CENG 2336 Syllabus Geomatics

CENG 2336 Geomatics
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1. Welcome to CENG 2336 (Geomatics). During the upcoming semester you will learn the theoretical and applied components of Geomatics. We will meet according to the tentative course schedule (shown below) which includes the course topics. The course objectives are found at the end of this Syllabus.

2. **My course schedule is from 2:00 pm to 2:55 pm on Monday and Wednesday in room A217, and Lab on Monday from 3:00 pm to 5:45 pm in room D114**. If you will miss a scheduled class, you are still responsible for the material.

3. You are welcome to seek additional instruction. I have set aside Office Hours (please see my schedule at my office door).

4. Class Room Procedures:

a. I will take random attendance in lectures and daily attendance in labs– please help me by ensuring the Attendance Sheet is circulated around the classroom during both the laboratories and lectures.

b. It is a basic principle of professionalism that **"Professionals are not Late."** Please come to class on time and leave on time**. Interruption of lecture is not acceptable.**

c. Bring study notes, textbook, note-taking material, straight edge and calculator TO EVERY CLASS. You may not borrow or exchange calculators during graded events. If your calculator fails during a graded exercise, I am not responsible to furnish a substitute. Class preparation is your individual responsibility. Please refer to the Calculator Policy.

d. **Textbook: Surveying 6th Edition, McCormac, Jack; Sarasua, Wayne; Davis, William. John Wiley & Sons, Inc., ISBN 978-0-470-49661-9, 2013.**You are also required to purchase a Surveying Field Book available at the department office. There will be handout materials for this course as well.

e. Read the chapter assignments before the lecture so that you will be prepared for class discussions. I may have announced and unannounced quizzes over the text assignments if it appears that students are not reading the assigned text materials.

f. **ACADEMIC DISHONESTY:** Representation of other's work as your own will not be tolerated. Cheating on examinations, quizzes, and homework and the false representation of work will be interpreted as academic dishonesty. Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline. Please refer to the University of Texas at Tyler current Undergraduate Catalog for academic policies and Manual of Policies and Procedures for Student Affairs (MOPPS, Chapter 8) regarding academic integrity, cheating and plagiarism. Academic dishonesty will not be tolerated. Ignorance of the rules and policies will provide no protection from the consequences.

5. Exams and Grading:

Course Points		**Grade Scale**		
Mid-term Exams (2 at 250 each)	500 (25%)	A+	96.67%	1933
Homework/ Pop Quizzes	400 (20%)	A	93.33%	1866
Labs (Group and Individual)	400 (20%)	A-	90.00%	1800
		B+	86.67%	1733
Professional Practice	200 (10%)	B	83.33%	1666
Final Examination	500 (25%)	B-	80.00%	1600
Course Total	2000 (100%)	C+	76.67%	1533
		C	73.33%	1466
		C-	70.00%	1400
		D	65.00%	1300
		F	<65.00%	<1300

You MAY fail this course, if you earn less than 60% on all Exams or if you fail to earn at least 60% on the Final exam, **regardless of your course grade**. Of course, according to UT Tyler grading policies final grades are only A, B, C, D, F and therefore, a C- is a C for a final grade. The distribution provided above is to graphically remind you of how well you are doing and your progress in the course.

a. Hour Exams and Final Exam:
   1) The dates for Hour Exams are included in the course schedule. Official reasons for missing an exam include official University participation, family emergency, or other unforeseen circumstance. See policies for Student Absence in this syllabus, Section 11 and Section 12 below. Regardless of the reason you are required to notify the instructor prior to the exam and as early as feasible. You are required to take a make-up Exam, regardless of your reason for missing the scheduled Exam. Report any conflict to me as soon as possible prior to the Exam.
   2) All the Exams and the Final are closed book and notes. You are encouraged to use an **NCEES approved calculator. All test questions will be formatted in order to use the same calculator that you MUST use for the FE exam.** Non-approved NCEES calculators may be used for the exams. You will also be allowed the CENG 2336 reference sheet if one is supplied by the instructor for an examination.

      (1) If you are unsure about your calculator, it is your responsibility to check with the instructor for approval.
      (2) It is recommended that additional batteries be carried with you during exams.

   3) Register on Canvas because solutions to exams will be posted on Canvas. Other class resources as needed will be posted on Canvas.

b. The use of any electronic device (laptop/PDA/Cell Phone/MP3 player/or similar device), during class and exam is prohibited. Your exam will be collected and your grade will be a zero if you are caught using a non-approved electronic device/calculators. The use of phones and MP3 players is not permitted during lectures. The second occurrence of phone use, for any reason, may result in the forfeiture of the device. If you plan to record the lectures for your personal use please notify me.

c. Collection of Student Work: Throughout the semester I will collect student work (best, average, and worst) for the ABET course or program outcomes notebooks. This will require me to make a copy of your work, keep your original, and return a copy of the graded work to you. I will not draw attention as to what level of work you accomplished.

d. Embedded indicators of accomplishment of program outcomes: At times throughout the semester, portions of student work will be analyzed to determine if our program is accomplishing stated program outcomes based on established metrics. If your work is below the minimum established metric, you may be required to repeat the assignment or that portion of the assignment until you achieve the minimum acceptable standard based on the metric.

6. Homework: The purpose of homework assignment is to help reinforce what was taught in class. It helps to prepare students for exams and tests, including statewide exams. Completing homework assignment makes students more responsible and helps them learn time management skills. It gives students another chance to review class material.

Homework: Homework problems will be assigned on a weekly to semi-weekly basis. Students may *discuss* their homework solutions with one another, but each student must submit their own, **independent** solutions (i.e. you may not just copy someone else's homework). If you receive assistance from a fellow student on a particular problem you must cite that assistance within your solution. The homework due date is marked on the attached schedule sheet or will be announced in class. Homework is due *before* class starts. Assignments turned in after class starts will be considered late. Homework turned in late, but within one day of the due date, will receive a 25 percent reduction; homework turned in within two days of the due date will receive a 50 percent reduction; homework turned in within three days of the due date will receive a 75 percent reduction. *No credit will be given for homework turned in more than three days late* or after the solution has been published on the course Blackboard.

> HOMEWORK FORMAT: The production of a neat, organized, high-quality homework assignment cannot be overestimated nor can its importance to your course grade be overstated. A homework assignment should be something you are proud of and not something hastily "slapped together". Toward this end, considerable emphasis will be placed on not only getting the correct answer but also on how the solution is presented.
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> All homework is mandatory and becomes part of your grade. As an engineer your goal is to make a clear, logical, and professional presentation of your work. As such both your presentation and the accuracy of your work is important, and both will be graded. It is critical that you show all of your work and leave "foot prints" so that it can be easily followed. No guess work should be required to see what you did. All submissions are due at the beginning of class on the due date.

a. Homework - Problem Sets (PS)

1) **Use Engineer paper only** with solutions placed in the logical flow of the problem printed on engineering paper; one side only. Clearly present **a brief problem statement or a sketch** with your solution. Clearly and concisely explain each step. For narratives of more than a line or two, use your word processor or the text capability if you are using MathCAD or Excel. If you are writing out a paragraph or more, you must type it in a word processing package.

2) Late Submissions. It is a basic principle of professionalism that **"Professionals are not Late".**

Obviously, there are circumstances that will occur and make a timely submission impossible and I will work with you if and when those circumstances legitimately occur.

3) All homework in this course must be properly documented. As you are having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me are considered immediately available to all students and need not be acknowledged or documented. **YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED.** Documentation will be accomplished in accordance with any manual for writing, footnote or endnote, for papers, but for written homework, just place the documentation right at the point you received help describing who and what assistance.

b. Assigned readings. Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (*I will not cover everything in the lecture*). It will also make you more familiar with terms and concepts to be covered. To help motivate you to do the reading there may be unannounced quizzes that cover the assigned sections of the text.

7. Students Rights and Responsibilities. To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html

8. Grade Replacement/Forgiveness. If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

9. State-Mandated Course Drop Policy. Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the 12th day of class (See Schedule of Classes for the specific date). Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard. Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

10. Disability Services. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-

7079.Additional information may also be obtained at the following UT Tyler Web address: http://www.uttyler.edu/disabilityservices

11. Student Absence due to Religious Observance. Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

12. Student Absence for University-Sponsored Events and Activities. If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

13. Social Security and FERPA Statement. It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

14. Emergency Exits and Evacuation. Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do Not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link:http://www.uttyler.edu/wellness/rightsresponsibilities.php

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is availableathttp://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, waterpipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visitwww.uttyler.edu/tobacco-free.

Laptops/PDAs/MP3 players/Cell Phones or other electronic devices

- The use of any electronic device, except an approved calculator, is not permitted during exams. Your exam will be collected and your grade will be a zero if you are caught using a non-approved electronic device/calculators. Any instances of a calculator inappropriately used during an exam will be the basis of alleging Academic Misconduct and may result in Failing (F) of the course at the determination of the course's instructor or the basis for a recommendation for expulsion from the University. Any Calculator used during an exam in this course must meet the requirements stated within the policy below.
- **Calculator Policy**

  Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are using a non-approved calculator.

  The approved calculators include the following: (Please check the NCEES website for a complete listing, www.ncees.org/exams/calculator-policy/. Examples include but are not limited to:

  - Hewlett Packard – HP 33s, HP 35s, and no others
  - Casio – All FX 115 models
  - Texas Instruments – All TI 30X or TI-36X models.
  - If you are unsure about your calculator, it is your responsibility to check with the instructor for approval.

  At the discretion of the course instructor, any calculator not meeting the requirements stated (especially in the case of a graphing calculator) may be used but only after an inspection of the device and a clearing of all the memory within the device, performed for the instructor at a time immediately prior to the exam. At any time during the exam your calculator is subject to a random search by the instructor. Failure or refusal to clear all memory or to surrender your calculator to search will disqualify you from the exam immediately, unless you can produce a calculator meeting the requirements as stated above.

COURSE OUTLINE and SCHEDULE

Topics Covered

SUBJECTS	LESSONS	LABS
Surveying:		
Basic Concepts	1	--
Distance Measurements	3	1
Leveling	3	1.5
Angles and Directions	3	3
Area and Volume	4	--
Topography Surveys	1	1
Horizontal and Vertical Curves	3	--
Construction and Land Surveys	1	--
Advanced Technologies		
GPS	2	2
GIS	1	1
Data Analysis and Management		
MS Excel	--	0.5
Project Presentations	--	1
Work Sessions and Reviews	2	--
Course Summary	2	--
Exam Days	3	--
Totals	29	11

Course Schedule (Subject to Revision)

Week	Lsn #	Special	DATE	Material covered	Text	Lab	Homework Due
1	1		26-Aug	Course Introduction	Ch 1	No Lab Meeting	
	2		28-Aug	Measurement and Analysis	Ch 2		
2			**2-Sep**	**Labor Day Holiday**		No Lab Meeting	
	3		4-Sep	Distance Measurements	Ch 3		
3	4	Census 9/9	9-Sep	Distance Measurements and Corrections	Ch 4	Lab 1 Distance Meas. (tape/pace)	
	5		11-Sep	Introduction to Leveling	Ch 6		HW #1
4	6		16-Sep	Differential Leveling	Ch 7	Lab 2 Level & rod	
	7		18-Sep	Profile and Cross-Section Leveling	Ch 8		HW#2
5	8		23-Sep	Angles and Directions	Ch 9	Lab 3 Profile Leveling & Excel Tutorial	
	9		25-Sep	Intro. to Total Station Angle Measurement	Ch 10		HW#3
6	10		30-Sep	Error Measurements on Angles	Ch 11	Lab 4 Practice Total Stations	
	11		2-Oct	Review for Exam 1			HW#4
7	12		**7-Oct**	**Exam I**		Lab 5 Total Station: Angles	
	13		9-Oct	Traverse Adjustment & Area Calculations	Ch 12		
8	14		14-Oct	Traverse Adjustment & Area Calculations	Ch 12	Lab 6 TS Scavenger Hunt	
	15		16-Oct	Topographic Surveys	Ch 14		
9	16		21-Oct	Volume Calculations	Ch 20	Lab 7 Lab Practical Exam	
	17		23-Oct	Volume Calculations			HW#5
10	18		28-Oct	Intro. to Horizontal Curves	Ch. 22	Lab 8 GPS Scavenger Hunt	
	19		30-Oct	Review for Exam 2	Ch 23		
11	20	4-Nov W Day	**4-Nov**	**Exam 2**		Lab 9 GPS Topographic Survey	
	21		6-Nov	Intro. to Vertical Curves			
12	22		11-Nov	Horiz. And Vert. Curves	Ch 22 & 23	Lab 10 GIS Practice	
	23		13-Nov	Intro. to GPS	Ch 15		HW#6
13	24		18-Nov	Advanced GPS Introduction to GIS	Ch 16		
	25		20-Nov		Ch 17		HW#7
			25 – 30 Nov	**THANKSGIVING**			
14	26		2-Dec	Advanced GIS & Land and Property Surveying	Ch 18 & 21		
	27		4-Dec	Final Review			HW#8
15				**9 – 14 Dec. Final Exam**			

CENG 2336 Geomatics
Course Objectives:

1. Explain and apply fundamental surveying concepts to a variety of real world applications.
2. Demonstrate the proper usage of surveying equipment including levels and total stations.
3. Use spreadsheets and math solving programs as a tool to perform the mathematical operations required in geographically-referenced data applications.
4. Demonstrate the ability to analyze and interpret field survey data.
5. Explain basic GPS and GIS concepts and its application to real world problems.