

# Earth Sciences 1086F: Origin and Geology of the Solar System

## Summer 2019

**Instructor:** Dr. Elizabeth Webb, Department of Earth Sciences.

I encourage you to post questions about the course content in the online Forums. If you need to contact me about something personal, please email at [ewebb5@uwo.ca](mailto:ewebb5@uwo.ca) and put the course code (1086F) in the subject line. Please read the syllabus before asking or posting a question.

### Course Description

This half-course will explore the Solar System; we will look at our star (the Sun), the planets and their satellites, and other bodies such as asteroids and comets. We will consider the hypotheses and theories that attempt to explain their origins. We will see how our knowledge of Earth's geology applies to other planetary bodies in the Solar System. We will end the course with a discussion of potential extraterrestrial life. As technology improves and as more and more space vehicles probe beyond Earth, knowledge expands dramatically.

This course emphasizes qualitative approaches to the topics included, thus is appropriate for all students, irrespective of backgrounds. Course content is available *online only* (no textbook). It is your responsibility to maintain access to the internet for the duration of the course.

### Course Objectives

- The primary goal of the course is to gain an appreciation of what we know about the Solar System, and how we know what we know.
- We will learn to recognise the processes of evolution of a star-planet system, and we will see that the evolution we know best – that of Earth – may not apply well elsewhere.
- We need to understand the logic of a scientific study: from observation and gathering of evidence to hypothesis and, eventually, refined theory.
- We will learn to write scientific reports; an assigned topic will be researched and presented in scientific format.

### Important dates

- Essay submission #1 deadline: **Friday May 31<sup>st</sup>, 3:00 pm**
- Mid-term test: **Saturday, June 15, 9:00 am**
- Quizzes 1-3b: **Saturday, June 15, 11:55pm**
- Revised essay submission #2 deadline: **Friday July 12<sup>th</sup>, 3:00 pm**
- Deadline to post in the Forums, read required forum posts and participate in polls: **Thursday July 25<sup>th</sup>, 3:00 pm**
- Quizzes 4-7: **Friday July 26<sup>th</sup>, 11:55 pm**
- Final exam set by the Registrar's office. Final exam date will be set by the Registrar's office (UWO's exam period runs July 29 – August 1). Please check the exam period on the [distance studies web page](#) before making any travel arrangements!

## Method of Evaluation

- 25% Mid-Term 2 hour written examination  
**Midterm Exam is scheduled for Saturday, June 15, 9:00 am.**
  - Fill-in-the-blank, multiple choice, and short-answer questions.
  - *This covers Units 1, 2 and 3 inclusive (to the end of Chapter 11)*
  - Make-up midterm will be held on Wednesday June 19<sup>th</sup> @ 6 pm  
*You can only take the make-up with permission from an academic counsellor.*
  
- 25% End-of-Term 2 hour written examination  
**Date, time and location to be determined by the Registrar's office**
  - Fill-in-the-blank, multiple choice, and short-answer questions.
  - *This covers the second half of the course: Units 4, 5, 6 & 7 inclusive (to the end of Chapter 19). The exam is not cumulative.*
  
- 35% Scientific Report (Assigned Research Topic). Submitted in 2 parts: *See the Assignment Information provided on OWL.* Because this is an essay course, the written assignment must be completed and you must achieve of grade of at least 50% on the second version to pass the course.
  - 17.5% Submission of first version : **Due Friday May 31<sup>st</sup>, 3:00 pm**
  - 17.5% Submission of second version: **Due Friday July 12<sup>th</sup>, 3:00 pm**
  
- 5% Participation
  - 2% for posting at least 1 thoughtful question/comment/answer in AND reading 50% of the posts in the Forum "Suggested Exam Questions" by **Thursday July 25th, 3:00 pm**  
*Some of the suggested questions will be used on real exams.*
  - 2% for posting at least 1 thoughtful question/comment/answer in AND reading 50% of the posts in the Forum "General Discussion" by **Thursday July 25th, 3:00 pm**
  - 1% for participating in polls distributed throughout the course notes by **Thursday July 25th, 3:00 pm**
  
- 10% Graded Quizzes (at intervals during the course; see *Weekly Schedule*)  
Quizzes 1, 2, 3a and 3b must be completed by **Saturday July 15, 11:55 pm.**  
Quizzes 4, 5, 6 and 7 must be completed by **Friday July 26<sup>th</sup>, 11:55 pm.**
  - There are 8 graded quizzes. There are also 8 self-tests; these are not graded, and are available to you as practice quizzes.
  - Spelling and grammar count on the quizzes! These are online quizzes, so misspelled words will not be recognized.
  - The quizzes are automatically administered through the OWL system. **Don't wait to submit your quizzes until the last minute!** Last minute computer problems will not be accepted as grounds for accommodation.
  - No one will be permitted to complete a quiz after the due dates.

## Scientific Report (essay)

- Details about the requirements for the Scientific Report (essay) can be found on the OWL site under “Assignments”.
- Because this is an “essay course” completion of the essay assignment and a grade of 50% in the second submission are required to pass the course.
- The essay is worth 35% and is submitted in two different versions. The first version will be worth 17.5% of your course grade. You will receive feedback on this version that you can use to improve your essay and resubmit for the second version, which is also worth 17.5% of the course grade. Revising your essay to improve its content, based on feedback from your TA, is an opportunity both to improve your writing and to increase your grade.
- The revised (second) version of the essay may be submitted at any time up to the final submission deadline. **If you do not make any revisions or if you do not submit a second version you will receive the same mark on both “versions.**
- Every effort will be made to complete the grading of the essay in a timely fashion.
- Questions about the essay should be posted to the forum or communicated to your TA or instructor in an email.
- All essay submissions must be made through the OWL submission system. Mail attachments will not be graded.
- When you submit an assignment you will receive an email receipt from OWL and an email receipt from Turnitin.com. **Keep these for your records.**
- Submission problems must be communicated to the instructor and TA before the deadline.
- **Late assignments** submitted within two hours of the deadline will receive a 2% penalty.
- For 5 days following those “**Due Dates**” (including weekend days) reports may be submitted, but will be subject to a mark deduction of 10 % per late day. No reports will be accepted after that. Late penalties may be reduced only upon the recommendation of an academic counsellor.
- When you submit your report, you will get a **Turnitin score**. Scores of up to 30% are not unusual in this kind of writing, but scores in excess of 40% could indicate a problem. Your TA will use the Turnitin report to check for originality in the written content. **If evidence of plagiarism is found, you will get an automatic zero, and you will be reported to the Dean.** Plagiarism is a serious offense (see note on plagiarism below), and is treated seriously in this class.

## Online Forums

The OWL website has a forum feature that you can use to discuss topics related to class material with your classmates. Feel free to ask each other questions, answer other people's questions, and make comments. I will be monitoring the forum at least three times per week, and all class participants are required to read and contribute to the forum. If you have any personal questions, you can email the instructor directly and I will respond. Before sending an email message, consider posting your query to the forum where you may get a quicker response and allow other students to benefit from the discussion. Some information may be communicated only through the forum, so **be sure to check regularly for new forum posts**. Please keep your comments clean, respectful, and on-topic.

Before the deadline on **Thursday July 25th, 3:00 pm**, you are required to:

- Make one original and thoughtful post in the **Write an Exam Question** Forum topics (just once for the whole term in any topic, not once per topic). **This is worth 1% of your grade.** Further details are in the Forum description on OWL.
- Make one original and thoughtful post in the **General Discussion** Forum topics (just once for the whole term in any topic, not once per topic). **This is worth 1% of your grade.** Further details are in the Forum description on OWL.
- You are required to read 50% of the posts in the **Write an Exam Question** Forum (1%)
- You are required to read 50% of the posts in the **General Discussion** Forum (1%)
- There are polls scattered throughout the course notes – please complete the polls and see how your classmates responded. **This is worth 1% of your grade.**

## Academic offences

Electronic devices are not permitted during either the mid-term or end-of-term examinations. These include cell-phones, iPads, tablets, and iPods. They must be turned off and put in your bags. **They are not allowed in your pocket.**

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: [http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)

Plagiarism is a **serious academic offence**. The UWO Senate Academic Handbook defines plagiarism as "The act of appropriating the literary composition of another, or parts or passages of his writings, or the ideas or language of the same, and passing them off as the product of one's own mind." Students must write their assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt by using proper referencing. For more information see Scholastic Offence Policy in the Western Academic Calendar.

**Please note:** When you write your essay, you are **not** allowed to copy and paste **ANYTHING** (even if it's just a sentence!) from **ANYWHERE**. This includes text from websites, papers, books, other students, etc. You are not allowed to copy and paste paragraphs and then change several words. You must gather ideas for your report then **write the entire paper in your own words**. If *any* part of your paper is determined to be plagiarized, that part of your paper will **NOT** be marked. **NO EXCEPTIONS!**

**Plagiarism detection software:** All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

**Multiple Choice:** Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating

### **Students' responsibilities in the event of a medical issue**

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to an academic counsellor in your home faculty as soon as possible *and* contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained immediately from an academic counsellor.

No accommodations will be given without documentation, and you must contact the instructor before the deadline or exam, unless you are physically unable to do so. A student requiring academic accommodation due to illness (including stress/anxiety) should obtain documentation from a doctor.

### **Support Services**

The course is available (upon registration) at <https://owl.uwo.ca/portal>.

Help with computer problems encountered either during initial setup or during the course should be addressed to ITS: <http://www.uwo.ca/its/>

General information about Distance Studies courses, including viewing exam schedules, is available at: [https://www.registrar.uwo.ca/academics/distance\\_studies.html](https://www.registrar.uwo.ca/academics/distance_studies.html)

Instructions for how to contact the Student Development Centre are given here: <http://www.sdc.uwo.ca/>

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.uwo.ca/uwocom/mentalhealth/>) for a list of options about how to obtain help. If you are confused about who to contact, please email me (your instructor) for help.

**SDC's Learning Skills Services:** Rm 4100 WSS, <http://www.sdc.uwo.ca/learning>. Counsellors are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

### **Accessibility Statement**

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x82147 for any specific question regarding an accommodation.

## Course Outline

Each Unit contains an Introduction, a Self-Test and a Graded Quiz. The “Learning Goals” in the Unit Introductions are a starting off point for you to begin your studies. More detailed information on what to study is provided in the “Study Guides” that can be found in the section “Reading and Studying the Material” under the Course Notes.

### Unit 1: Basic concepts

- Chapter 1 – Scientific Theory and the Big Bang
- Chapter 2 – Time and Space
- Chapter 3 – Matter and the Nebular Hypothesis

### 2. Unit 2: The Solar System

- Chapter 4 – A Star called Sun
- Chapter 5 – Geometry of the Solar System

### 3. Unit 3: The Terrestrial Planets

- Chapter 6 – When two planets collide
- Chapter 7 – Earth
- Chapter 8 – The Moon
- Chapter 9 – Mercury
- Chapter 10 – Venus
- Chapter 11 – Mars

\* the Mid-term exam covers up to the end of Chapter 11 \*

### 4. Unit 4: From Asteroids to Meteorites

- Chapter 12 – Asteroids
- Chapter 13 – Meteorites

### 5. Unit 5: The Gas Giant Planets

- Chapter 14 – Jupiter and family
- Chapter 15 – Saturn and family
- Chapter 16 – Uranus and Neptune

### 6. Unit 6: Plutoids, TNOs and Comets

- Chapter 17 – Plutoids and TNOs
- Chapter 18 – Comets

### 7. Unit 7: Extraterrestrial Life

- Chapter 19 – Life in the Universe

\* the Final exam covers the Unit 4 Intro to Chapter 19 \*

### Suggested weekly schedule

This is a suggested schedule – you should plan your own schedule according to your reading speed and your other obligations. There are 2 weeks without suggested readings to allow time to work on your essay and study for the midterm. Plan ahead, read regularly and keep up with the chapters. Numbers in parenthesis are approximate # of pages of text/week without figures.

Week 1, starts May 6 (~14 pages)

- Start work on the essay as soon as your schedule will allow (due in ~3.5 weeks)
- Read the introductory materials and familiarise yourself with course site on OWL
- Unit 1 Introduction
- Chapter 1
- Chapter 2

Week 2, starts May 13 (~24 pages)

- Chapter 3
- Quiz 1
- Unit 2 Introduction
- Chapter 4

Week 3, starts May 20 (~31 pages)

- Chapter 5
- Quiz 2
- Unit 3 Introduction
- Chapter 6
- Chapter 7

Week 4, starts May 27 (no readings)

- Deadline for essay submission: **Friday May 31<sup>st</sup>, 3:00 pm**

Week 5, starts June 3 (~28 pages)

- Chapter 8
- Chapter 9
- Quiz 3a
- Chapter 10

Week 6, starts June 10 (~21 pages)

- Chapter 11
- Quiz 3b
- Midterm on **Saturday, June 15, 9:00 am** (location to be announced)
- Deadline for Quizzes 1-3b: **Saturday June 15, 11:55 pm**

Week 7, starts June 17 (~26 pages)

- Unit 4 Introduction
- Chapter 12
- Chapter 13
- Quiz 4

Week 8, starts June 24 (~22 pages)

- Unit 5 Introduction
- Chapter 14

Week 9, starts July 1 (~29 pages)

- Fireworks (Happy Canada Day!)
- Chapter 15
- Chapter 16
- Quiz 5
- (The second essay deadline is next week)

Week 10, starts July 8 (no readings)

- Deadline for revised essay: **Friday, July 12<sup>th</sup>, 3:00 pm**

Week 11, starts July 15 (~24 pages)

- Unit 6 Introduction
- Chapter 17 Pluto
- Chapter 18 Comets
- Quiz 6

Week 12, starts July 22 (~16 pages)

- Unit 7 Introduction
- Chapter 19
- Quiz 7
- Deadline for posting to 'Write an Exam Question' forum: **Thurs. July 25, 3:00 pm**
- Deadline for posting to 'General Discussion' Forum : **Thursday July 25, 3:00 pm**
- Deadline for reading 50% of Forum posts: **Thursday July 25, 3:00 pm**
- Deadline for participating in the Polls **Thursday July 25, 3:00 pm**
- Deadline for Quizzes 3b-7: **Friday July 26<sup>th</sup>, 11:55 pm**
- Prepare for final exam