

COURSE OUTLINE

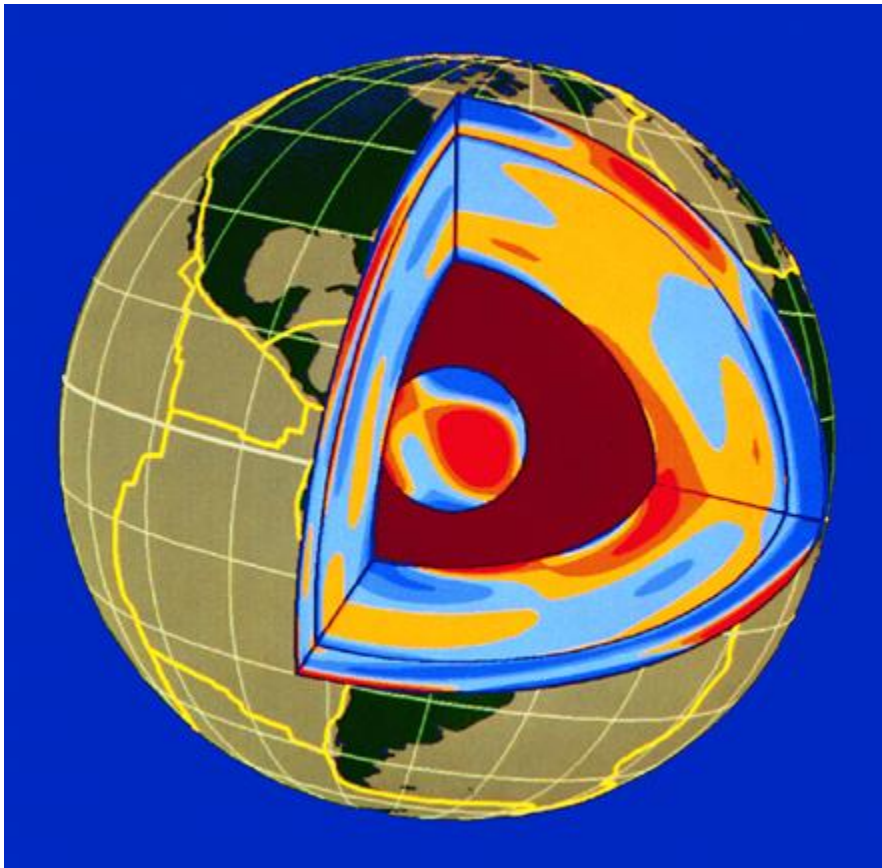
University of Victoria

Department of Physics and Astronomy

School of Earth and Ocean Sciences

PHYS/EOS 427 Geophysics

Spring 2015 (A01)



COURSE OUTLINE

University of Victoria
Dept of Physics and Astronomy
School of Earth and Ocean Sciences

PHYS/EOS 427 Geophysics

Spring 2015 (A01)

Class Schedule:

Tuesday, Wednesday, Friday, 8:30–9:20, Elliot 160

Instructor:

Dr. Stan Dosso

Office: Room A331, Wright Centre for Ocean, Earth & Atmospheric Sciences

Email: sdosso@uvic.ca (please include “PHYS 427” or “EOS 427” in the subject line)

Office Hours: 1:30–3:30 pm Mondays (but welcome to check any time or make an appointment)

Course Description:

Principles of seismology, gravity, heat flow, geochronology, and how they contribute to our understanding of Earth structure and plate tectonics.

Prerequisites:

Prerequisites: PHYS 220 or 321A; PHYS 326;

Pre- or co-requisites: One of MATH 301, 330B, 438; MATH 326 or 346

Text (Optional—Currently unavailable through Bookstore):

C. M. R. Fowler, 2005. *The Solid Earth: An Introduction to Global Geophysics*, Second Edition, Cambridge University Press. Selected material from Chapters 4–7 and Appendices 2–4. Excellent text, but class notes and handouts will be sufficient for the course.

Course Website:

The course website is on the UVic CourseSpaces system. Go to coursespaces.uvic.ca and enter your UVic NetLink ID and password. You should find a list of your courses including PHYS 427 or EOS 427.

Assignments, figures, and handouts will be available as pdf files at the website. Class notes will be posted at the end of the week they are given in class as an additional resource. *Please attend classes and take notes or this policy may change!*

Grading:

Assignments (approx. 8)	— 20 %
Midterm Exam (February 20)	— 20 %
Final Exam (3 hours)	— 60 %

Note:

- Assignments are due in class one week after they are given out in class.
- The final exam will be cover the entire course, with approximately one-third of the questions drawn from material presented before the midterm.
- All requests for Deferred Status for Final Exams must be made at Records Services on a Request for Academic Concession form.
- Any instances of plagiarism or cheating will be reported to the Chair of the Department of Physics and Astronomy or the Director of the School of Earth and Ocean Sciences. Students are advised to refer to the UVic policy on cheating and plagiarism found at web.uvic.ca/calendar2014/FACS/UnIn/UARe/PoAcI.html

Grade Equivalences at UVic:

Percentage	Letter Grade	Num. Grade	Standing
90–100	A+	9	1st Class
85–89	A	8	
80–84	A–	7	
77–79	B+	6	2nd Class
73–76	B	5	
70–72	B–	4	
65–69	C+	3	Pass
60–64	C	2	
50–59	D	1	
< 50	F	0	Fail

Course Outline:

1. Seismic (Elastic) Wave Theory

- Stress and Strain; Hooke's Law in 3-D
- Elastic Wave Equations
- Body Waves: Compressional and Shear Waves
- Reflection and Refraction
- Surface Waves: Love and Rayleigh Waves
- Wave Dispersion
- Wave Propagation Losses

2. Earthquake Seismology

- Overview of the Tectonics and Seismicity of Cascadia
- Inversion of Earthquake Time-distance Curves for Whole Earth Structure
- Density and Elastic Moduli from Seismic Velocity
- Seismic Tomography

3. Gravity

- Gravitational Potential
- Shape of the Earth
- Isostasy (Airy and Pratt Hypotheses)
- Gravity Anomalies
- Laplace and Poisson Equations

4. Heat Flow

- Conduction and Convection
- Heat Flow (Diffusion/Advection) Equation
- Geotherms
- Heat Flow and Ocean Depth

5. Geochronology

- Theory of Radioactive Decay
- Decay Series
- Age of the Earth