



VANCOUVER ISLAND  
UNIVERSITY

---

SCIENCE & TECHNOLOGY

FORESTRY

## FRST 111 - Forest Surveying Course Outline

---

Term: Fall 2011

Lecture/Lab: Wed. 1:30 - 4:30; Thurs. 12:30 - 2:30  
Bld. 370 Rm. 106, and field locations

Instructor: Bill Beese, MF, RPF  
Office: Bld. 370 - Rm. 223  
Office Hours: Mon. & Thur. 2:30 - 4:30, or drop in  
Email: [bill.beese@viu.ca](mailto:bill.beese@viu.ca)  
Phone: 753-3245 loc. 2260

---

### CALENDAR DESCRIPTION

An introduction to forest surveying. Topics include: field notes; measurement of distance, direction and elevation; calculations and hand plotting of traverses; how to obtain, record and plot topographic detail; the use, care and maintenance of surveying equipment; and safe work procedures for field work.

### SCOPE AND CREDIT

This 3-credit course is designed for students in the first year of the Forest Resources Technology Program.

### COURSE FORMAT

The course is scheduled in two blocks per week (2-hours and 3-hours). Each block usually involves one or more hours of lecture but some entire blocks will consist of practical lab or field exercises. Students are expected to be prepared for the requirements described in the attached schedule. (2:0:3)

Attendance at each session is mandatory. Students should notify the instructor in advance of any anticipated absence.

## TEXTS & SUPPLIES

### Optional Texts:

*Kiser, J. 2010. Surveying for Forestry and the Natural Resources, J. Bell & Associates.*

*Watts, S.B. and L. Tolland (Eds.). 2005. Forestry Handbook for British Columbia, 5<sup>th</sup> Edition, The Forestry Undergraduate Society, UBC Faculty of Forestry.*

### Other References:

*Haynes, N., D.E. Campbell, G. Burson and J. Bigsby. 1992. Forest Surveying & Mapping: an introductory course of the Tahltan Natural Resources Technician Program. Developed for the Tahltan Tribal Council by ApproTech Development Group, reprinted 1997. (Binders available for loan from VIU Forestry Dept.)*

*Ghosh, J. K. 2010. Elementary Engineering Surveying. New Delhi: Studium Press.*  
<http://viu.ebilib.com.ezproxy.viu.ca/patron/FullRecord.aspx?p=588295> (eBook, available on line through the VIU Library)

*UBC Forest Operations Library. Helpful reference material online at:*  
<http://faculty.forestry.ubc.ca/bendickson/FOPRLibrary/Index.html>

Various texts on surveying are also available at the VIU library.

### Required Equipment and Supplies:

Available in the Bookstore:

- Six-ring field binder (preferably Duksbak No. 30) and waterproof notepaper (preferably "Field" or "Metric Cruiser")
- Compass with adjustable declination and azimuth (360 degree) dial; Silva Ranger 515CL or Suunto MC-2 models recommended).

Included in the "Forestry Kit":

- Felt-tip marker (wide, black, waterproof)
- Pencils: 2H
- Douglas (Navigational) protractor
- Protractor Scale (C thru Ruler Co.)
- Biodegradable flagging tape (marking ribbon)

You will also need a personal first aid kit. Kits are sold at Ono Trading Co., 6481 Portsmouth Rd. (near Woodgrove Mall). Ask for the VIU Forestry first aid kit - about \$15 including a student discount and tax. You must carry your first aid kit during all field exercises.

## Personal Protective Equipment (PPE) and Clothing:

### Required PPE:

- Caulk boots
- Orange hard hat
- High visibility apparel (Cruiser's vest (red/yellow/orange) with "hi-viz" reflective strips)
- Safety eyewear or wire mesh face shield on hardhat
- Safety whistle

### Bush clothing:

- Comfortable clothes appropriate for weather conditions
- Rain gear and gloves, as needed

Students inadequately dressed or equipped may be dismissed from field lab sessions.

## LEARNING OUTCOMES

Upon successful completion of this course, students will be able to:

### Knowledge

1. Define and use correctly the technical terms applicable to surveying and mapping
2. Apply both metric and imperial units of measurement and be able to convert from one system to the other (for interpreting old maps or surveys)
3. Explain magnetic declination, conversion between horizontal and slope distances, latitudes and departures, and terms for survey precision
4. Describe the potential hazards of working in the forest, safe work procedures for carrying out tasks, personal protective equipment requirements and emergency procedures

### Skills

1. Measure using field instruments (to a minimum precision of 1%):
  - a. horizontal distances
  - b. direction
  - c. vertical angles
  - d. vertical distances
2. Record field observations and measurements in the form of clear, concise field notes with a professional appearance
3. Compile and draft from field notes:
  - a. closed traverses with a minimum precision of 1%,
  - b. topographic maps to BC government forestry standards
  - c. topographic profiles
  - d. *Note: After hand compilation of the above, students will use appropriate survey software (in FRST 121) to produce maps based on field data.*

4. Operate, adjust and maintain in good working order the field equipment and instruments used for forest surveying (chain or tape, clinometer, compass, laser rangefinder). *Note: use of an engineer's transit and GPS are covered in other VIU Forestry courses*
5. Apply basic math skills required for common calculations in map use:
  - Convert between various metric and imperial units
  - Using similar proportions solve for map scales and interpolate contour lines from spot heights
  - Using trigonometry convert between slope & horizontal distances, determine latitudes and departures
  - Using Pythagoras Theorem solve for error of closure

### Attitudes

1. Appreciate the need for accuracy, quality and integrity in forest surveying.
2. Value the importance of health and safety in the workplace and in your personal life.

### EVALUATION

#### Grade Breakout (subject to change):

Lab Assignments & Quizzes*	25%
Uneven Ground Traverse	15%
Topographic Mapping Project	15%
Midterm Exams (10% & 15%)	15%
Final Exam	20%
Instructor Assessment	10%

\* Cover recent lecture & reading material

Missed quizzes receive a mark of zero;  
your lowest quiz mark will be dropped.

All assignments and lab reports, unless otherwise announced, are due at the **start** of the following lab period. Apart from extenuating circumstances, all work must be handed in when due to receive full marks. No marks will be awarded for late assignments if marked work has already been returned to the rest of the class.

Written presentations: Marks will be lost from assignments when the standard of grammar or spelling is lower than can be expected at the University level.

At the end of field classes for which students have used their own transportation, the instructor supervising the exercise **must** be notified before a student can leave the exercise area.

### ACADEMIC POLICIES

For information on exam policies, missing tests, assignment format standards, late assignments, instructor assessment and academic misconduct (e.g., plagiarism), please refer to the VIU Forestry Department website: [Forestry Portal](#)

## TENTATIVE SCHEDULE (subject to change)

Week	Dates	Wednesday (1:30–4:30)	Thursday (12:30–2:30, or as noted)
1	Sept 7,8	Introduction to the course, surveying, safety	Measurement of Horizontal Distance <b>[O]</b> * (Duksback notebook required)
2	Sept 14,15	Measurement of Horizontal Angles, Declination <b>[O]</b>	Principles and Practice of Field Notes
3	Sept 21,22	Hand Compass Traverse-1 <b>[O]</b> (Vest & notebook)	Maps: Principles of Drafting
4	Sept 28,29	Plotting the Traverse (Drafting equipment needed)	Angles of Elevation, Slope Conversions, Elevations
5	Oct 5,6	<b>M I D - T E R M I</b>	<i>TBA (Instructor away, FRST 291 - Interior Field Trip)</i>
6	Oct 12,13	Practice Slope Conversions <b>[O]</b> (on Campus)	Latitude and Departures Field Safety Review
7	Oct 19,20	Hand Compass Traverse-2 <b>[O]</b> (all field gear)	Hand Compass Traverse-2 <b>[O]</b> (all field gear)
8	Oct 26,27	Plotting the Traverse Lat/Dep Spreadsheet	Intro Uneven Ground Traverse and Digital Plotting
9	Nov 2,3	Uneven Ground Traverse <b>[O]</b>	Uneven Ground Traverse <b>[O]</b>
10	Nov 9,10	Contours: Theory and Drawing Topographic Profiles	<b>M I D - T E R M 2</b>
11	Nov 16,17	Strip Lines and Mapping	Run Topog. Strips <b>[O]</b> (all field gear)
12	Nov 23,24	Run Topog. Strips <b>[O]</b> (all field gear)	Topog. Mapping Project
13	Nov 30, Dec 1	Topog. Mapping Project	Mapping Field Trip (with 121/131) <b>[O]</b>
	<i>Dec 5 Dec 6-19</i>	<i>Last day of VIU classes (Mon) Study days (6,7), Exams (8-19)</i>	<i>Date of FRST 111 Final Exam TBA</i>

- **\*[O]** = Outside: Some or all of the class will be spent out of the classroom. Students must be prepared with appropriate field gear for prevailing weather conditions.