



UNIVERSITY OF CALGARY

DEPARTMENT OF GEOSCIENCE COURSE OUTLINE

1. **Course:** GOPH 687, Theory of Seismic Imaging

Lecture Sections:

L01: MoWeFr, 12:00-12:50, SS 117

Dr. J. Bancroft, Office: ES 637, Ph. 403-220-5026, bancroft@ucalgary.ca, Office Hours: 13:00 to 14:00 daily
Geoscience Department ES 118, 403-220-5841, geoscience.ucalgary.ca, geosci@ucalgary.ca

2. **Notes:** Elementary knowledge of vector calculus and partial differential equations is assumed. See also Geology [Course Descriptions](#) of the University Calendar.

3. **Grading:** The University policy on grading and related matters is described sections [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Quizzes	20%
Assignments	30%
Oral report	20%
Paper	30%

A+	$\geq 95\%$
A	$\geq 90\% < 95\%$
A-	$\geq 85\% < 90\%$
B+	$\geq 80\% < 85\%$
B	$\geq 75\% < 80\%$
B-	$\geq 70\% < 75\%$
F	$< 70\%$

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar

5. **Course Materials:** Text will be available on line. "Theory of seismic imaging" by R.J. Ferguson
Supplemental notes as required.

6. **Examination Policy:** Students should read the Calendar, [Section G](#), on Examinations.

7. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

(a) **Academic Misconduct:** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties

(b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

(c) **Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).

(d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

- (e) Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) Student Union Information:** VP Academic Phone: 220-3911 Email: suvpaca@ucalgary.ca.
SU Faculty Rep. Phone: 220-3913 Email: sciencerep@su.ucalgary.ca; [Student Ombudsman](#)
- (g) Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (h)** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

Department Approval: ORIGINAL SIGNED

Date: September 3 2014

Associate Dean's Approval for
Alternate final examination arrangements: ORIGINAL SIGNED

Date: September 8 2014

Outline (subject to change)

1. Basics
2. Seismic reflections
3. Seismic imaging
4. Seismic reflections
5. Computational basics
6. Simplifications
7. Exploding reflector model
8. Phase-shift migration
9. Stolt migration
10. Kirchhoff migration
11. Omega-X migration
12. PSP
13. Downward continuation and RTM