

ITCM 310 - Plane Surveying
Syllabus - Fall 2007
 Department of Industrial and Engineering Technology
 College of Science and Technology
 Morehead State University



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Course Description: (2-2-3); I. Prerequisites: MATH 152 or higher, ITCD 103. A study of modern surveying methods and equipment, field and office procedures, and surveying applications in the planning, design, layout, and construction of our physical environment and infrastructure.

IMPORTANT:

- You are **registered** for this class at MSU but you **MUST ALSO ELECTRONICALLY ENROLL** for the class online at <http://moreheadstate.blackboard.com/>.
- Enrolling on Blackboard for ITCM 310 is not optional and **MUST** be completed immediately.
- Once enrolled, access the course online and click *Student Tools*, then *Personal Information*, then *Edit Personal Information* to update your email address and other information.
- It is **VERY IMPORTANT** to complete the Blackboard enrollment step and especially updating your email address on Blackboard.

Tentative Outline of Course Content

Week	Topic
1 (MW)	Introduction, Definition, Historical perspective
2 (TTh)	Mathematics review, Measurement - error, accuracy, precision
3 (MW)	Note keeping and sketching, Horizontal measurement
4 (TTh)	Horizontal measurement methods - application and instrumentation
5 (MW)	Exam#1 , Horizontal control - slope measurement and error estimation
6 (TTh)	Vertical measurement methods - application and instrumentation
7 (MW)	Differential leveling - small perimeter circuits, error of closure, pacing
8 (TTh)	Differential leveling - large perimeter circuits, error of closure, taping
9 (MW)	Exam #2 , Profile leveling application and instrumentation
10 (TTh)	Directional measurement - bearings, azimuths
11 (MW)	Horizontal/vertical angles - application/instrumentation
12 (TTh)	Horizontal control surveys - traversing
13 (MW)	Exam #3 , Traverse closure methods - latitude and departure
14	Traverse closure methods - coordinates, Thanksgiving Break
15 (TTh)	Traverse closure methods - computer applications
16 (MW)	Area computation methods
17	Exam #4 (Monday, Dec. 10, 12:45 – 2:45 p.m.)

Textbook

- Kavanagh, B.F. 2007. Surveying with Construction Applications. 6th Edition. Upper Saddle River, NJ: Prentice Hall.
- A field book (available in MSU bookstore) is required for the laboratory. The field book measures 4.5" by 7" with a yellow cover, titled "All-Weather Field Notebook No. 351."



Course Competencies and Assessment Techniques: This course is designed to provide knowledge and skills necessary for an intermediate level surveyor, including basic knowledge of the proficient application of field and office procedures and skillful utilization of surveying instrumentation. Upon successful completion of this course, the student will have gained the following competencies:

1. Understand the concept of surveying as both an art and science (**evaluated in Assignment #1, Exam #1, and Portfolio**).
 - List and explain the types of surveying.
 - Explain how the skill or art of effectively using equipment is combined with science and mathematics principles to accomplish the surveying tasks.
2. Understand surveying applications in the planning, design, layout, and construction of our physical environment and infrastructure (**Assignment #1, Laboratories #1 and #2, Exam #1, and Portfolio**).
 - Explain and demonstrate the meaning of "true" measurement of a surveyed line.
 - Explain and give examples of plane and geodetic surveying methods.
3. Understand common field and office practices and procedures used in surveying (**field lab exercises - #1-#5, and Exam #1, #2, and #3**).
 - Gain familiarity with and effectively use surveying equipment for vertical & horizontal control.
 - Maintain proper field notes of laboratory exercises.
 - Generate lab reports with appropriate information and sketches of laboratory field activities.
4. Understand accuracy and precision requirements for basic surveying applications (**Lab #4, Assignment #2, and Exam #1**).
 - Demonstrate an understanding of accuracy and precision as related to surveying methods.
 - Conduct relative accuracy computations and compare to acceptable industry standards.
 - Conduct probable range of values computations.
5. Demonstrate the application of surveying methods and instrumentation for horizontal and vertical control (**Labs #3, #4, #5, Assignments #3 and #4, and Exams #2 and #3**).
 - Conduct laboratories in differential leveling techniques to required industry accuracy standards.
 - Conduct laboratories in traverse layout and control to required industry accuracy standards.
6. Perform closure computations for vertical and horizontal control circuits (**Labs #3, #4, #5, Assignments #1, #4, and #5, and Exams #2, #3, and #4**).
 - Complete assignments and laboratory reports with sections on closure computations.
 - Compute error of closure, relative accuracy, precision, maximum allowable error.
 - Demonstrate an understanding of vertical and horizontal survey accuracy requirements.
7. Utilize coordinate measurement systems of simple traverses for mapping (**Lab #5, Assignments #5 and #6, and Exam #4**).
 - Using field data from laboratory activities, complete traverse computation sheets to generate coordinates of horizontal traverse stations.
 - Plot coordinates of field data on a traverse plat.

Instructional Process: The course is designed to introduce students to surveying knowledge and skills. The course is organized around a series of interrelated theoretical topics and applied (hands-on) laboratories. A significant portion of the course material is technical information, which will be covered through lecture, class discussion, and supported by group fieldwork. Your success in this course, and thus your learning experience, depends on your participation both in class and laboratory.

Grading Description:

Exams (4 @ 50 points each)	200
Laboratory Reports (5 @ 30 points each).....	150
Laboratory Field Book (2 checks @ 25 each)	50
Assignments (5 @ 15 points each).....	75
Portfolio	25
Total.....	500

Laboratory Reports: Five (5) lab reports will be assigned throughout the semester. This work must be written or typed legibly on white paper or green engineering pads. These reports must be submitted on the due date at the beginning of class; late reports will not be accepted. However, a student can submit a report at the next class attended after an absence with a documented excuse for the due date of the report. See attached “Laboratory Report Format” document for details of acceptable lab report content and format.

Assignments: Students will be assigned out-of-class weekly or bi-weekly writing and/or analytical work. This work should be written or typed legibly on white paper or green engineering pads appropriate for junior-level technology courses. Assignments must be submitted on the due date at the beginning of class; late assignments will not be accepted. However, a student can submit any assignment at the next class attended after an absence with a documented excuse for the due date of the assignment.

Grading assignments/reports/exams: All written assessment will be graded and returned to students within one week of submission by students. The instructor will provide written feedback to students in the form of completed rubrics or handwritten comments on student assessment items (i.e. papers, assignments, reports, exams). Once an assessment item is returned, students are encouraged to ask for a review of any graded work, if it is felt the grade received was not appropriate or accurate. Within one week of receiving the graded assignment, the work in question must be returned by the student with a written or oral statement of explanation. This statement must be justified and supported by lecture notes, textbook, or other material from class. The final decision for the grade on all student assessment items is the responsibility of the class instructor.

Attendance: Perfect and punctual attendance is expected. A role will be taken at the beginning of each class. Consistent tardiness is unacceptable; three occurrences of a student arriving late for class will equate to one absence. The following attendance bonus/penalty plan will apply to all students:

- NO absences (excused or unexcused) – 10 bonus points added to student’s final course score.
- One absence (excused or unexcused) – No affect on student’s final course score.
- Two absences (excused or unexcused) – 15 points deducted from student’s final score.
- Three absences (excused or unexcused) – 25 points deducted from student’s final score.

- Four absences (excused or unexcused) – 50 points deducted from student’s final score.
- **Any student missing five or more classes (excused or unexcused) will automatically receive a failing grade of “E” for the course regardless of other scores.**

The instructor retains the option to vary this attendance policy under extenuating circumstances.

Disruptive or distracting behavior: Disruptive or distracting behavior of any type is not allowed in class. This includes talking (excluding class discussion, of course), reading newspapers, snoring, etc. Students that disrupt the class may be asked to leave. Regarding late arrivals to class, consistent late arrivals are considered a serious disruption to the class. The instructor will maintain a written record of late arriving students. After a student accumulates three (3) late arrivals, the instructor will ask the student to leave the classroom for all other class sessions in which the student arrives late.

Cell phones and pagers: The use of cellular phones and pagers has become common. The operation of a cell phone and pagers during a university class is likely to disrupt the class. Therefore, **all cell phones and pagers must either be turned off or set to a silent mode of operation (e.g., vibrating rather than beeping) during class and laboratory.** If you must answer a call, please quietly leave the classroom. Students whose phones disrupt the course will be asked to verbally apologize to the entire class and will be required to leave the class for the remainder of that session. The class instructor may approve an exception for special circumstances, based on a student request prior to class session.



Academic honesty: Cheating, fabrication, plagiarism or helping others to commit these acts will **not** be tolerated. Academic dishonesty will result in severe disciplinary action including, but not limited to, failure of the student assessment item or course, and/or dismissal from MSU. If you are not sure what constitutes academic dishonesty, read The Eagle: Student Handbook or ask me. The policy is located at:

<http://www.morehead-st.edu./units/studentlife/handbook/academicdishonesty.htm>

Note: Copying information from the Internet is plagiarism if appropriate credit is not given.

Policy for Accommodating Students with Disabilities: In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. It is the student’s responsibility to inform the instructor of any special needs before the end of the second week of class.

Campus Safety Statement: Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at www.moreheadstate.edu/emergency.

ITCM 310 Laboratory Activity Report Format

Lab Description:

- Lab Title (top of page).
- Brief description of lab.
- Lab partners (first and last names), identifying crew chief.
- For each day in lab activity, date, time (start and finish), location, weather.

Objective:

- Concise, specific lab objective (intent or reason the lab activity was conducted).

Procedure:

- Concise methodology of the laboratory activity including:
 - Basic “step-by-step” list of technique or approach used by students in the activity.
 - List of equipment used, if applicable (list SN of instrument used).
 - Materials and supplies used, if applicable.
- Technical drawing of surveying area and surrounding structures
 - Lab activity location and surveying area, including local objects (buildings, trees, etc). Surveying area should be dominating portion of drawing.
 - Use hand or computer-generated drawings with standard formats, procedures, and instrumentation from ITCD 103. Absolutely, no free-hand drawing is allowed.

Note: List format may be preferable rather than narrative for technical lab reports.

Data Collected:

- Detailed report of all data, observed and assumed, as well as mathematical constants used in the laboratory activity.

Note: Data best presented in tabular or list format rather than narrative for technical lab reports.

- All related calculations (during and after laboratory activity) should be fully explained in mathematical format with detailed formulas, variable labeling, sample calculations, and arithmetic checks.

Conclusions/Results:

- Concise report of laboratory activity technical results, including list or narrative description of activity outcomes.
- Results should address the following question: Was the laboratory objective (stated above) accomplished? Why or why not?

Format and Style:

- Lab report must be legibly hand-written or typed or a combination of hand-written and typed.
- Use white paper or green engineering paper for lab reports. No notebook or spiral bound paper is allowed.
- Lab report is to be written as a technical report in a professional style. Use 3rd person only; no 1st or 2nd person writing style will be accepted.