UNIVERSITY OF WATERLOO

Department of Geography & Environmental Management

GEOG 310 GEODESY & SURVEYING, Fall 2017
Course Outline

Instructor:	Prof. Jonathan Li, Office: EV1-111, Ext. 34504, E-mail: junli@uwaterloo.ca
TAs:	Ma, Lingfei: l53ma@uwaterloo.ca Carrillo Garcia, Juan: jmcarril@uwaterloo.ca TBD
Office Hours:	Th 2:00 – 3:00pm, or by appointment.
Lecture Hours: **Lab Hours:**	Lecture Hours: T 8:30 – 10:20 am, Room DWE-3522. Lab 101: M 1:30 - 3:20pm, Room EV2-1002A Lab 102: F 8:30 - 10:20am, Room EV2-1002A Lab 103: M 11:30 - 1:20pm, Room EV2-1002A
Prerequisites:	GEOG 181 Principles of GIScience. Knowledge of algebra, plane and analytical geometry, and plane trigonometry are strongly required.
Course Objectives:	To provide students a general understanding of geodesy and surveying, the shape, motion and gravity field of the earth; to familiarize with surveying instruments and operations, to apply typical surveying computations.
Course Description:	Concepts of geodesy and surveying, earth's gravity field and the geoid, and measurement techniques applied to geomatics are examined. Field studies include the use of level, total station, and GPS for doing distance and angle measurements, leveling, traversing and topographic surveying.
Textbook:	Jack C. McCormac, Wayne Sarasua, William Davis, 2012. ***Surveying***, 6th Edition, Wiley, Toronto, ISBN 978-0-470-49661-9, 379pp.
Delivery Mode:	Concepts and theory will be taught during lectures while fieldwork and computation will be done during the lab slot. Lecture notes will be available in a PDF format on LEARN. Additional handout material will be provided as necessary. Lab assignments will be discussed during lab hours.
Evaluation:	• Lab assignments (7 x 5%) 35% • Mid-term exam (1.5 hours, closed book) 20% • Final exam (2.5 hours, closed book) 45%
Notes:	• If a student misses the mid-term exam for a legitimate reason, the final exam would be worth 60% of the student's final grade. • Write-ups for lab assignments must be typed in the required format, and e-mail submissions will not be accepted for grading**. A late submission will result in a penalty deduction of 5% per day of the total given mark for the assignment.**

	The instructor reserves the right to waive this deduction if there is a legitimate reason. • A non-programming calculator is allowed during the exam.	
	WEEKLY CLASS ACTIVITIES	
Week/Date	**Lecture Topics/Readings**	**Labs**
2/Sept 12	Lecture 1: Course introduction & Measurements, Chs 1/2	F/Sept 15 Grouping & Operating Levels and Total Station Instruments (TSIs)
3/Sept 19	Lecture 2: Leveling Chs 6/7/8	M/Sept 18 Operating Levels and TSIs; F/Sept 22 Lab-1 Differential Levelling
4/Sept 26	Lecture 3: Angle measurement Chs 9/10/11	M/Sept 25 Lab-1 Differential Levelling F/Sept 29 Lab-2 Measuring Angles
5/Oct 3	Lecture 4: Distance measurement Chs 3/4/5	M/Oct 2 Lab-2 Measuring Angles F/Oct 6 Lab-3 Trigonometric Leveling
6/Oct 10	Fall Study Days (University is open, no classes are scheduled)	**Thanksgiving break, no Lab.**
6/Oct 12	Tutorial #1: Lectures 1 – 4 ***This class is make-up for the Thanksgiving break.**	**Thanksgiving break, no Lab.**
7/Oct 17	**Midterm Exam (1.5 hrs closed book)** 8:30 -10:00, **Lab-1 & Lab-2 due**	M/Oct 16 Lab-3 Trigonometric Leveling F/Oct 20 Lab-3
8/Oct 24	Lecture 5: Traverse surveys Chs 9/12,	M/Oct 16 Lab-3 F/Oct 20 Lab-4 Traversing
9/Oct 31	Lecture 6: Route surveys: H-curves Ch 22, **Lab-3 due**	M/Oct 30 Lab-4 Traversing F/Nov 3 Lab-5 Computing H-curves
10/Nov 7	Lecture 7: Route surveys: V-curves Ch 23, Lab #3 & Lab #4 due	M/Nov 6 Lab-5 Computing H-curves F/Nov 10 Lab-6 Computing V-curves
11/Nov 14	Lecture 8: GPS principles Ch 15, **Lab-4 due**	M/Nov 12 Lab-6 Computing V-curves F/Nov 17 Lab-5/Lab-6
12/Nov 21	Lecture 9: GPS surveys Ch 16, **Lab-5 due**	M/Nov 20 Lab-5 & Lab-6 F/Nov 24 Lab-7 Surveying with GPS
13/Nov 28	Lecture 10: Topographic surveying Ch 14, **Lab-6 due**	M/Nov 27 Lab-7 Surveying with GPS F/Dec 1 Lab-7
14/Dec 5	Tutorial #2: Lectures 6-10 **Lab-7 due**	M/Dec 4 Lab-7
Dec 5 - 20	**Final Exam (2.5 hours, closed book)** **Date TBD**	Final exam covers 20% of Lectures 1-5, 80% of Lectures 6 -10.

UW Policies

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. www.uwaterloo.ca/academicintegrity/. Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial at: http://www.lib.uwaterloo.ca/ait/

Research Ethics: Please also note that the 'University of Waterloo requires all research conducted by its students, staff, and faculty which involves humans as participants to undergo prior ethics review and clearance through the Director, Office of Human Research and Animal Care (Office). The ethics review and clearance processes are intended to ensure that projects comply with the Office's Guidelines for Research with Human Participants (Guidelines) as well as those of provincial and federal agencies, and that the safety, rights and welfare of participants are adequately protected. The Guidelines inform researchers about ethical issues and procedures which are of concern when conducting research with humans (e.g. confidentiality, risks and benefits, informed consent process, etc.). If the development of your research proposal consists of research that involves humans as participants, the please contact the course instructor for guidance and see:
www.research.uwaterloo.ca/ethics/human/

Note for students with disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.

Religious Observances: Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt, please contact your Undergraduate Advisor for details.

Discipline*:* A student is expected to know what constitutes academic integrity, to avoid committing academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, www.adm.uwaterloo.ca/infosec/Policies/policy71.htm. For typical penalties, check Guidelines for Assessment of Penalties, www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm

Appeals: A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 – (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals). See: www.adm.uwaterloo.ca/infosec/Policies/policy72.htm

Consequences of Academic Offences: ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office, see: http://uwaterloo.ca/academicintegrity/Students/index.html

Turnitin: Plagiarism detection software (Turnitin) will be used to screen assignments on this course. This is being done to verify use of all material and sources in assignments is documented. In the first lecture of the Term, details will be provided about the arrangements for the use of Turnitin. **NOTE:** Students may request an alternative to Turnitin, which is to prepare an annotated bibliography for each assignment. For advice on how to prepare an annotated bibliography, see:
http://www.lib.sfu.ca/help/writing/annotated-bibliography