

**University of Windsor
Program Development Committee**

*5.11 **Earth and Environmental Sciences - New Course Proposal**

Item for: **Approval**

MOTION: That the following course addition be made*:
66-112 Introduction to Planetary Science

**Subject to the approval of expenditures required.*

Rationale/Approvals:

- The new course proposal has been approved by the AAU Council and Faculty Coordinating Council.
- See attached.

PROGRAM DEVELOPMENT COMMITTEE NEW COURSE PROPOSALS FORM "D"

TITLE OF THE PROGRAM/CERTIFICATE: Bachelor of Science in Environmental Science
DEPARTMENT/SCHOOL: Earth & Environmental Sciences
FACULTY: Science

Proposed change(s) effective as of: Winter 2015

A. NEW COURSE PROFILE

Course # and Title: 66-112 Introduction to Planetary Science

Calendar Description

Calendar descriptions should be written in the third person and should provide a general outline of the course material. Where appropriate, examples of topics or themes, which might be covered in the course, should also be provided.

An introduction to the origin of the Universe and Solar System. Topics include: the Big Bang theory; origin and organization of matter; and formation of galaxies, nebulae, stars, and planetary systems. The focus is on the geological features of planets, moons, asteroids, and comets. Coverage includes historical perspectives and current theory on astronomy, measurement of the ages of the Universe and Solar System, space exploration, Moon and Mars missions, analyses of NASA satellite images, the origin and evolution of life in the Solar System, and the search for possible extra-terrestrial life and intelligence in the Universe. (This course is designed for non-Science majors.) (3 lecture hours a week.)

Other Course Information

Please complete the following tables.

Credit weight	Total contact hours	Delivery format				Breakdown of contact hours/week			
		In-class	e-learning	Distance	Other flexible learning delivery <i>[please specify]</i>	Lecture	Tutorial	Lab.	Co-op/ practicum
3	36	36				36			

Pre-requisites	Co-requisites	Anti-requisites	Cross-listed with:	Required course	Optional course	Replacing old course*** <i>[provide old course number]</i>
					x	

[*Replacing Old Course: this does not mean that the former course will be deleted from the calendar. If it is to be deleted, a Form E must be completed.]**

Will students be able to obtain credit for the new course and the course(s) that it is replacing?

N/A

B. RATIONALE

B.1 Course Goal(s)

Please provide a statement about the purpose of the course within the program of study or as an option.

This course will inform non-science students of the current state of knowledge on the origin, structure, and evolution of the Universe, the Solar System, and Earth. The course differs from other offerings (e.g., 64-190 and 64-191) in providing a perspective that focuses on the geological and biological aspects of planetary and stellar origin and evolution, rather than theoretical physics. The course has been designed to satisfy the academic needs of non-science students. Students will obtain foundation knowledge in the nature, origin, and evolution of matter (e.g., elements, molecules, rocks) from the Big Bang to formation and organization of

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galaxies, nebulae, stellar systems, planets, and life. Students will obtain introductory knowledge in a diversity of scientific themes (e.g., physics, chemistry, geology, biology), which is targeted to increase awareness in, and appreciation of the importance and influence of Earth in all of our lives and our place in the Solar System. Students will gain insights into how space exploration has shaped our cosmic perspective.

B.2 LEARNING OUTCOMES (QAF section 2.1.1, 2.1.3, and 2.1.6)

Please complete the following table. State the specific learning outcomes that make up the goal of the course (what will students know and be able to do at the end of this course?) and link the learning outcomes to the Characteristics of a University of Windsor Graduate outlined in “To Greater Heights” by listing them in the appropriate rows.

Please note that a learning outcome may link to more than one of the specified Characteristics of a University of Windsor Graduate, and that a single course might not touch on each of the Characteristics. Each University of Windsor program should produce graduates that are able to demonstrate each of the nine characteristics approved in To Greater Heights.

Information on learning outcomes is appended to this form (Appendix A). Proposers are also strongly encouraged to contact the Office of the Vice-Provost, Teaching and Learning or the Centre for Teaching and Learning, for assistance with the articulation of learning outcomes.

Learning Outcomes <i>This is a sentence completion exercise.</i>	Characteristics of a University of Windsor Graduate
<u>At the end of this course, the successful student will know and be able to:</u>	<u>A U of Windsor graduate will have the ability to demonstrate:</u>
A. <ul style="list-style-type: none"> • Explain current theory on the origin of the Universe, the Solar System, Earth, and our place in the cosmos • Name and describe the elements of our Solar System • Explain the origin and organization of matter in the early Universe • Describe the internal structure of Earth and explain how Earth’s internal processes affect our daily lives • Explain current theory and knowledge on planetary and stellar accretion • Explain current theory and knowledge on origins, explosions and extinctions of life throughout Earth history • Explain other relevant concepts (e.g., space exploration, search for extraterrestrial life) • Explain natural laws and processes and how they have contributed to structures in space and time 	A. the acquisition, application and integration of knowledge
B. <ul style="list-style-type: none"> • Explain how scientific research is used to incrementally improve our understanding of Earth, the Solar System, and the Universe through application of the Scientific Method • Explain current theories on the origin of the Universe and demonstrate how these theories have evolved through time • Explain the problems with mythologies that have been proposed to explain the natural world • Explain how matter has evolved from subatomic particles to galaxies and complex life forms • Describe how ‘natural laws’ are defined and tested 	B. research skills, including the ability to define problems and access, retrieve and evaluate information (information literacy)
C. <ul style="list-style-type: none"> • Explain how scientific methodology is used to critically 	C. critical thinking and problem-solving skills

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Learning Outcomes <i>This is a sentence completion exercise.</i>	Characteristics of a University of Windsor Graduate
At the end of this course, the successful student will know and be able to:	A U of Windsor graduate will have the ability to demonstrate:
evaluate observations, measurements, and hypotheses pertaining to galaxies, stars, planets, moons, asteroids and comets <ul style="list-style-type: none"> • Distinguish between misleading 'common sense' concepts and the reality of natural systems • Communicate personal opinions regarding the adequacy of scientific knowledge pertaining to the place of humankind in the Universe 	
D. <ul style="list-style-type: none"> • Read and critically evaluate current theory and knowledge regarding the Universe • Define and apply the principle equations describing the natural world • Explain how planetary laws are defined, galactic distances measured, and how energy and matter are mathematically related 	D. literacy and numeracy skills
E. <ul style="list-style-type: none"> • Describe and explain the influence of large-scale planetary processes in our daily lives 	E. responsible behaviour to self, others and society
F. <ul style="list-style-type: none"> • Describe and critically examine fundamental concepts regarding the origins and evolution of Earth, the Solar System, and the Universe during in-class group discussion 	F. interpersonal and communications skills
G. <ul style="list-style-type: none"> • Not applicable 	G. teamwork, and personal and group leadership skills
H. <ul style="list-style-type: none"> • Not applicable 	H. creativity and aesthetic appreciation
I. <ul style="list-style-type: none"> • Not applicable 	I. the ability and desire for continuous learning

B.3 Demand for Course

Please provide as much information on projected enrolment as possible.

Projected enrolment levels for the first 5 years of the new course.	Year 1	Year 2	Year 3	Year 4	Year 5
	100	200	200	200	200

What will be the impact of offering the new course on enrolments in existing courses in the program or Department?

This course can increase the enrolment in the Department of Earth & Environmental Sciences by increasing the interest and awareness about our planet and environment, which will improve the visibility and raise the profile of the department. It is anticipated that this course will be popular due to the subject matter and the mode of delivery (i.e., lecture only) and it is anticipated that it will be transitioned into a blended or distance learning course depending on the level of interest.

B.4 Student Workload

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*Provide information on the expected workload per week of a student enrolled in this course.
NOTE: Student workload should be consistent with the credit weight assigned to the course.*

Average number of hours per week that the student will be expected to devote to:

3	Lectures
	Tutorials
	Labs
	Practical experience
	Independent Study
3	Reading for the course
	Work for assessment (essays, papers, projects, laboratory work)
	Meeting with others for group work/project assignments
2	Studying for tests/examinations
	Other: <i>[specify]</i>

How does the student workload for this course compare with other similar courses in the department/program area? The workload for this course is comparable with other courses that are offered in EES that are also targeted at non-science students or science students seeking an optional course that provides subject matter that is relevant to their degree.

C. RESOURCES

C.1 Available Faculty and Staff Resources (QAF sections 2.1.7, 2.1.8, 2.1.9 and 2.1.10)

Describe all faculty and staff resources (e.g., administrative, teaching, supervision) from all affected areas/departments currently available and actively committed to support the new course.

Elimination of the remaining geology courses at the end of the Winter 2014 term will free up faculty to teach this course without any impact on departmental resources. All other resources formerly dedicated to the geology program were previously transitioned to the environmental science program.

C.1.1

Provide an assessment of faculty expertise available and committed to actively support the new course.

A faculty member within the department studies the early evolution of the Earth and has published over 60 research articles on this topic. He is familiar with the theories and processes on the origins of the Universe and Solar System.

C.1.2

Describe the area's expected reliance on, and the role of adjunct, limited-term, and sessional faculty in delivering the new course.

There will be no need to rely on adjunct, limited-term, or sessional faculty member to deliver the new course.

C.2 Resource Implications for Other Campus Units (MTCU sections 3 and 4)

Describe the reliance of the proposed new course on existing resources from other campus units, including for example:

- *faculty teaching,*
- *equipment or facilities outside the proposer's control,*
- *external resources requiring maintenance or upgrading using external resources*

Provide relevant details.

There will be no need for external resources.

C.3 Anticipated New Resources (QAF sections 2.1.7, 2.1.8 and 2.1.9; MTCU section 4)

List all anticipated new resources originating from within the area, department or faculty (external grants, donations, government grants, etc.) and committed to supporting the revisions to this program.

No new resources will be required.

C.4 Planned Reallocation of Resources and Cost-Savings (QAF section 2.1.7 and 2.1.9; MTCU section 4)

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Identify all opportunities for

- internal reallocation of resources and
- cost savings

identified and pursued by the area/department in support of the new course. (e.g., streamlining existing programs and courses, deleting courses, etc.)?

The geology program in the Department of Earth and Environmental Sciences has been terminated. By deleting these courses, resources may be reallocated to this new course, which will help improve the visibility of the department.

C.5 Additional Resources Required – Resources Requested (QAF section 2.1.7 and 2.1.9)

Describe all **additional faculty, staff and GA/TA resources** (in all affected areas and departments) required to offer the new course.

Faculty: N/A

Staff: N/A

GA/TAs: Approximately 4 to 5 teaching assistants will be needed on a part time basis for proctoring and marking of exams, which will be conducted following previously established practices within the department.

C.5.1

Describe all **additional institutional resources and services** required by all affected areas or departments to offer the new course, including library, teaching and learning support services, student support services, space and facilities, and equipment and its maintenance.

Library Resources and Services: Books on reserve

Teaching and Learning Support: Course website

Student Support Services: None required

Space and Facilities: No additional space and resources are required.

Equipment (and Maintenance): Several documentary DVDs (e.g., Discovery Channel, PBS) will be required for illustrative purposes