation each student will have the opportunity to explain his/her poster to anyone interested in the results of the thesis.

Aims of the poster:
• To enable students to gain experience in presenting their research work in poster form. This is now a common way of transmitting information at scientific and other meetings and in the workplace.

• To provide material for a visual display that will inform undergraduates and visitors to the School of the kinds of research activities in which senior students and staff are involved.

Content

• The material should be presented at a level that will be informative to an interested layperson.

• The amount of material should be such that it can be assimilated in 4 to 5 minutes.

• There should be a title followed by the names of student and supervisor.
• As a rough guide, about half of the poster should be taken up with an outline of the background and reasons for doing the work and the most significant results presented in the remainder. Liberal use of figures or graphs is encouraged. Tabulated data is probably not very useful in most cases.

• One or two major references can be included, but they are not essential.

**Materials and design**

• The poster should consist of a single sheet of A1 sized paper. Material for the poster should be prepared initially on A4 paper. These sheets can then be enlarged if desired and arranged on the backing sheet.

• The design of the poster is left to the student and should be as eye-catching as possible. Portrait mode is preferred, because there are more display cases suitable for this orientation.

• Type size must be large enough to be read from a reasonable distance. *Minimum* font sizes for the text are 20pt if it is not to be enlarged and 14pt if it is to be enlarged to 141%. Title and "by line" should be 72pt and 48pt (actual) or 48pt and 36pt enlarged to 141%, respectively. Other combinations and enlargement factors may be satisfactory. Examples are in the School Office. Sans serif font styles (e.g. Arial) are somewhat clearer and easier to read from a distance.

**Deadline**

• The poster should be handed in to the School Office by 12:00 noon, Monday, November 16<sup>th</sup>, 2015 (for mid-year entry: 12:00 noon, Monday, June 27<sup>th</sup>, 2016).

**Awards**

• Prizes may be awarded for the best posters. They will be presented at end of year School Dinner which staff and Honours and Postgraduate students of the School attend.

### 3. **Viva Voce Examination**

This is held after the thesis has been submitted and the poster session.

- A panel consisting of the student's supervisor(s) and academic staff who have examined the thesis will conduct a *viva voce* examination lasting about 30 minutes.
- The examination will be centred around the thesis but may extend into related areas.

**ASSESSMENT**

The marking scheme for determining the final grade of Honours is:

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<th>Honours Grade</th>
<th>Final Mark</th>
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<tr>
<td>Class H1</td>
<td>85 - 100</td>
</tr>
<tr>
<td>Class H2A</td>
<td>75 - 84</td>
</tr>
<tr>
<td>Class H2B</td>
<td>65 - 74</td>
</tr>
<tr>
<td>Class H3</td>
<td>50 – 64</td>
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</tbody>
</table>

where your final mark is derived as follows:
Final Mark = Coursework Mark × 0.33 + Research Project Mark × 0.67

Coursework Mark: is the average mark for the three coursework topics (13.5 units in total)
Research Project Mark: is determined from the following components:

- Supervisor's Assessment based on performance during the year (30%)
- Final Seminar on Thesis and Poster (10%)
  [marks given by all academic staff who attend the seminar and poster session, and viva panel, for the proposal]
- Thesis - content, presentation, readability etc. (30%)
  [single mark allocated by the three viva examining panel not including the supervisor]
- Viva voce examination (30%)
  [single mark allocated by the three viva examining panel not including the supervisor]

NB.
While marks are accumulated according to the above scheme, you should note that to be awarded a particular class of honours you are normally expected to have performed at that level in both course-work and project, ie there should be a consistency in performance across these two areas.

The assessment during the honours year is independent of results obtained in the Ordinary Degree. Any class of honours is, in principle, accessible to any student. There is no 'quota' for any class of honours.

The criteria for assessment of Honours will include:
- Originality and creativity of thinking or performance
- Evidence of ability to undertake independent research
- Critical awareness of scholarship within the discipline
- Breadth and depth of understanding
- Comprehensiveness of treatment of subject material
- Capacity for achieving objectives
- Accuracy and clarity of presentation

The performance for each Honours classification should exhibit the following:

Honours First Class (H1)
Sustained excellence in quality of written, oral and, where relevant, performative work, judged against stated criteria. This level of achievement should be rated as outstanding in the sense that students clearly demonstrate advanced scholarship within the discipline and a high level of ability to undertake independent research. A score in the range of 85 to 100 will be awarded.
Honours Second Class (H2A)

An overall high level of scholarship judged against stated criteria, which may include excellence in some areas. Students achieving this classification will have demonstrated the ability to undertake independent research. A score in the range of 75 to 84 will be awarded.

Honours Second Class (H2B)

A substantial level of scholarship judged against stated criteria. While showing some variability in performance, students achieving this classification are assessed as competent within the discipline. A score in the range of 65 to 74 will be awarded.

Honours Third Class (H3)

A satisfactory level of scholarship judged against stated criteria. Students achieving this classification are seen as having met the minimum requirements for the award. A score in the range of 50 to 64 will be awarded.

Fail

An unsatisfactory level of scholarship judged against stated criteria. Students awarded this classification are seen as not having met the minimum requirements for the award. A score in the range of 0 to 49 will be awarded.

NON-ASSESSABLE COMPONENT
(Satisfactory participation is compulsory)

- Attendance at all seminars of the “School Wide Seminar Series for Chemistry and Physics”
- Attendance at all seminars in the general topic of your thesis
- Attendance at research group meetings and presentation of seminars as required by supervisors.
- Participation in Introductory Activities.
HONOURS SCHEDULE 2015 – February Entry

Starting Date: Monday, February 2\textsuperscript{nd}, 2015
Coursework Start / End: Tuesday, February 3\textsuperscript{rd} / Friday June 26\textsuperscript{th}, 2014
CPES7711 Research proposal:
  Due Date: Tuesday, April 7\textsuperscript{th} 2015
  10 minute proposal presentation: Wednesday, 15\textsuperscript{th} and Thursday 16\textsuperscript{th}, April 2015
  Viva assessment: Same day as presentation.
Finish of Experimental Work: Friday, October 2\textsuperscript{nd}, 2015
Honours Research Seminar: Tuesday November 3\textsuperscript{rd}, 2015
Thesis Submission to the School Office: 12:00 pm, Wednesday, November 11\textsuperscript{th}, 2015
Poster Submission to the School Office: 12:00 noon, Monday, November 16\textsuperscript{th}, 2015
Poster display: 2:00 pm, Tuesday, November 17\textsuperscript{th}, 2015
Viva Voce Examinations: Thursday November 19\textsuperscript{th}, 2015

HONOURS SCHEDULE 2015– Mid Year Entry

Starting Date: Monday, July 27\textsuperscript{th}, 2015 (start of 2\textsuperscript{nd} semester)
CPES7711 Research proposal:
  Due Date: Tuesday, September 15\textsuperscript{th}, 2015
  10 minute proposal presentation: Wednesday 23\textsuperscript{rd} Sept, 2015
  Viva assessment: Same day as presentation.
Coursework Start / End: Monday, February 1\textsuperscript{st} / Friday, June 24\textsuperscript{th} 2016
Finish of Experimental Work: Friday, May 13\textsuperscript{th}, 2016
Honours Research Seminar: Tuesday, June 14\textsuperscript{th}, 2016
Thesis Submission to the School Office: 12:00 pm, Wednesday, June 22\textsuperscript{nd}, 2016
Poster Submission to the School Office: 12:00 noon, Monday, June 27\textsuperscript{th}, 2016
Poster display: 2:00 pm, Tuesday, June 28\textsuperscript{th}, 2016
Viva Voce Examinations: Thursday, June 30\textsuperscript{th}, 2016

Attendance
Most supervisors expect honours students to be on campus during office hours. Please note that there is an expectation that students will not be absent from the department for study purposes, during usual office hours, more than 2 days per exam. There are no mid-semester and semester breaks in the honours year.
CaPS LABORATORY DEMONSTRATOR
TRAINING DAY

Friday FEBRUARY 27th 2015

9:30 am – 4:00 pm

Room 306 - 309, Health Science Theatre Building

The Centre for University Teaching is offering this FREE session
This workshop is mandatory for all new demonstrators in CaPS.

The workshop will help you understand how to organise and run laboratory sessions, as well as provide information on:

• Health & safety issues in the lab
• Preparing pre-lab talks
• Effective teaching methods
• Assessment and feedback to students
• Dealing with difficult situations
• How to gain some benefits for your career from participating in demonstrating/tutoring

+ FREE LUNCH!!

Please enrol using the following link:
INFORMATION FOR NEW STAFF/STUDENTS

Welcome to the School of Chemical and Physical Sciences. The following information has been compiled to assist in your transition as a new member within the School. If you have any further queries, please contact the School administration staff:

THE ATTACHED CHECKLIST AND FORMS MUST BE COMPLETED AND RETURNED TO THE SCHOOL OFFICE.

After Hours Building Access
The external doors of the Physical Sciences building are open from 8.15 am – 5.15 pm, Mon-Fri. If you require after-hours access, this will be arranged following completion of the Building/Laboratory Card Access Request Form available on the school website at [http://www.flinders.edu.au/science_engineering/caps/information/members/forms.cfm](http://www.flinders.edu.au/science_engineering/caps/information/members/forms.cfm). The form needs to be authorized by the responsible officer, generally your supervisor or the Manager, School Administration.

Computers
Computer access is enabled following completion of the CaPS Network Account Request form attached from the school office. When you first log on to one of the School’s computers, you will need to enter your FAN details (refer to the relevant section below). If you encounter any problems, please contact the Computer Services Unit – extension 13787, room 2023 physical sciences building, email csu@flinders.edu.au.

Your use of Computing Resources (including Internet / network) within the School of Chemical and Physical Sciences is dependent on complying with the rules and regulations defined by the University’s policies and procedures: [http://www.flinders.edu.au/ppmanual/computing.html](http://www.flinders.edu.au/ppmanual/computing.html).

Network storage space is provided for the storage of files related to your studies / research / employment at the university. Any files not related to your studies or those deemed offensive or inappropriate may be removed.

The unauthorised operation or use of any item of equipment, networks or software is prohibited.

Unauthorised interference with any item of equipment or attempting to change, copy, or interfere with software, data or files which have been developed by another person is forbidden.

You should not divulge to any person your username and password as you will be held responsible for any misconduct that originates from your account.

You are not permitted to use any accounts other than the accounts explicitly given to you by the University. Using another person’s account will be treated as serious misconduct.

You are prohibited from violating any software license agreement such as by (i) installing software on any computer in the facility, (ii) copying any software from the facility or, (iii) copying files from the internet unless you are permitted to do so by Computer Services Unit. This includes the copying of files such as MP3/DVDs/CDs.

Using the University’s computer facilities to harass or threaten other users is not permitted.

Failure to comply with these regulations may result in the suspension of your account and possible disciplinary action.

When you leave the School computer network accounts are closed and data archived.

Copyright
Copying material from any source for which you have not been given explicit permission is a breach of copyright and is punishable by law.

Electrical Safety
The University has an electrical safety policy which states that no piece of electrical equipment can be plugged into a mains power outlet unless the equipment has been electrical safety tested. This includes computer hardware such as laptops.
Email
It is University policy that all email messages are sent to your Flinders University email address only. If you wish to forward your messages to a preferred email address, you will need to login to Email Utilities at: https://mail.flinders.edu.au/email/index.php and select ‘Forward your Email to a different Email address’.

Email is provided for your individual use on University related work. University network and computer facilities are available to you for the pursuit of legitimate University work and may not be used for commercial gain, private business interests, promulgation of personal ideologies and vendettas, chain letters, harassment or the like.

Gaining access to another user's electronic mailbox or reading another person's electronic mail without the user's permission is prohibited.

Your Flinders University email address will also be included on the relevant School email list to ensure that you receive pertinent messages within the School. The various group email lists that are currently in use for the School include all teaching academic staff, all post graduate students in the school, all honours students in the school, all general staff in the school, admin staff, all other staff not already covered in any of the previous lists, staff in all of the previous lists. Please contact Chris Brooks chris.brooks@flinders.edu.au if you require further information regarding the group email lists.

The student’s email address setup is the FAN followed by @flinders.edu.au
Staff members email setup is firstname.lastname@flinders.edu.au

Employee Self Service
Web based access to the payroll database to view/print payslip, leave bookings/balances, etc. To access this facility, e-mail: bppay@flinders.edu.au

FAN (Flinders Authentication Name)
The FAN is your username when logged into both the School & University computer network. It comprises the first 4 letters of your family name, followed by 4 numeric digits which are allocated by central administration. Your FAN must be activated prior to use by logging in with your initial password (see below).

**Staff** - The initial password for staff is the last four characters of your payroll number followed by four characters of your birth date in the form ddmn (day,day, month,month). For example a birthday of 7 March is represented by 0703, and a payroll number of 0000362 is represented as 0362. Together these generate a password of 03620703.

**Student** - The initial password for students is the last four characters of your student ID followed by four characters of your birth date in the form ddmn (day,day month,month). For example a birthday of 7 March is represented by 0703, and a student ID of 20001764 is represented as 1764. Together, these generate a password of 17640703. If you are also a staff member then your staff default password takes precedence.

Refer to the FAN instructions at the following website, and take note of the rules when creating a new password: https://www.flinders.edu.au/fan/

Email access before you appear on the Human Resources/Enrolment system can be arranged by completing the completing the Application for Use of University Email form available from the school office.

Fax Machine
A fax machines is located in the CaPS school office.

Field Trips
The safety rules regarding field trips and/or excursions must be observed. For each trip you must complete the Off Campus Travel form.

ID Card - Staff/ Student/ Visitor
Each staff/student/visitor is issued with a card for purposes of identification and after hours access to buildings. It is also a library card for the purpose of borrowing books from the University's collections and to purchase stock items from the Physical Sciences Store.

To obtain a staff card you will need to take your payroll number to the Multimedia Unit on Level 1 of the Central Library (telephone number is 12625). (If you are unable to provide your payroll number, your letter of appointment can be used so that the card can be issued without delay.) The Multimedia Unit is open from 9.00 am to 5.00 pm on weekdays. Your details will be checked and your ID photograph taken. Your staff card will be issued to you immediately.

If you are an unofficial visitor to the University you should contact the School Administration Manager, who will arrange for you to get a visitor's card.
Internet Usage
Access to the Internet is provided for your individual use on University related work. Viewing, downloading or storing material from the Internet that is not related to your studies / research / employment is prohibited. Internet access is monitored by the University.

Keys
You will need keys to access your office and laboratories. As there have been a large number of thefts around the School in recent years, we advise you to be security conscious and you are strongly urged to lock your offices and labs whenever they are unattended. You should note that the University does not have insurance for the loss or theft of personal items. The University’s insurance policy includes an excess of $5,000 for the loss or theft of University owned items. The excess is the responsibility of the grant holder or School depending on the funding source.

The keying system operates on a hierarchical basis, where area or discipline supervisors nominate and authorise key access to specified areas. Each key has a unique number that is stored in a central database. This enables keys and key holders to be identified and tracked. The Authority to Issue Key form attached available from the school office is used to record this information and should be authorised by the responsible person, usually the area supervisor. Once authorisation has been obtained, keys are issued from the school office. Staff/student/visitors who will be here for less than one year will be required to pay a refundable key deposit of $20.

Maps: Flinders University map & School map
A map of the University campus and a floor plan of the Physical Sciences building are available from the CaPS school office. The current University map can also be downloaded from http://www.flinders.edu.au/map/

Occupational Health & Safety
It is the responsibility of all staff and students to comply with the University’s Occupational Health and Safety policy and to become familiar with local implementation of that policy. All new staff and students must therefore undergo an OH&S Induction. The Technical Services & Safety Manager has been alerted to your arrival through the checklist form and will ensure that the induction is completed within the first few weeks of arrival. It is also University policy for all academic staff to complete the supervisors OH&S training on-line at http://www.flinders.edu.au/ehlt/ohs&sw/supervisor-training.cfm

Parking
Parking is by permit or daily ticket. Please refer to the permit options/costs/regulations at: http://www.flinders.edu.au/campus/location/parking.cfm – you may wish to take note of the information regarding Salary Sacrificing your parking fees. The closest car parks to the Physical Sciences building are 7 and 9.

Petty Cash
Small purchases (of not more than $50) may be reimbursed from petty cash if approved by a supervisor, and is administered via the school office.

Photocopiers/ Printers
Are available for the use of staff, postgraduate students and honours students. On your checklist form, you will have advised the school office of your desired 4-digit PIN. This will be keyed into the photocopier upon request. Physical Sciences Building: Black and white and colour printers and a colour photocopier/printer/scanner are located in the Physical Sciences photocopy room (room 300).

Pigeonholes
These are located in room 300 Physical Sciences Building. Staff have individual pigeonholes. Postgraduate and honours students share A-Z pigeonholes. Please ensure that you check your mail on a regular basis.

Research Material Storage
Research staff and students are asked to familiarise themselves with the University’s Policy on Research Practice which can be found at http://www.flinders.edu.au/ppmanual/research/resproc.htm

In particular your attention is drawn to section 6.4(iv) which states that “Each researcher will be responsible for maintaining research records, and ensuring that arrangements are made for his or her research data and records to be stored and referenced in accordance with this Policy”. When you leave the University, you are required to provide a statement to the Head of School about where in the University your data and records have been stored.

Secure Areas
Several areas of the School are either secured by swipe card access, pin code access or alarmed by motion sensors. In the latter case a pin code is required to disarm/activate the security systems. Contact the school office if you require access to secure areas.
Security
Security officers are available 24 hours/7 days per week via the hot-line telephone around campus or by calling 8201 2880. They also provide an after-hours escort service to cars or student accommodation, and can assist with minor car problems such as flat batteries or keys locked inside the car.

Staff Orientation-Central Administration
Please refer to the University’s staff orientation website at http://www.flinders.edu.au/staffdev/enrol/courses/newstaff.php

Store
The Physical Sciences store, room 3213 Physical Sciences building (near the building entrance from car park 9) is open from 9 am - 1 pm, and 2 pm - 4 pm Mon-Fri. To enable you to purchase goods from the store you must first lodge your checklist form at the School Office. Your ID card must be presented when purchasing goods, which are then charged to the relevant account.

Tricia Butterfield, the store manager (extn 12167) can assist with procedure.

Tea Room - Physical Sciences
Located in 3101, level 3, Physical Sciences building.

Tea/coffee charges are displayed in the tea rooms. Please contact the School office regarding payment.

Telephone Directory
The link to the University’s staff directory can be found from the top centre of the University’s home page at: http://www.flinders.edu.au/

For staff, postgraduate and Honours students, and long term visitors, the Telephone Directory Changes form available from the school office is used to record your details on the University telephone system and also to set up your voice mail if required. If you indicate that you require voice mail, Information Services Division will send you further information on how to initialise or reset the system.

Your status at the University will determine your level of access. Honours students are allowed local access only, but can upgrade to mobile phone and STD access with the approval of their supervisor. The supervisor will need to provide an account number for the additional charges.

Vehicle Hire
Arranged via the University’s Transport office, extension 12015. Booking forms are available in the school office. The cost of vehicle hire will be charged against your account.

Voicemail
To set up voicemail on your telephone extension, ring Information Services Division on 12345 (option 3). Please ensure that your voicemail is activated as soon as possible to capture all calls. If you share a phone with other staff, you must ensure that a greeting is recorded which lists the names of all subscribers to that extension.
Policy on Academic Integrity

PLEASE ENSURE THAT YOU ARE FAMILIAR WITH THE UNIVERSITY’S POLICY ON ACADEMIC INTEGRITY


1 Preamble

All students have an obligation to understand and respect the rules and practice of academic integrity. It is therefore expected that students will adhere to high standards of academic integrity. The University will provide resources to assist students to be aware of their responsibilities. It is expected that academic staff will provide appropriate guidance, support and feedback to assist students to become familiar with the normal academic conventions relevant to their discipline.

This policy is consistent with Education at Flinders, the Policy on Research Practice, the Research Higher Degrees Policies and Procedures and the AVCC Universities and their Students: Principles for Provision of Education by Australian Universities.

2 Academic Integrity

2.1 Academic integrity means that all work which is presented is produced by the student alone, with all sources and collaboration fully acknowledged.

2.2 Any failure to meet the requirements of academic integrity in any form of academic work will be regarded as a breach of the requirements of academic integrity and, depending on the circumstances and the nature of the breach, consequences including penalties may be expected to follow. Breaches of academic integrity may include plagiarism, collusion, fabrication, falsification, double submission of work and misconduct in examinations.

2.2.1 Plagiarism

Plagiarism is the use of another person's words or ideas as if they were one's own. It may occur as a result of lack of understanding and/or inexperience about the correct way to acknowledge and reference sources. It may result from poor academic practice, which may include poor note taking, careless downloading of material or failure to take sufficient care in meeting the required standards. It may also occur as a deliberate misuse of the work of others with the intent to deceive. It may include, but is not restricted to:

• presenting extracts, without quotation marks and/or without appropriate referencing, from books, articles, theses, other published or unpublished works, films, music, choreography, working papers, seminar or conference papers, internal reports, computer software codes, lecture notes or tapes, numerical calculations, data or work from another student. In such cases, it is not adequate merely to acknowledge the source. This applies to material accessed in hard copy, electronically or in any other medium;
• close paraphrasing of sentences or whole paragraphs with or without acknowledgement by referencing of the original work;
• adopting ideas or structures from a source without acknowledgment;
• using source codes and data from other's work without acknowledgement;
• arranging for someone else to undertake all or part of a piece of work and presenting that work as one's own;
• submitting another student's work whether or not it has been previously submitted by that student.
2.2.2 Collusion
Collusion occurs when a student submits work as if it has been done individually when it has been done jointly with one or more other person unless the topic coordinator has indicated that this is acceptable for the specific piece of work in question.

2.2.3 Other breaches of the requirements of academic integrity
Other breaches of the requirements of academic integrity may include:
- fabrication or falsification of data or results of laboratory, field or other work;
- submission of the same piece of work for more than one topic unless the topic coordinator(s) have indicated that this procedure is acceptable for the specific piece of work in question;
- providing another student with the means of copying an essay or assignment, including posting on a website or through other electronic means.

2.2.4 Breaches of the requirements of academic integrity in examinations
Breaches of the requirements of academic integrity may occur in the examination process and may include, but is not restricted to:
- being in possession of any material or device which contains or conveys, or is capable of conveying, information concerning the subject matter under examination, other than where this is permitted under the University's Assessment Policy or by an examiner;
- directly or indirectly giving assistance to any other student;
- directly or indirectly accepting assistance from any other student;
- permitting a student to copy from or otherwise use another student's papers;
- obtaining or endeavouring to obtain, directly or indirectly, assistance during the examination or giving or endeavouring to give, directly or indirectly, assistance to any other student.

3 Responsibilities

3.4 Students
Students are responsible for:
- submitting original work for assessment which meets the requirements of academic integrity;
- informing themselves about the expectations of the University and relevant discipline by utilising the information provided by the University and staff. The University has made available the Academic Integrity Management component of the University web site and electronic text matching software for this purpose;
- taking advantage of the education opportunities provided for education on academic integrity, and seeking additional assistance if required;
- adhering to any instructions given by staff about the acceptable level of working together and how their work will be individually or jointly assessed;
- acknowledging that they are aware of, and have met the requirements of academic integrity, by signing an appropriate statement with all assessed work.
CPES 7711 Advanced Techniques in Chemical and Physical Sciences

Modules

Everything you wanted to know about electron scattering but were afraid to ask

Michael Brunger

This course will be based on a book coming out in 2014, to which I contributed a chapter, that looks at how to make absolute cross section measurements for various electron impact processes AND how those cross sections are used in studying the behaviour of plasmas, their role in atmospheric and astrophysical phenomena and their role in radiation damage in matter. The course would mainly be a reading topic with a one hour master class each week for 5 weeks. Assessment would be one PBL paper and a take home exam.

Synchrotron Science

Sarah Harmer and Jamie Quinton

Synopsis: Synchrotron’s enable experiments that’s would otherwise be impossible in the laboratory. Their unique capabilities and properties will be investigated in this topic. A basic foundation in synchrotron science and an overview of potential techniques and applications relevant to physics, chemistry and nanotechnology will be given. The course will enable students to understand and communicate the unique properties of synchrotron radiation, its formation, the interaction of electromagnetic radiation with matter and provide the knowledge of how to carry out a synchrotron experiment relevant to their project.

The course will cover the following topics:

Lecture 1: What is a synchrotron, how does it work?; Electromagnetic radiation from charged particles; synchrotron radiation; and insertion devices.
Lecture 2: Beamlines and their components.
Lecture 3: What are the properties of synchrotron radiation, Interaction of Light with matter?
Lecture 4: Techniques and applications I The soft side: Photoemission, Absorption and Nanospectroscopic imaging.
Lecture 6: Techniques and applications II The hard side: Diffraction, Scattering, Medical Imaging/tomography

Assessment: The topic will be assessed via a written report on a technique that is relevant to the students Honours research project and a talk about that technique and methods of data analysis. The report should describe how the technique works and how you could use the technique for your project with relevant referencing of current literature (10 pg).
Advanced Statistics: Curve Fitting, Deconvolution and Multivariate Statistics

These two modules will address statistical and data analysis techniques for large data sets as well as for complex multicomponent samples and grouping and provenance studies. These two modules will be beneficial for students with projects in the Forensic and Analytical areas, although will also be applicable to other projects as well. Many honours projects require these types of analyses.

**Curve Fitting and Deconvolution**

Rachel Popelka-Filcoff and Claire Lenehan

- Smoothing data sets (e.g. Fourier transforms, band pass filters etc)
- Optimization of experimental parameters (Solver)
- Deconvolution of peaks e.g. XPS (Solver)
- Simulation examples (Solver)
- Goodness of fit
- Titration/Binding Constants/Speciation
- Electrochemistry

5 examples with CML based instruction and workshop that covers above
= 10 hours contact time
+ CML assignment
+ literature assignment, critique?
Exam?

**Multivariate Statistics**

Rachel Popelka-Filcoff and Claire Lenehan

This module will explore advances multivariate techniques for analyzing large data sets to investigate data grouping, cluster analysis and pattern recognition.

Techniques investigated include hierarchical cluster analysis, principal component analysis, canonical discriminant analysis and correlation analysis and multilinear regression. Data investigated will include both single point (e.g. elemental data) as well as analyses of entire spectra.

The module will also address the correct experimental frameworks for collecting data for later statistical analysis.

5 examples with CML based instruction and workshop that covers above
= 10 hours contact time
+ CML assignment
+ literature assignment critique?
Exam?

By the end of the two modules a student will be able to:

- Identify the experimental questions
- Set up the correct experiment to test statistical hypothesis
- Deconvolute data
Analyse data sets using available statistical packages
Use statistical interpretation to analyse the data and answer project aims

Software packages:
Unscrambler
Matlab
Excel
SPSS?
Origin (peak fitting etc)

**Complex Sample Characterisation**

Paul Kirkbride, Claire Lenehan, Rachel Popelka-Filcoff

Use case study to structure student learning and provide framework for analysing existing literature for analysis of plausible and complex (impure or multicomponent) unknown.
Student to synthesise and apply knowledge on advantages and disadvantages of analytical methods to effectively approach the problem

- Small samples
- Matrix effects
- Appropriate standard selection
- Experimental design
- Non destructive analyses
- Integration of multiple techniques
- Statistical approaches
- Sampling
- Costing and cost/benefit
- timelines

Students will generate a proposal to address and justify the above aspects of the project and will be marked on how thoroughly and effectively they address the research question.

= 5 hours contact time
+ case study (60%)
+ oral pitch to agency? (40%)

(comprising infrared microspectroscopy, Raman microscopy, UV-Vis microspectroscopy, direct mass spectrometry, isotope ratio mass spectrometry)
In this module microscopy techniques such as scanning probe, Raman and scanning electron microscopy will be examined. The module will have a strong focus on the practical use of such techniques and applications including reference to some of the latest research and advances in these fields. Each technique will be introduced and lecture content for each will comprise of the following:

1. **Atomic Force Microscopy.** Detailed descriptions of main operating modes e.g. contact (height and lateral force), tapping (height and phase), fluid imaging. Advantages and limitations of each method and discussion of what new methods are emerging e.g. scan asyst, peak-force quantitative mechanical imaging (QNM), carbon nanotube probes. Calibration of components of the AFM. Scanners which include the detector, tip shape, cantilever spring constant. A computer based workshop (1-2 hours) will introduce students to the Myscope training tool and students will be expected to use the AFM training tool to answer questions and produce images using the virtual instrument simulation. In the workshop sample AFM data will be provided and students will be expected to dome some rudimentary analysis of the data (2 lectures, 1 CML workshop, 1 instrument demonstration).

2. **Electron microscopy.** Transmission and scanning electron microscopy will be introduced and lectures will detail some of the theoretical basis of these techniques, describe what type of imaging modes are available on these types of instruments and what information these imaging modes can provide. A computer based workshop (1-2 hours) focussed on the SEM and TEM Myscope training tools will be conducted. Students will be expected to use Myscope to answer questions and produce images using the virtual instrument simulations. (1-2 lectures, 1 CML workshop, 1 instrument demonstration).

3. **Raman microscopy.** The operation and theory that forms the basis of this technique will be introduced and described. Applications of single spectra and Raman mapping/imaging will be given with specific examples of experiments conducted at Flinders e.g. Raman imaging to characterize the internal functionalization of polymer particles, characterising carbon materials, determining the chemical composition of samples. (1 lecture, 1 instrument demonstration).

4. **Instrument demonstrations** will also be included for the AFM and Raman sections using microscopes from the suite of instruments in the Scanning Probe microscope facility in the school. This will involve students observing the use of the instruments and then given question to answer based on these demonstrations, the standard operating procedures for the instruments and training videos where applicable. (Each demonstration will be for 1 to 2 hours).

The assessment will therefore include:
- 2 CML workshops based on Myscope each worth 10% total mark for module (20 %)
- Questions from instrument demonstrations for AFM and Raman each worth 10% total mark for the module (20%)
- Exam worth 60% final grade.

**Molecular Characterisation using Nuclear Magnetic Resonance**

Martin Johnston

The aim of this module is to give students an appreciation of the capabilities of NMR spectroscopy in solving structural problems in molecular systems. The module will introduce students to the basic principles of NMR spectroscopy by examining the various types of instrumentation used. This will then be extended into more advanced concepts by examining experiments used for characterisation and structural determination in molecular systems. The course deals with $^1$H and $^{13}$C spectra as well as both 1 and 2 dimensional experiments.

The theoretical aspects of the topic are reinforced by the practical component of the module in which students will actually run experiments on an unknown material and deduce the structure of that material.
CPES 7721  Advanced Chemical and Physical Sciences

Surface Science

Gunther Andersson

In this module the techniques using electrons, ions and light for probing surfaces will be introduced. The mechanisms for their interaction with matter and general concepts like cross section, probing depth and what makes a method surface sensitive will be discussed. Also the prerequisites for analysing surfaces like surface preparation and the technical facilities will be discussed.

The students will be assessed through writing two assignments in which they shall demonstrate their capability to apply theoretically one of the methods to given scientific problem.
At the end of the module the student shall be able to:
1. Why are surface properties different to bulk properties
2. Describe why a specific method is suitable to analyse a surface
3. Be able to select based on criteria whether a method is suitable to be applied to a given surface analytical problem.
4. Be able to apply theoretical a surface analytical method for investigating a given problem

Membrane Biophysics

Ingo Koeper

Cell membranes are essential components of every cell. The physics behind are very important to understand, if one wants to understand the functioning of a cell.

Content
- lipids and proteins
- lipid monolayer
- lipid bilayer
- Techniques:
  + Langmuir filmbalance
  + Brewster Angle microscope
  + AFM
  + SPR

2 intensive workshops (2x3 hours)
1 practical (2 hours)
self-directed studies 27 hours

Assessment
- prac report 25%
- oral presentation 25%
- project 25%
- quiz 25%
Evidence Evaluation
Paul Kirkbride

This topic will expose students to key areas of evidence evaluation. The topic will include:

1. What is subjectivity and objectivity
2. Probabilities and odds
3. The difference between frequencies, likelihoods and Bayesian models
4. Fallacies and problems in using methods of evaluation
5. Interaction with the legal system
6. Presentation to the court
7. Introduction of new evidence - Frye, Daubert and precedence
8. Facts and opinions in the criminal justice system

The overall objective for this topic is to develop students’ skills and knowledge in regards to the “craft” of providing expert evidence, which is the ultimate function of forensic scientists.

This topic will use and build upon students' prior knowledge of Bayes' Theorem and biological and chemical trace evidence examination. It will highlight modern ways of evaluating and presenting the weight and significance of forensic test results. A case study involving multiple evidence types will be investigated and each student will write an opinion report for court based on their assessment of scientific test results. The report will form the basis of a subsequent moot court exercise in which science students will act as expert witnesses and law students will act as defence and prosecution counsel.

The topic will be presented by a combination of staff from the Schools of Biological Sciences, School of Chemical and Physical Sciences and Flinders Law School.

Energy Production
Joe Shapter/David Lewis

This topic will explore future methods of energy production. It will examine the science behind how the energy is produced and stored using various techniques. The pros and cons of the various proposed production and storage methods will be assessed and debated. Students will also need to evaluate costs of implementation in Australia.

Assessment:

1) Government Report on an Energy Production or Storage Method

2) Presentation on Report subject

3) Presentation in the Novel Energy Systems Conference for Flinders Honours Students
Flow Chemistry

Colin Raston

Flow chemistry, as a type of process intensification, is becoming increasingly important in being able to control chemical synthesis in developing more sustainable chemical processes for the future. This is important in the materials and pharmaceutical industry in reducing the waste stream and the environmental footprint of the processes. The topic will explore the methods used in flow chemistry, in incorporating scalability into the chemical processing from the outset, as a new paradigm in chemical synthesis.

Assessment:

(1) One assignment on process intensification strategies
(2) One assignment on a specific application of continuous flow platforms
(3) Presentation on an aspect of (1) and/or (2)

Techniques of Theoretical Physics

Boris Blankleider

The aim of this module is to introduce students to the “toolbox” of methods and techniques used for solving problems in theoretical physics. A basic component of such a toolbox is the use of the low-level computer language Fortran 95 to solve physics problems numerically. Another, closely related component, is the knowledge of basic numerical methods for solving the various differential and integral equations encountered already in the undergraduate physics program. Yet another computer-based tool for the practical solution of physics problems is the intermediate-level language of Mathematica. However, the methods and techniques of theoretical physics are wide-ranging and can include diverse subjects such as computer simulations, statistical methods, and Quantum Field Theory.

In view of the broad scope of this module, it is envisioned that the actual subject matter taught will be chosen from year to year based on the background and interest of the student audience at the time. As such, the module should be of practical use to all students, whether experimental or theoretical.

A possible schedule for the presentation of the module is two lectures/workshops per week, for 5 weeks, possibly held in the CML. Assessment would be through 5 weekly assignments.
Stereoselective Synthesis

Mike Perkins

7 Lectures, 3 Tutorials

Associated texts. 1. Stereochemistry of organic compounds / Ernest L. Eliel

Assessment. 1 1/2 hr Exam 70%, assignment 30%.

Topic Outline:
The course begins with the terminology and categories of stereoselective synthesis: diastereoselective synthesis, enantioselective synthesis and double stereodifferentiating reactions. These different categories of reaction are then studied in detail, using specific examples of Aldol reactions and Claisen rearrangements to illustrate the basic principles.

Diastereoselective synthesis
Diastereoselective synthesis of achiral compounds: diastereoselective synthesis of alkenes from alkynes, elimination, pericyclic reactions, and ring fragmentations.

Enantioselective Synthesis

Double stereodifferentiation
Interactions between principal chiral reactants. reagent control, kinetic amplification.

The Physics of Dynamical Space

Reginald T Cahill

From the beginning of physics, with Galileo and Newton, and until very recently, space has been understood and modelled to be a purely geometrical entity. However, data from experiments going back to 1887 and up to the present demonstrate that space is actually a complex dynamical system, explaining many aspects of reality, from the anisotropy of the speed of light, the origin of gravity, the source of randomness in quantum phenomena, the expansion of the universe, and numerous other effects. This topic will review the numerous techniques that have detected the dynamical space, and also review the theory for this dynamical space that has passed all observational and experimental tests.
CEEM Honours Module  
Introduction to Energetic Materials  
Chad Prior/Stewart Walker

Brief description
The module aims to introduce the student to the chemistry of energetic materials. Students will learn the history of energetic materials, characterisation techniques specific to energetic materials and the chemistry of explosives, pyrotechnics and propellants. This module is worth 1.5 units.

Module Structure
The module will consist of 11 lectures on the following topics:
Lecture 1 History and Introduction to Energetic Materials
Lecture 2 & 3 Characterisation of Energetic Materials
Lecture 4 Energetics – determining effectiveness of energetic material
Lecture 5 & 6 Chemistry of Explosives, including ingredients, formulations & molecular design.
Lecture 7 & 8 Chemistry of Pyrotechnics
Lecture 9 & 10 Chemistry of Propellants
Lecture 11 Environmental aspects of Energetic Materials

Assessment
1. Students will be given a research topic, with one-three journal articles, and asked to prepare and present a 20 minute oral presentation showing their understanding of the topic. A panel of four CEEM members will be present for the assessment. (30%) (20 hours)
2. Homework based questions will be set at the end of each lecture. (10%) (5 hours)
3. Students will undertake a two hour exam on the lecture material. (60%) (2 hours +10 study)

Molecular Symmetry and Spectroscopy
Jason Gascooke

Brief description
The shape of a molecule has profound effects on the molecule’s interaction with light. Understanding the symmetry of a molecule helps us to understand transitions seen in vibrational and electronic spectra. This module gives an overview of the symmetry of molecules and the implications of this on molecular spectroscopy. The symmetry section of the module will include identifying molecular symmetry elements, symmetry operations, assignment of point groups to molecules and a discussion of symmetries of molecular vibrations and molecular orbitals. Applications of molecular symmetry will be highlighted through examples in chemical bonding and spectroscopy, including microwave, infrared, Raman and UV-Vis spectroscopies.

Module Structure
The module will comprise of lectures/workshops and self-directed learning.

Assessment
1. Written assignment applying methods of molecular symmetry to an assigned molecule that will include literature searching for spectroscopic data and performing electronic structure calculations using Gaussian (or equivalent) software. (40%)
2. Two hour exam on lecture material. (60%)
Use (and Abuse) of Mass Spectrometry in Research
Stewart Walker

Brief description

The module aims to equip students to get maximum use (and minimum abuse) from using mass spectrometry in their research. This module is worth 1.5 units.

Module Structure - the module is in three parts:

Part 1 Four lectures covering different types of mass spectrometry available for research – especially at Flinders (CaPS, Flinders Analytical, Flinders Medical Centre) but including other types available externally (University of Adelaide, UniSA, CSIRO, AWRI and SAHMRI etc). The students will gain an understanding of what lies ‘under the bonnet’ – quadrupole, magnet, ion-trap etc. and therefore an understanding of the different techniques used to produce the spectra and also potential errors in their mass spectra.

Using real (but anonymous) examples the students will be able to identify errors in obtaining and interpreting mass spectra so that they can avoid these pitfalls in their work.

Examples include how to (and not to) use
- too weak a sample resulting in analysis of background and column bleed
- too strong a sample resulting in overloading in ion-traps (due to geometric constraints and ion-molecule reactions)
- erroneous assignment of molecular ions (e-.Ionisation vs Electrospray)
- reference to IAEA standards for isotope ratio mass spectrometry
- coping with iso-baric interferences in ICPMS

Part 2 The students will investigate use of a particular instrument that may be of use to them in their research to find examples from the literature of use (and possibly abuse).

Part 3 The students will report back to the group on their findings so that all can gain information about the full range of mass spectrometers and their use for their research. (Time to be arranged – depending on numbers of students).

Assessment

Part 1 Will be assessed by a 2 hour exam worth 50 %
Part 2 Will be assessed by a short (5 page) written report worth 30%
Part 3 Will be assessed by peer marking of oral presentation worth 20%
Honours Forms

The following forms and paperwork should be read carefully and completed.

Please return all forms to the School Office

PLEASE NOTE:
(ADDITIONAL FORM)

Once you have completed all OHS Training Sessions you will need to complete the:

WAH Approval Form for Building/Laboratory Card Access

This form is an electronic form and is located on the Shared Drive at

# STAFF/STUDENT CHECKLIST

To enable your School computer user account/building access/store access to be established, this form must be completed and signed upon your commencement within the School of Chemical and Physical Sciences.

## 1. NEW STAFF to complete this section

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<td>SUPERVISOR (STAFF):</td>
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<tr>
<td>I verify that the abovementioned information is correct and I agree to abide with the Computer Usage Policies (page 2)</td>
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<tr>
<td>SIGNED:</td>
<td>DATE:</td>
<td>/</td>
<td>/ 20</td>
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## 2. NEW STUDENTS to complete this section

<table>
<thead>
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<th>LAST NAME:</th>
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<th>PREFERRED NAME:</th>
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<tr>
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<td>ROOM NO.:</td>
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<tr>
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<td>(start with Principal supervisor)</td>
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<tr>
<td>SIGNED:</td>
<td>DATE:</td>
<td>/</td>
<td>/ 20</td>
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## 3. VISITOR to complete this section

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<tr>
<td>POSITION:</td>
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<td>SUPERVISOR:</td>
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<td>/</td>
<td>/ 20</td>
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</table>
4. SUPERVISOR to complete this section

ACCOUNT NUMBER:

01 380 __ __ __ __ __
01 380 __ __ __ __ __ 3 2 9 8

EMAIL DISTRIBUTION LIST/S: (please add person to the following list/s)

NANOCENTRE

OTHER (please specify)

SIGNED: ___________________________ DATE: ___ / ___ / 20

PRINT NAME: ___________________________

5. DECLARATION (to be completed by new staff/student/visitor)

I UNDERSTAND that my use of the computing facilities within the School is governed by the University Guidelines to Compliance with Policy on Acceptable Use of Information and Communication Technology (ICT) Resources (http://www.flinders.edu.au/ppmanual/student/ict-guide.html) and that there are severe penalties for the misuse of any University Computing facility.

I UNDERSTAND that laser and colour printing facilities are charged for.

I AGREE not to divulge to any person the password allocated to me for the use of these facilities or to allow any other person to use my account.

I AGREE to remove any confidential material from my account before leaving the School permanently or to provide written instructions regarding the disposal of my files.

I AGREE to arrange to have my account backed up before leaving the School for more than three months and understand that once my account lapses my files may be purged and not be recoverable.

I UNDERTAKE not to lend my access card to any person and to inform the Security Office immediately if my access card is lost.

I WILL REPORT to the Security Office immediately any breaches of building security of which I become aware.

I UNDERSTAND that permitting any other person to enter the building when I have opened the door using my access card could be detrimental to the security of the building and its contents and personnel therein.

I /……………………………………………………………………………………………………………….. (Please print full name) hereby declare that any work undertaken by me and processed in the computer facilities of the School and University will be performed in accordance with the Computer Facility Rules of the Flinders University and the Local Facility Rules.

SIGNED: ___________________________ DATE: ___ / ___ / 20

OFFICE USE ONLY

ENTRY DETAILS (Entrance Date………………………………….)
Copies emailed to:
□ Computer Services Unit
□ Physical Sciences Store

□ OH&S Induction ___________________________ Date/Initials
□ Plant Risk Assessment Training ___________________________ Date/Initials
□ Hazardous Substances Training ___________________________ Date/Initials
□ Key Issued ___________________________ Date/Initials
□ Building Access ___________________________ Date/Initials
□ Internal Phone List ___________________________ Date/Initials
□ Space Register ___________________________ Date/Initials
□ Photocopier PIN ___________________________ Date/Initials
□ Pigeonhole ___________________________ Date/Initials
□ Website ___________________________ Date/Initials

EXIT DETAILS (Exit Date………………………………….)
Copies emailed to:
□ Computer Services Unit
□ Physical Sciences Store

□ Key Returned ___________________________ Date/Initials
□ Building & Lab Access ___________________________ Date/Initials
□ Email Lists ___________________________ Date/Initials
□ Internal Phone List ___________________________ Date/Initials
□ Space Register ___________________________ Date/Initials
□ Photocopier PIN & Scan ___________________________ Date/Initials
□ Pigeonhole ___________________________ Date/Initials
□ Website ___________________________ Date/Initials

Updated 23/4/2013
SCHOOL OF CHEMICAL AND PHYSICAL SCIENCES

Authority to Issue Key

This form is to be used to issue a key(s) to office and other rooms within CaPS.

Family Name________________________ First Name________________________ Title________________________

Preferred Name_____________________

Staff

☐ Academic
☐ Admin
☐ Laboratory
☐ Technical

Student

☐ Honours
☐ Postgraduate
☐ Other

Other Details______________________________________

Keys Requested

<table>
<thead>
<tr>
<th>Key #</th>
<th>Room #</th>
<th>Building</th>
<th>Date of Issue</th>
<th>Date Returned</th>
<th>Comments</th>
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</tbody>
</table>

Length of time key will be required: _________________

(Deposit of $20 per key is required if less than one year [inc Honours students]):

Deposit Paid: Yes/No

Date: / / Receipt #: Deposit Refunded: / /

Reason for key being returned______________________________________

Keyholder:

I agree that I am responsible for all the above keys and that I will return them to the CaPS School Office when the above position/enrolment/visit ceases.

Keyholder’s signature________________________ Date:_________

Authorisation:

Area Supervisor’s Signature________________________

Area Supervisor’s Name________________________

Email or Fax Key Request Form to Phillip.Jones@flinders.edu.au OR Fax 13790.
Honours Topics Module Selection Sheet

Please return to the school office by 12:00 Noon on February 13, 2015

For each topic, students are required to undertake three modules. Please tick the three modules in each topic that you are going to do. This sheet must be signed by your supervisor and then returned to the school office.

Student Name ______________________________

CPES 7711 Advanced Techniques in Chemical and Physical Sciences

<table>
<thead>
<tr>
<th>Module</th>
<th>Lecturer(s)</th>
<th>Please Tick</th>
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</thead>
<tbody>
<tr>
<td>Everything you wanted to know about electron scattering but were afraid to ask</td>
<td>Michael Brunger</td>
<td></td>
</tr>
<tr>
<td>Synchrotron Science</td>
<td>Sarah Harmer and Jamie Quinton</td>
<td></td>
</tr>
<tr>
<td>Curve Fitting and Deconvolution</td>
<td>Rachel Popelka-Filcoff/ Claire Lenehan</td>
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</tr>
<tr>
<td>Multivariate Statistics</td>
<td>Rachel Popelka-Filcoff/ Claire Lenehan</td>
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<tr>
<td>Complex Sample Characterisation</td>
<td>Paul Kirkbride/ Claire Lenehan/ Rachel Popelka-Filcoff</td>
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<tr>
<td>Scanning Microscopy</td>
<td>Chris Gibson</td>
<td></td>
</tr>
<tr>
<td>Molecular Characterisation using Nuclear Magnetic Resonance</td>
<td>Martin Johnston</td>
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</table>

CPES 7721 Advanced Chemical and Physical Sciences

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<th>Module</th>
<th>Lecturer(s)</th>
<th>Please Tick</th>
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<tr>
<td>Surface Science</td>
<td>Gunther Andersson</td>
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<tr>
<td>Membrane Biophysics</td>
<td>Ingo Koeppe</td>
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<tr>
<td>Evidence Evaluation</td>
<td>Paul Kirkbride</td>
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<tr>
<td>Energy Production</td>
<td>Joe Shapter/David Lewis</td>
<td></td>
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<tr>
<td>Flow Chemistry</td>
<td>Colin Raston</td>
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<tr>
<td>Techniques of Theoretical Physics</td>
<td>Boris Blankleider</td>
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<tr>
<td>Stereoselective Synthesis</td>
<td>Mike Perkins</td>
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<tr>
<td>The Physics of Dynamical Space</td>
<td>Reginald T Cahill</td>
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<tr>
<td>Introduction to Energetic Materials</td>
<td>Chad Prior/Stewart Walker</td>
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<tr>
<td>Molecular Symmetry and Spectroscopy</td>
<td>Jason Gascooke</td>
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</tr>
</tbody>
</table>

Supervisor Name___________________________  Supervisor Signature ________________