PROPOSAL FOR A NEW EXCHANGE AND STUDY ABROAD PROGRAM

University of Technology Sydney, Australia
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A. Rationale for Adding Program

1. Why University of Technology Sydney, Australia?

The University of Technology Sydney, Australia offers Saint Mary’s students a fantastic opportunity to study practically any subject area in one of the country’s top universities. Sydney, long an attractive destination for SMC study abroad students was removed from the selection list due the inordinately high cost of the program that had been previously offered in conjunction with The Education Abroad Network (TEAN) and partner campus, University of Notre Dame. In addition, for many years, there has been a lack of opportunities for our science majors to study abroad due to the rigorous SMC science curriculum demands and UTS offers the opportunity for these students to realize their study abroad goals while being able to keep up with required coursework. In addition, with SEBA’s current AACSB process in motion, the fact that UTS has already received AACSB accreditation makes it an excellent destination for business majors. Among Saint Mary’s students, there is a consistent and increasing interest in study abroad in Australia, where SMC students have all curriculum offered by UTS open to them since the language of instruction is English. UTS provides SMC students a vibrant intellectual experience that will deepen their intercultural skills while also allowing them to stay on track with the academic requirements here at home.

Contracting with University Technology Sydney (UTS) will allow the Center for International Programs to meet student demands for academic study in Sydney. SMC proposes to have an exchange agreement and study abroad (fee paying) program. Once the exchange quota is fulfilled (1-2 students per year), then additional SMC students can enroll at UTS under the study abroad agreement. The exchange will allow interest from our students to grow as they will have the opportunity to meet UTS students and possibly form friendships that can be continued when they embark on a study abroad program to Sydney. We currently have Australian student athletes, but due to their training and other athletic commitments, they are not able to be involved in many of the events the Center for International Programs hosts to encourage intercultural understanding between the international student and domestic SMC student community. Increasing our enrollment of Australian students will allow SMC students to have the opportunity to interact with Australian students and learn more about the country, culture and its customs.

UTS is a comprehensive university located in Sydney’s city centre and home to approximately 37,000 students (23,000 undergraduate, 11,500 postgraduate coursework and 1,200 higher degree research; with approximately 7,000 international students across these areas). UTS exchanges over 1000 students annually to 36 countries.
UTS Business School (AACSB) was ranked by the QS World University Rankings in the Top 100 for Economics and the Accounting and Finance fields. UTS was ranked 268 in the QS World University Rankings, with Engineering and IT ranking at 143 worldwide. UTS joined the Shanghai JiaoTong Rankings of the Top 500 Universities in 2011 and is ranked 12th in Australia in the Excellence in Research for Australia (ERA) rankings. All study areas at UTS are rated at world standard or above by ERA rankings and with outstanding performance well above world standard in Environmental Science and Economics.

B. Program design

1. Where will the program take place?

University of Technology Sydney, UTS, is a public institution located in New South Wales, Australia. UTS is located in Sydney (population about 4,627,345) the state capital of New South Wales and the most populous city in Australia. Surrounded by many iconic features such as the Sydney Opera House, UTS is a window to the world. UTS city campus is right by Central Station, the heart of Sydney's transport network. The campus and its diverse surroundings offer students a wide choice of activities such as cycling, surfing, and hiking. The urban area itself has around 70 harbor and ocean beaches and the nearby Blue Mountain Range offers students a unique opportunity for rock climbing, mountain biking and hiking.

UTS offers an excellent education at one of Australia’s high quality teaching universities, combined with a rich, exciting learning experiences in Australia’s global city Sydney. UTS hosts more than 300 study abroad and exchange students each semester from all over the world. With around 37,000 students from 120 different countries including Australia, UTS is a reflection of Sydney’s multicultural diversity. Living and studying in one the world’s most multicultural cities will develop student’s interpersonal skills and cultural knowledge. Its undergraduate program offers bachelor’s degrees in Business, Communication, Design, Architecture, Education, Engineering, Information Technology, Law, Science and six modern language programs. Most of the international students studying at UTS are exchange students from partner institutions. Currently, UTS has partnerships with 160 universities in over 28 countries and regions. Below is a list of their U.S. partners:

California State University, Sacramento
Clarkson University
Florida Atlantic University (in progress)
George Mason University (in progress)
Kent State University
Michigan State University (in progress)
Northern Arizona University
Oregon State University
Pace University
San Diego State University
San Francisco State University
State University of New York at New Paltz
University of Arizona
University of Hawaii at Manoa
University of Miami
University of Minnesota (in progress)
University of North Carolina Exchange Program:
Appalachian State University
East Carolina University
North Carolina Agricultural and Technical State University
North Carolina Central University
North Carolina State University
University of North Carolina at Asheville
University of North Carolina at Charlotte
University of North Carolina at Greensboro
University of North Carolina at Wilmington
Western Carolina University
Winston-Salem State University
University of Texas at Austin
University of Texas at El Paso

2. Which semester is it designed for? Could it apply to both semesters?

The academic year is divided into two main semesters: First semester from February to June (Semester 1, Autumn); and Second Semester from July to November (Semester 2, Spring). The program will be offered during the Fall (Autumn) and Spring semesters. The calendar at UTS will allow for SMC students to easily take one semester abroad without missing out on Jan-term courses. Students could also opt to study abroad for an academic year but should be advised of the long break in between the Fall and Spring semester. Academic year students will need to take 9 courses total to make up for missing Jan-Term. Additionally, academic year students will need to have the Director of Jan-Term approve one of the courses abroad to count for Jan-Term. Taking more than 4 courses per semester at UTS is a very heavy load, however, year students have the option to take a 5th course during one of the two semesters if they choose in order to stay on track with their 9 courses per academic year.

3. What are the learning outcomes for the program?

As a result of their participation in the study abroad program with University of Technology Sydney students will:

- Gain hands-on experience in whichever course they choose
- Experience dynamic teaching
- Integrate theory with practice to deliver a real-world education across many platforms of learning

4. How many students can attend?

The exchange agreement will take priority over study abroad (fee paying) program. Once the exchange quota is fulfilled, then additional students can enroll at UTS as fee paying study abroad students.

Study Abroad:
UTS agrees to host 10 students per semester (up to 20 students per academic year) on a fee paying basis. UTS will consider increasing numbers based on demand and availability.

5. Does the program include an SMC faculty member’s participation? If so, how?

UTS does not require an SMC faculty member’s participation. UTS has a full complement of over 2700 faculty, professional staff and student support services professionals, to provide an integrative and comprehensive program for SMC students. Also, at UTS students will have an assigned academic advisor should academic issues arise and the SMC faculty advisor would like to have someone to discuss academic matters with a UTS representative.

6. What is the design of the program overall in terms of study time, travel itinerary, housing, transportation, and cultural immersion opportunities? What are the typical fall/spring program dates?

**Fall Semester 2013 program dates (July -November):**
Check-in to Residential Housing 19 July, 2013
New Students Orientation (Mandatory) 22-25 July, 2013
Course registration is arranged prior to arrival at UTS
‘O’ Day 24 July, 2013
Classes Begin 29 July 2013
Add / Drop Period 29 July-9 August, 2013
Withdrawal Deadline 30 August, 2013
UTS Infusion Festival TBA
Non-Teaching Week 30 September - 4 October
Semester End Gathering TBA
Final Examinations 11-29 November, 2013

**Spring Semester 2014 program dates (February-June):**
Check-in to Residential Housing 13 February, 2014
New Students Orientation (Mandatory) 10-21 February, 2014
Course registration is arranged prior to arrival at UTS
O’Day 19 February, 2014
Classes Begin 24 February, 2014
Add / Drop Period 24February – 7 March, 2013
Withdrawal Deadline 31 March, 2014
Non-Teaching Week 21-25 April, 2014
Final Examinations 7-27 June, 2014

**Accommodation at UTS**
Study Abroad students applying for UTS Housing by the due date will be guaranteed a room at one of the UTS residences. Students have the option to apply to 5 different residence halls, all within walking distance of the UTS main campus. The residences are fully furnished and have access to public spaces, including a shared kitchen area. Each residence floor has a resident assistant that can serve as a resource for SMC study abroad students.
The Housing Application deadlines are 15 May and 15 November for the following semesters. Students are required to apply through the [UTS Housing website](#) They should be sure to note in the application section that they are a “study abroad student” to receive the guarantee. Students can apply for [UTS Housing](#) without waiting for the official UTS Study Abroad acceptance letter. Students will be required to sign a 6 month (semester) or 12 month (2 semesters) lease agreement. (*)Please note that students may not necessarily be offered their first preference of residence.

**Dining**

UTS Housing has kitchen facilities but there are no meal plans available. The location provides a plethora of restaurants and take-out options as well as nearby supermarkets. UTS is adjacent to Sydney’s vibrant and cheap Chinatown area with over 500 food outlets.

**Off-Campus Activities**

UTS Student Union and Student Associations arrange a variety of sporting, recreational and social events for students each semester as listed in their Activities Guide. It includes an exciting range of short courses, day trips, outdoor adventures, and weekend trips.

7. What are the benefits of this program for both the students and SMC?

**Academic Support and Advising**

University Technology Sydney prides itself in being a caring and supportive academic community where it is easy for students to meet and talk to faculty members. The university encourages students to communicate with faculty and staff members openly and seek advice of any kind whenever needed.

As part of the Study Abroad application and acceptance processes, student’s study programs are discussed and set well before their arrival. SMC students will consult with their academic advisors to ensure the transferring of credits.

Students have an opportunity to discuss their class choices and to adjust their enrolment after arrival and until week two of semester. However, SMC students will continue to adhere to the course selection they discussed with their SMC academic advisor.

One of UTS’s great academic strengths is the opportunity for international students to have access to academic support through the use of the faculty-based Student Service Centers for official advice.

1. They may visit with individual faculty and lecturers in class or in their offices and chat with their teachers about academic and non-academic matters.
2. They have more formal access to a subject coordinator, should they experience problems in class.

The UTS Student Services Unit and its Service Centers provides an integrated professional service to students that:

1. Supports and empowers them to achieve their study, health, personal and career goals.
2. Advocates recognition and respect for their diverse cultural backgrounds and individual needs at all levels of the University.
3. Promotes the development of University policies and practices that respond effectively to the changing needs of students.

As well as providing direct services the Unit is involved in a number of "student development" programs that are designed to support students at critical / transition points e.g. orientation and first year support activities; in preparation for graduation and employment. Other programs are designed to assist students who may have special needs (eg: international students, students with disabilities, students in UTS Residences) or be "at risk" of academic failure / underachievement (e.g. special entry students, students undertaking 'high failure' subjects, students placed on probation at the end of their first semester). The services aim to help students to:

- Get connected
- Get global experiences
- Get help
- Get skilled
- Get work ready
- Share your experience

UTS’s Advising System is designed to stimulate students’ academic interests, assist in optimal use of the university resources, and support in overcoming students' academic and personal challenges. Students may benefit from advice based on experience beyond the professional life of their mentors.

Class Sizes

Most UTS subjects are taught through a mix of lectures and tutorials, seminars or laboratory sessions. Class sizes vary depending on the popularity, year level of a subject and the nature of teaching. Normally, subjects involve a formal lecture and then a tutorial or laboratory classes which have 15 to 25 students in a classroom. These normally total between 12 and 24 hours of contact per week. Lectures/seminars are taught by faculty, and the tutorials/labs are either taught by the same faculty, graduate assistants or lecturers.

Faculty

How qualified are the faculty and staff of the institution? (Please include degrees, awards, special requirements of Professors and other Faculty)

UTS has 959 permanent members on their academic staff of which 73% have doctoral degrees. There are additionally a number of casual tutors and staff. Total professional, support and academic staff numbers at UTS, is 2757 full-time equivalent. Most courses consist of 1 hour lecture and 2 hours of tutorials. Lectures are taught by faculty with doctoral degrees, while tutorials may be taught by faculty with doctoral or masters degrees, or graduate students.
Library Services

The University of Technology, Sydney takes a special interest in its research facilities - equipped with collections of workshops and software programs designed to help students develop the skills required for analysis. The UTS Library provides “Advanced Database Searching” covering key strategies to maximize relevant results from databases and developing a comprehensive search strategy for researched topics. The library also offers collaborative tools, InterLibrary loans and the ease of access to research professionals.

8. What are the potential concerns, including such things as safety, security, or other risk factors?

UTS International has advanced emergency management plans and protocols which can be provided on request. The Australian ESOS Act requires that UTS has a registered emergency management protocol registered with the federal government covering International Students. Please see ‘Safe at UTS’ - UTS security web site for all details of the emergency and safety support plans at UTS - http://www.uts.edu.au/about/mapsdirections/safe.html
In the event of an emergency, security guards are on-call 24 hours a day, and members of the Division of Student Services carry emergency mobile phones at all times. Emergency contact information will be provided to all international students upon arrival on campus.

9. How does this program meet student interest/need?

The UTS program provides access to students who desire to study with extraordinary resources with a broad variety of opportunities and amazing career prospects. The location provides students with the advantage of matriculating in a foreign environment - specifically students with a curiosity for the Australian curriculum and metropolitan life.

10. What co-curricular activities are available to students? Highlight some of the student life resources available to students (clubs, health center, resources centers, etc)

Clubs and Student Involvement

At UTS, there are over 100 cultural, sporting, religious, social, and political clubs and societies for you to join. Whether it’s Debating Club, United Nations Society, Electronics Gamers Guild, or even the Hip Hop Society – students are bound to find something that suits their interests. Club sports are also available from fencing, to rugby and even to capoeira. All clubs host events during the semester such as at the start and end-of-semester parties, theme nights, trivia nights, festivals and inter-university competitions.

Health and Student Resources

SMC students will be required to purchase the Australian Overseas Health Coverage while studying abroad at UTS, which they can use to visit the UTS Health Services as well as other doctors, hospitals and clinics. Health services provided by UTS include, but are not confined to: the treatment of a range of medical conditions, illnesses and other physical complications. A doctor is available by appointment, for drop-ins and for urgent problems. Consultations are
available for a broad range of health, sexuality and other lifestyle issues. Advice and assistance are also available for travels, women’s health issues, students with examination difficulties or those in need of special assessment arrangements because of a disability or medical condition.

Counseling services are confidential and are able to aid students if they: have chosen a wrong course, have stressful or emotional issues that may interfere with studies, need help managing administrative problems or have complaints, need help developing better generic learning skills, and are seeking aid with any academic difficulties. International Students are also provided with many other support services from career advice to discrimination and harassment prevention, peer networking groups, etc…

C. Academic design

1. What are the admission requirements for students? Are there any prerequisites?

To be eligible for admission applicants must:
1. Demonstrate enrollment at their home university both at the time of application and during their stay at UTS.
2. Complete at least one full year or more of study at a recognized institution. *If the student has not completed one full year at a recognized institution, he or she can still apply if the university matriculation requirements are met.
3. Demonstrate a ‘credit’ or ‘good’ average or a cumulative Grade Point Average (GPA) of 2.8 on a 4.0 point scale.
4. Meet English language entry requirements if a non-native speaker of English.

2. Which student majors/concentrations does the program target? Is it open to all students? If not, why?

UTS allows students to take Study Abroad in most academic majors and concentrations with courses, including the Sciences Business, Communication, Information Technology and Engineering. There are limited restrictions on students choosing subjects at UTS who demonstrate requisite study background. Study Abroad advisors assist students with their requested subject choices as part of the application process.

Although UTS offers a plethora or curriculum that may be of interest to SMC students, UTS offers strong curriculum in the sciences. Dean Roy Wensley is working with the faculty in the School of Science in identifying courses that can be pre-approved for science students. This will facilitate the process for science students and will aid in the academic advising process. For sample course descriptions, please see Appendix I.

UTS study abroad therefore allows students access to 2000 subjects across the following areas:

- Business (Finance, Accounting, Economics, Marketing, Management, Operations, Sports, Events and Leisure)
- Communication (Journalism, Social Inquiry, Knowledge Management, PR, Sound and Music, Media Arts and Production)
- Education (Adult, TESOL, Primary and Secondary, Aboriginal); Engineering (Civil, Environmental, Structural, ICT, Software, Energy, Mechanical and Mechatronics, Manufacturing)
- Information Technology (Database, Information Systems, Games Design et al)
- International Studies (Cultural and Language Studies – French, Italian, German, Spanish, Chinese and Japanese programs – 8-10 levels)
- Law
- Health and Medical studies
- Sciences (including Mathematics, Biological, Environmental, Marine, Chemical and Physical Sciences, Forensics, and Chinese Medicine.

A **Visiting Research Student** with a suitable academic background can seek supervision and have access to Research Dissertation subjects across UTS’s research areas. Research students may study for one or two semesters if academic supervision is available in his/her area of research at UTS. The student will not receive a UTS award or be paid, but will receive an official Academic Transcript.

The **Australian Language and Culture Program** allows students to complete full-time studies for one or two semesters that will develop their English language skills through the study of Australian language and culture. The student may study subjects in the program for one semester, and then take an IELTS or TOEFL test. Upon meeting the UTS English entry requirements, the Study Abroad and Exchange Team can help him/her enroll in UTS faculty subjects for the second semester.

3. **If there is a third-party institution involved academically, what is the institution known for?**

UTS is an accredited university and supports all its own academic programs. SMC students will be directly enrolling to UTS and there will not be a third-party provider.

4. **If English is not the primary language, programs should include a language component, either by requiring language prior to departure or by including language within the program. How will the program address the language component?**

All courses at UTS are taught in English.

5. **How will the courses transfer back to Saint Mary’s?**

- At UTS most courses (subjects) are 6 UTS Credit Points and a full time study load is 24 UTS Credit Points per semester.
- Special permission from the faculty is required for students to take more than 4 subjects (courses) in a semester.
• A minimum full time load for the Australian student visa holders is 18 UTS Credit Points per semester.
• The 24 UTS Credit Points is equivalent to 15 US semester credit hours of work expectation.
• Some UTS subjects (courses) in Communications are 8 UTS Credit Points, so students would take 3 subjects (courses) as a full time load.
• Students will be advised to take a maximum of 24 UTS Credits Points in order to carry a manageable load.

Contact hours may vary with lectures, tutorials, seminars and labs, but are basically similar to those required in the US. Australian universities tend to expect more independent study and out of class commitment from students than they might normally experience at home.

SMC students will be expected to take 4 courses (subjects) per semester. In the event the student stays for a full academic year, they are expected to take 9 courses per the academic year.

6. What are the courses offered?

As noted above UTS has seven faculties and teaches and researches in the following major Faculties (Schools).

• UTS Business School
• Faculty of Arts and Social Sciences
• Faculty of Design, Architecture and Building
• Faculty Engineering and Information Technology
• Faculty of Law
• Faculty of Health and School of Pharmacy
• Faculty of Science

UTS offers enrolled students an innovative and high-quality learning experience with an emphasis on hands-on practical experience throughout students’ studies with a choice of over 300 programs at undergraduate and postgraduate levels. UTS aims to create work-ready graduates valued in the workplace for their practical skills. (Access more detailed information on our approach to teaching and learning here: http://www.uts.edu.au/study/why.html)

7. How many weeks is the program?

UTS Autumn and Spring Semester programs are 16 weeks, including one or two weeks of orientation, mid-semester break, and examination periods.

8. How are transcripts to be processed (e.g., by SMC or the third-party institution)? If third party, what is the contact information for that person and institution.

UTS Registrar’s Office will send official transcripts directly to SMC’s Center for International Programs.
9. Please provide any other background information about the program and institution:

1. UTS Exchange and Study Abroad pre-enrolls students into their study program before arrival.
2. UTS also offers complimentary arrival pick-up.
3. UTS provides a comprehensive Orientation program to assist with integration into UTS student and study life, including an innovative "Community Connections" cultural and social program, aimed at integrating local and international students on campus.
4. Students can join the Beyond UTS International Leadership Development (BUiLD) program to develop international leadership opportunities by participating in internships as well as service-learning opportunities.

UTS is committed to providing the best campus experience with innovative learning and teaching spaces. The AUD $1.1 billion campus development master plan due to be completed in 2018, includes an already completed gymnasium, 720 bed housing tower and refurbished internal spaces and amazing new graduation hall. Although there is construction around the campus, the contractors regularly communicate with UTS to ensure students are not distracted by the noise. Furthermore, contractors try to work after hours and cease construction during exam periods. Please note while Dean Roy Wensley and Maria Flores were on a site visit at UTS from March 18-19, 2013 they did not feel there were any disruptions due to the nearby construction. They also did not hear noise caused by the construction while inside the UTS campus building.

The new Broadway Building, which will be host to UTS’s Faculty of Engineering and Information Technology, and the Dr Chau Chak Wing Building, Sydney’s first Frank Gehry-designed building, which will house the UTS Business School are due to be operational in 2014. You can access further information about the campus master plan here: http://www.fmu.uts.edu.au/masterplan/

D. Budget design

1. Using the budget template enclosed, does the program meet the budget requirements?

Study Abroad:
SMC study abroad students will continue to pay SMC tuition costs and will pay accommodation and health insurance fees directly to UTS.

Exchange:
The UTS / SMC exchange agrees to waive tuition costs at the host institution. Home institutions will continue to charge their students home tuition costs. Accommodations will be paid by the student directly to the host institution. Additional fees (including insurance, student fees, etc.) are negotiated and agreed upon in the institutional affiliation agreements.

2. For every budget line, please provide an explanation of projected cost. This should include a detail of every proposed activity within the excursion line.

Please see budget spreadsheet, Appendix II.
Appendix I: Sample syllabi

91154 Ecology

Requisite(s): 91107 The Biosphere OR 91123 Biocomplexity

Handbook description

Management and remediation of the vast array of environmental problems facing the globe require a rigorous, scientific understanding of how ecosystems work. In this subject, students are introduced to fundamental ecological principles underpinning the structure and function of ecosystems. Theoretical and empirical examples are provided using a broad cross-section of organisms (e.g. invertebrates and vertebrates) and ecosystems (e.g. aquatic and terrestrial) with a focus on the application of ecological knowledge to the conservation and management of biodiversity. Field work in several different systems (e.g. woodland vegetation, rocky shore habitat) during practical classes is compulsory. This subject is an important link to a range of third-year subjects that require a deep understanding of ecological concepts.

Subject objectives/outcomes

On successful completion of this subject, students will have developed:

- An understanding of the language of ecology and the ecological principles that underpin ecosystem structure and function.
- An awareness of the flow of energy and matter through ecosystems; nutrient cycles; and global variation in climate and primary productivity.
- An appreciation of how biotic and abiotic features of the environment relate to the distribution, abundance and diversity of species.
- An understanding of methods for describing the ecological structure of animal and plant communities (e.g. species richness, rank-abundance curves).
- Ecological knowledge of how species interact directly and indirectly and the enormous variation in life-history strategies among species.
- Experience in the basics of ecological modelling and its use in predicting population growth.
- An appreciation of the complementary approach between macroecology and small-scale experimentation for restoration and biodiversity conservation.
- An awareness of the importance of invasive species as a threat to the conservation of native ecosystem structure and function.
- The ability to use various techniques of field-based data collection and with confidence in several different systems (e.g. woodland vegetation, the intertidal zone).
- Experience with linking several different statistical techniques to the analysis of ecological data.

Contribution to course aims and graduate attributes

1. DISCIPLINARY KNOWLEDGE AND ITS APPROPRIATE APPLICATION

Lectures provide students with important foundational information about the structure and function of ecosystems in an evolutionary context. This broad knowledge base covers ecological
theory and practice in terrestrial and marine systems and encourages students to consider the continually-changing nature of the natural environment as a result of human activities. Students are assessed on their understanding of this foundational information in the Final Examination in a series of multiple-choice questions combined with two essay questions which test the students’ ability to link disparate ideas covered in the lectures.

Field Practicals in Ecology provide an arena for students to apply this disciplinary knowledge directly to real-world scenarios. Students gain hands-on field experience with a range of different plant and animal communities in the Sydney region, complementing the knowledge gained from Lectures. Within-semester Assessments based on the Field Practicals and their accompanying Laboratory Practicals test the students’ competency in analysing their field-collected data and interpreting the outcomes in an ecological and evolutionary context.

2. PROFESSIONAL SKILLS AND THEIR APPROPRIATE APPLICATION

Technical skills for ecological data collection and analysis are acquired continually throughout the semester and include: plant and animal sampling and surveys; bird, plant and invertebrate identification; the application of fundamental statistical techniques; data handling using both manual calculations and computer programs; and graphical literacy skills. Students pose a series of questions about specific environmental issues and collect and explore scientific evidence as part of a team in the Field and Laboratory Practicals. Students are also directly advised of the OH&S issues related to working in field and laboratory situations and are encouraged to perform the required tasks safely and effectively.

Students’ grasp of the technical skills – and their ability to evaluate and discuss their findings in a meaningful ecological context – are assessed in within-semester Assessments which require presentation of data, their analyses and interpretations of the emergent patterns. The Assessments are feedback-based, allowing students to continually improve their understanding of fundamental ecological principles as well as to refine their scientific writing skills.

3. THE ABILITY TO BE A LIFELONG LEARNER

The intellectual and practical underpinnings of this subject can be applied by students to their surroundings and everyday life. Scientific theories continually shift as our understanding of the natural world deepens. This subject explores the changing and progressing nature of ecological theory over time, underscoring the importance of continued learning in the field of ecology. Students are also encouraged to use their initiative when discussing patterns emerging from their data collection in the Field Practicals, with opportunities provided for deeper thinking beyond the simplest explanation. The ability to use initiative is assessed with targeted questions in the within-semester Assessments. This subject promotes the ability to be a Lifelong Learner about the natural world with a continued desire to understand global ecosystem functioning and the impact of human activities on biodiversity.

4. COMMUNICATION SKILLS

Ecology has four written Assessment tasks, set to a professional report-writing standard expected in many scientific careers. Written work is critiqued by staff and feedback is provided to allow students to develop further their communication skills. Students are also encouraged to seek and
make use of ecological literature throughout the course. The Consultation Practicals are vital and provide students with the opportunity to interact with experienced ecologists and fellow students to discuss scientific methodology and theoretical ideas related to the course. All topics related to the fieldwork and Laboratory Practicals are explored with students on request.

Teaching and learning strategies

Ecology is presented as a 2-hr Lecture (face-to-face) and a 3-hr Practical (involving field or laboratory work) each week of the semester. There are five Assessments in this subject. Assessments 1 to 4 are written assignments that are submitted during the semester and test Practical-based knowledge. Assessment 5 is a Formal Examination consisting of 40 multiple-choice questions and two one-page essay questions covering Lecture material.

Content

Students are introduced to the fundamental ecological principles underpinning the structure and function of ecosystems. Theoretical and empirical examples are provided using a broad cross-section of organisms and ecosystems to demonstrate unifying ecological themes.

Assessment

Assessment Item 1: Assessment 1
Objective(s):

Students to demonstrate an understanding of the ecological issues addressed in the Field Work Practicals; in particular, links between features of the environment and the distribution, abundance and richness of species across spatial and temporal scales. Students will use a range of methods to describe ecological communities.
Weighting:

15% Criteria:

Correct answers to questions; numerical proficiency; critical thinking; acquisition of broad knowledge of subject material via reading outside the prescribed text; experimental design; data handling; statistical analysis; clarity of writing; neatness of presentation.

Assessment Item 2: Assessment 2
Objective(s):

Students to demonstrate an understanding of the ecological issues addressed in the Field Work Practicals; in particular, links between features of the environment and the distribution, abundance and richness of species across spatial and temporal scales. Students will use a range of methods to describe ecological communities.
Weighting:

15% Criteria:
Correct answers to questions; numerical proficiency; critical thinking; acquisition of broad knowledge of subject material via reading outside the prescribed text; experimental design; data handling; statistical analysis; clarity of writing; neatness of presentation

Assessment Item 3: Assessment 3
Objective(s):

Students to demonstrate an understanding of the ecological issues addressed in the Field Work Practicals; in particular, links between features of the environment and the distribution, abundance and richness of species across spatial and temporal scales. Students will use a range of methods to describe ecological communities.
Weighting:

15% Criteria:

Correct answers to questions; numerical proficiency; critical thinking; acquisition of broad knowledge of subject material via reading outside the prescribed text; experimental design; data handling; statistical analysis; clarity of writing; neatness of presentation

Assessment Item 4: Assessment 4
Objective(s):

Students to demonstrate an understanding of the ecological issues addressed in the Field Work Practicals; in particular, links between features of the environment and the distribution, abundance and richness of species across spatial and temporal scales. Students will use a range of methods to describe ecological communities.
Weighting:

15% Criteria:

Correct answers to questions; numerical proficiency; critical thinking; acquisition of broad knowledge of subject material via reading outside the prescribed text; experimental design; data handling; statistical analysis; clarity of writing; neatness of presentation

Assessment Item 5: Final Examination
Objective(s):

To test disciplinary (ecological) knowledge in the context of biodiversity and ecosystem conservation and management.

Weighting:

40% Criteria:

Correct answers to multiple-choice questions.

Minimum requirements
Students are expected to attend all Lectures. Practicals are compulsory and attendance is taken at each Practical with an expectation that at least 80% of the Practicals are attended (with the exception of the Consultation Practicals which are not compulsory). If both the field and laboratory Practicals for a given Assessment item are not attended, that Assessment will not be marked as the Practicals require participation and data collection/analysis. Students are expected to submit/sit all Assessments. In order to pass this subject, students must receive at least 40% in their final exam. If 40% is not reached, an X grade fail may be awarded for the subject, irrespective of an overall mark greater than 50.

Required texts

The following text-book will be in Closed Reserve in the UTS Library during the semester and it can be purchased from the Co-op Bookshop:


Recommended texts

The following text-books will be in Closed Reserve in the UTS Library during the semester; it is not essential to purchase these text-books:


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91270 Plant Physiology and Ecophysiology

UTS: Science: Environmental Sciences
Credit points: 6 cp
Result type: Grade and marks

Requisite(s): (91123 Biocomplexity OR (91101 Cells, Genetics and Evolution AND 91151 Plants, People and the Environment AND 65212 Chemistry 2))

Handbook description

This subject introduces the key concepts, processes and techniques required to understand the basics of the physiology of plants and the interaction of the abiotic environment with plants in the field (ecophysiology). It is taught using a combination of lectures, practical lab work and group project work. Topics to be covered include a selection from the following: carbon gain; long-distance transport in the phloem; uptake, movement and control of water fluxes in the soil-plant-atmosphere continuum; behaviour and physiology of stomata; nitrogen fixation of higher plants; ion uptake by plant roots; comparative ecophysiology of plants in contrasting environments; physiology of plants exposed to stress.

Subject objectives/outcomes

Page | 18
This subject is designed to investigate plant structure and function at the individual plant level and then apply this understanding to plant strategies and adaptations in different environments. By the end of the course, students will be expected to:

- understand how plant structure relates to function;
- understand how and why water and ions are transported through plants;
- understand plant strategies in the capture of light;
- recognize different methods plants use to sequester nutrients;
- understand different plant strategies in the utilization of nutrients;
- understand and give examples of plant adaptations to different environments and disturbances; like climate change scenarios and their impacts on plant physiology;
- have developed practical skills in plant physiological techniques;
- be able to complete a major project investigating the effects of environmental stress on plant individuals through implementing an experimental design, taking replicate samples, analyzing results and submitting a comprehensive, referenced report.

**Contribution to course aims and graduate attributes**

The subject content contributes to the graduate profile through the following components:

- Disciplinary knowledge and its appropriate application in understanding the underlying theory of plant physiology and plant responses to environmental factors
- An enquiry-oriented approach through the execution of a group self-initiated project
- Professional skills and their application in applying the techniques and skills gained through practical classes to the project
- Communication skills through presentation of project proposal and written communication of practical reports and project report
- Initiative and innovative ability in design of the experiment for the project

**Teaching and learning strategies**

This subject involves attendance at: 2 hours of lectures per week and 3 hours of formal practical classes for 6 weeks followed by individual/group project investigations by student groups

**Content**

**Plant structure and function**

- Plant cell and tissue types including ground/support tissues, dermal tissues, stems, roots; secondary growth
- Stomatal anatomy and morphology, and movement of stomata

**Plant water relations**

- Properties of water and water potential and its measurement
• Water movement across cell membranes, in soil and plant, transpiration, cavitation & embolism

Photosynthesis

• Capture of light by plants - chlorophyll molecules, chloroplast structure, PSII and PSI structure and function, the Z-scheme of photosynthesis, electron and proton transport
• ATP synthesis and carbon fixation, Rubisco structure and function
• A comparison of C3, C4, CAM and SAM pathways of photosynthesis
• Chlorophyll fluorescence, non-photochemical quenching, photoprotection vs. photodamage
• Photosynthesis in extreme environments, photosynthesis in symbiotic relationships

Plant water relations and ion transport

• Membrane transport, passive and active ion transport
• Pathways of translocation in the phloem, source to sink, loading and unloading; transport of signaling molecules

Plant adaptations to environments

• Ecohydrology: contribution of vegetation to the water cycle, plant water use and impacts of biotic and abiotic factors; investigation of a model addressing plant mechanisms and water use in the Australian environment.
• Climate change and plant physiology: projected changes to climatic patterns and community distributions; direct effects of CO2 enrichment on plant growth.
• Leaf energy balances

Assessment

Assessment Item 1: Practical Reports
Objective(s):

h; III, IV
Weighting: 5% each, four to hand-in, total of 20%
Criteria:

Assessment criteria as indicated in the practical notes and hand-out material

Assessment Item 2: Project Report
Objective(s):

h, i; II, II, IV, V
Weighting: 30%
Criteria:

Assessment criteria as indicated in guide notes and lecture

Assessment Item 3: Final Examination
Objective(s):
Page | 20
Minimum requirements

Students must obtain at least 40% of the marks available for the final examination in order to pass this subject. If 40% is not reached, an X grade fail may be awarded for the subject, irrespective of an overall mark greater than 50.

Attendance at all practical sessions and project data sessions is compulsory. Generally a pass level in all assessment items is required to pass this subject overall. You must achieve a satisfactory mark in each of the items above of the assessment schedule in order to be eligible for an overall pass in this subject. A satisfactory mark is normally considered to be 40% or more of the maximum mark available for each item. A pass in this subject also requires a cumulative mark of 50% or more when the individual marks for the items are added together.

Students are also normally expected to attend all lectures and must attend at least 80% of the practical sessions (Faculty rules), including the project and field work.

Required texts


References

Plant Physiology/Ecophysiology:

Experimental Design and Analysis

Scientific writing

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91161 Cell Biology and Genetics

UTS: Science: Medical and Molecular Biosciences
Credit points: 6 cp
Result type: Grade and marks

Anti-requisite(s): 91101 Cells, Genetics and Evolution AND 91313 Biomolecules: Structure and Function

Handbook description

This subject is concerned with the cellular nature of biological material and students engage in processes of scientific inquiry in cell biology and genetics. The subject introduces the student to the basic concepts of cell biology, cell structure and function and the underlying genetic code. The different structure, composition and function of prokaryotes, eukaryotes and archaea are covered. The subject covers the structure and properties of cell membranes and transport across them, as well as the chemical changes (both synthetic and degradative) that occur in cells and the ways in which cells obtain, store and manipulate energy. Processes of cell communication, including cell recognition and adhesion, and the ways in which cells respond to external signals are also covered.

Students are introduced to the methods used to investigate cellular structure and the functional significance of their sub-cellular organisation. Cell growth and division along with stages of the cell cycle and key molecules and mechanisms involved in its regulation, along with mitosis and meiosis are discussed. The topics of cell proliferation, cell differentiation and apoptosis (programmed cell death) are covered. In this subject students learn to undertake independent research and participate in the scientific peer review process.

Subject objectives/outcomes

Upon completion of this subject, students will be expected to:

- Have developed an appreciation of the role of science in society, and the importance of applying the concepts of cell biology and genetics in order to understand and contribute to public debates in biological and health issues.
- Have acquired a fundamental understanding of the major concepts in cell biology and genetics, and the experimental approaches taken in their study.
- Be able to write clear and well-argued descriptions of these topics, based on the course material, textbook and research and review articles.
- Be able to undertake basic research of a topic in cell biology and genetics by accessing and reviewing published research literature, critically synthesizing the gathered information, discuss their findings and communicate these to others.
- Be able to design, perform and analyse simple experiments in cell biology and genetics.

Contribution to course aims and graduate attributes

This subject contributes to the personal, professional and intellectual development of students by encouraging:
1. Disciplinary knowledge and its appropriate application
An understanding of the nature, practice & application of the chosen science discipline, 
Fundamental disciplinary and technical knowledge in cellular biology and genetics.

2. An Enquiry-oriented approach
Encompasses problem solving, critical thinking and analysis attributes, and an understanding of 
the scientific method knowledge acquisition. 
o An appreciation of critical and independent thinking by objective criticism, logical thought and 
problem solving that are considered to be the foundations of the scientific method. 
o The gathering, evaluating and applying of information relevant to a scientific problem and an 
appreciation of the existence of different sources and types of information, such as peer-reviewed 
publications, databases, research and review articles, textbooks, catalogues and technical 
reference books. This is achieved by completion of and assessment for the poster assignment and 
library tutorials.

3. Professional skills and their appropriate application
The ability to acquire, develop, employ and integrate a range of technical, practical and 
professional skills, in appropriate and ethical ways within a professional context, autonomously 
and collaboratively and across a range of disciplinary and professional areas. 
e.g. Time management skills, personal organisation skills, teamwork skills, computing skills, 
laboratory skills, data handling, quantitative and graphical literacy skills. 
o The development and application of numerical and analytical skills at a level appropriate to 
scientific practice for a stage 1 undergraduate student through completion of and assessment for 
laboratory datasheets and tutorial problems. 
o An understanding of the observational and experimental character of science and development 
of basic skills in field and laboratory techniques and experimental design by completion of and 
assessment for the laboratory component of the subject. 
o Management of work-load required for scientific based practice and professional work by 
attendance and completion of the set tasks for this subject.

4. Engagement with the needs of Society
An awareness of the role of science within a global culture and willingness to contribute actively 
to the shaping of community views on complex issues where the methods and findings of science 
are relevant. 
o An appreciation of the impact and central role of science in society. Study of the life and 
contribution to science by Charles Darwin is used as an example.

5. Communication skills
A fundamental understanding of the different forms of communication - writing, reading, 
speaking, listening, as well as, visual and graphical - within science and beyond and the ability to 
apply these appropriately and effectively for different audiences. 
o A level of spoken and written communication skills in the presentation of scientific research 
and data commensurate with the expected foundation level of a stage 1 undergraduate student by
engaging in and being assessed for the research, preparation and oral presentation of a scientific poster.

**Teaching and learning strategies**

Face-to-face classes will incorporate a range of teaching and learning strategies including lectures, short presentations, videos, simulations, discussion of readings and case studies and student laboratory group work. These will be complemented by independent student reading, written assignment and participation in online Blogs, discussions and quizzes.

Throughout the semester you will be expected to spend 10-11 hours per week on this subject. This will consist of approximately 6 hours class time and the remaining time in revising new material, preparation for the following week and for completion of assessment tasks.

Students are expected to conduct themselves in an ethical way and not engage in cheating or plagiarism. Students are expected to monitor UTSOnline on a regular basis (every 3 - 4 days) for information or changes to scheduling, assessment tasks, lecture and laboratory times and locations, and to participate in the online forums and/or Blogs.

**Content**

1. **Cell structure and cellular processes including:**
   - membrane transport,
   - cellular communication,
   - energy and metabolism,

2. **Properties of Biomolecules including the structure, function and techniques for quantitative measurements of:**
   - Carbohydrate
   - Protein
   - Lipid
   - Nucleic acid

3. **Understanding of genetics including:**
   - Concept of genetic code, chemical structure and regulation through transcription and translation.
   - Cell division (meiosis and mitosis), differentiation and cell cycle
   - Theories of inheritance, including population genetics, evolutionary relationship and Mendelian theories
   - Diseases pertaining to inherited diseases as well as diseases relating to gene expression or mutation

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Assessment

Assessment Item 1: Online Quiz 1
Objective(s):

Assessment of students’ understanding of the principal concepts covered in the cell biology and genetics, and the experimental approaches used in their study, provide feedback to students, on their understanding of the material presented over the specified weeks.
Weighting: 10%
Criteria:

Ability to correctly answer multiple choice questions based on lecture and practical session material covered during specified weeks.

Assessment Item 2: Online Quiz 2
Objective(s):

Assessment of students’ understanding of the principal concepts covered in the cell biology and genetics, and the experimental approaches used in their study, provide feedback to students, on their understanding of the material presented from over the specified weeks.
Weighting: 10%
Criteria:

Ability to correctly answer multiple choice questions based on lecture and practical session material covered during specified weeks.

Assessment Item 3: Practical Reports/Datasheets
Objective(s):

Testing the student’s ability to write clear descriptions of the topics covered in each practical session. Be able to perform and analyse simple experiments in cell biology and genetics.
Weighting: 30%
Criteria:

Ability to correctly answer short-answer questions, correctly perform and demonstrate workings out of set calculations, draw and label graphs, record, interpret and analyse data collected for each experiment.

Assessment Item 4: Poster
Objective(s):

Assessing the student’s ability to undertake basic research of a topic in cell biology and genetics, discuss their findings and communicate these to peers and instructors/demonstrators.
Weighting: 10%
Criteria:

Ability to source relevant published information, write clear and well-argued descriptions of the topic, prepare and present a poster according to the guidelines, give a 5 minute oral presentation of the research topic displayed on the poster. See poster assignment guidelines and checklist for further details (available on UTSOnline).
Assessment Item 5: Final Examination

Objective(s):

Theoretical assessment of student’s understanding of the major concepts in cell biology and genetics and the experimental approaches taken in their study.

Weighting: 40%

Criteria:

Ability to correctly answer multiple choice questions

Minimum requirements

Students are expected to attend all lectures and laboratory sessions. For laboratory sessions, a record of attendance will be taken.

Check the assessment schedule for dates and content of the Online quizzes and assignment. You need to check in advance each week whether you have an upcoming quiz or assessment item - ignorance of a scheduled assessment date is NOT an acceptable excuse for poor results and will NOT be taken into account.

Any assessment task worth 40% or more requires the student to gain at least 40% of the mark for that task. If 40% is not reached, an X grade fail may be awarded for the subject, irrespective of an overall mark greater than 50.

In order to pass this subject the sum total of all assessment components must be greater than or equal to 50%. A satisfactory level must be achieved in all sections, including the final exam.

Recommended texts


Other resources

Alternative Text:


Additional Text:


35231 Differential Equations

UTS: Science: Mathematical Sciences
Credit points: 6 cp
Result type: Grade and marks

Requisite(s): ((35102 Introduction to Analysis and Multivariable Calculus OR 33230 Mathematical Modelling 2 OR 33290 Statistics and Mathematics for Science OR 33401 Introductory Mathematical Methods) AND 35212 Computational Linear Algebra)
These requisites may not apply to students in certain courses. See access conditions.

Handbook description

Differential equations arise in contexts as diverse as the analysis and pricing of financial options, and the design of novel materials for telecommunications. In this subject students develop familiarity with the theory of differential equations, applications of this theory and some of the main computational techniques used in the solution of differential equations. Topics include existence and uniqueness of solutions; method of Frobenius; variation of parameters; the Taylor and Runge-Kutta methods for initial value problems; Fourier series; solving partial differential equations and boundary value problems by separation of variables, transform methods and finite difference methods.

Subject objectives/outcomes

By the end of this subject, students should be able to demonstrate:

- proficiency in finding solutions various types of differential equations or systems of differential equations and the ability to judge which method is applicable or most appropriate for finding the solution of a differential equation
• proficiency in the mathematical techniques which may be needed in solving differential equations. These include using variation of parameters, finding series solutions, separation of variables and Fourier series expansions and calculating and inverting Laplace transforms
• an understanding of the various theoretical results which justify the use of the above skills
• the ability to write an exposition on selected topics in the subject
• the ability to summarise the main strategies of a given proof and conversely to construct a proof from verbal explanations of the methods
• the ability to critically analyse and comment upon various stages in a given proof
• the ability to model physical problems in terms of differential equations in other areas of mathematics and its applications
• an appreciation of the relationship of differential equations to other areas of mathematics and its applications
• the ability to see the subject as a coherent whole and not merely as a collection of results and techniques.

Contribution to course aims and graduate attributes

This subject is expected to contribute to the following graduate profile attributes
1. Disciplinary knowledge and its appropriate application
An understanding of the nature, practice & application of analysis to practical and theoretical problems which arise in a wide range of fields, from finance to physics,

2. An inquiry-oriented approach
An understanding of the scientific method of knowledge acquisition. Encompasses problem solving, critical thinking and analysis attributes, and the ability to discover new understandings

3. Professional skills and their appropriate application
The ability to acquire, develop, employ and integrate a range of technical, practical and professional skills, in appropriate and ethical ways within a professional context, autonomously and collaboratively and across a range of disciplinary and professional areas.
E.g. Time management skills, personal organisation skills, teamwork skills, computing skills, laboratory skills, data handling, quantitative and graphical literacy skills.

7. Initiative and innovative ability
An ability to think and work creatively, including the capacity for self-starting, and the ability to apply scientific skills to unfamiliar applications.

Teaching and learning strategies

The material will be presented weekly over three hours of lectures. These will be supplemented by a weekly one hour tutorial in which exercises will be carried out by the student to reinforce and broaden their understanding of the materials from lectures. There will also be assignments which will present aspects of the subject which depend on the material presented in lectures, but may require independent work to be fully mastered. Reading the recommended texts and doing exercises from the texts plays an essential part in the study of this subject. It is expected that the student will spend 6 hours per week outside class in the study of the subject.
Content

- Laplace Transform Methods
- Partial Differential Equations and Fourier Series
- Applications of partial differential equations to problems in science and finance.

Assessment

Assessment item 1: Assignment 1
Objective(s):

Solve elementary differential equations by variation of parameters, changes of variables and power series methods.
Weighting: 10%
Assessment criteria:

accuracy of proofs and calculations, Clarity of answers, Correctness of results

Assessment item 2: Assignment 2
Objective(s):

Solve differential equations using Laplace transform methods and solve partial differential equations using Fourier series methods. Apply numerical methods to solve some type of differential equation.
Weighting: 10%
Assessment criteria:

accuracy of proofs and calculations, Clarity of answers, Correctness of results

Assessment item 3: Class Test
Objective(s):

Apply and prove results from first eight weeks of subject
Weighting: 20%
Assessment criteria:

accuracy of proofs and calculations, Clarity of answers, Correctness of results

Assessment item 4: Final Exam
Objective(s):

Demonstrate understanding of and ability to use and prove results from the subject as a whole.
Weighting: 60%
Assessment criteria:

accuracy of proofs and calculations, Clarity of answers, Correctness of results
Minimum requirements

Student must obtain at least 40% of the marks available for the final examination in order to pass this subject. If 40% is not reached, an X grade fail may be awarded for the subject, irrespective of an overall mark greater than 50.

A final overall mark of 50 Percent or more is required to pass the course. The final result is calculated as max(E,A), where E is the exam mark out of 100, and A=0.6E+C+B and C is the class test mark out of 20 and B is the total mark out of 20 for the two assignments.

Note that a supplementary exam will not be offered to any failing student if the student does not obtain a score of at least 40 percent of the possible marks available in the final exam. That is, no supplementary will be offered unless E>= 40.

Recommended texts

The following textbooks are useful, but not required.


The library has dozens of useful textbooks on this subject.

References
Appendix II: Working Budget

SMC Study Abroad Program, 
University Technology Sydney, Australia

Working Budget for Spring 2014

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<th>Per Student</th>
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Enrollment Table-Fall 2012 estimate of students going

| Australia | 6 |          |

SMC Exchange Program with University Technology Sydney, UTS
SMC students will pay SMC tuition fees only and will pay housing costs and health insurance directly to UTS.

UTS students will pay UTS tuition abroad and will pay SMC housing costs, health insurance, and student activity fee.