



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Forestry and Wood Technology

FWT 303 – Forest Survey

COURSE PARTICULARS

Course Code: FWT 303

Course Title: Forest Survey

No. of Units: 2

Course Duration: One hour of theory and three hours of practical per week for 15 weeks.

Status: Compulsory

Course Email Address: fwt303@rediffmail.com

Course Webpage: <http://www.fwt.futa.edu.ng/courseschedule.php?coursecode=FWT%20303>

Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

This course is designed to trained students on how to carry out the survey of forest lands using some simple survey equipment such as compass, chain, poles, arrows, field books, optical instruments etc and simple construction surveying for rural applications. The students are practically exposed to various survey equipments and how to handle them. Students are also trained on how to produce the map of an area that has been surveyed, closing of errors in maps and computation of land areas from a map using different methods. Some of the topics to be covered include procedures in ground survey and ground survey instruments. Chain surveying (open and close traversing) and triangulation, Obstacles in chain survey, how to overcome them and the various sources of errors during survey exercise. Others are Compass survey: function, limitations and use during survey exercise and sources of errors, plotting of survey maps, plans and methods of area calculations, lettering and conventional signs, levelling and contours, plane tabling, the Theodolite: uses in tachimetry and Forest road alignment.

COURSE OBJECTIVES

The objectives of this course are to:

- introduce students to the use of some survey equipments; and
- provide students with opportunities to develop their basic skills in land survey and simple construction surveying using the available simple instruments, plotting of maps and area computation from maps.
- train students on how to design and supervise the construction of forest/rural roads
- produce practical oriented students in levelling and production of contour lines and survey maps

COURSE LEARNING OUTCOMES / COMPETENCIES

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

(Knowledge based)

- identify and use some survey equipment such as chain, level, theodolite, compass etc, carry out the survey of any location with these instruments, produce map from the survey data and estimate the area of the land from the map;
- understand the principle behind the estimation of the relative difference in the heights of points on the earth surface and how to obtain spot heights above the Mean Sea Level
- understand the purpose and functions of road construction and maintenance in renewable natural resources management;
- carry out efficient land demarcation on maps and lands;

(Skills)

- use the survey and plotting equipments to survey a given land area and represent same in form of a map or plan
- estimate the area of the map using some standard methods such as give & take, triangular method, strip method, counting of square method, Simpson rule etc
- use planimeter to estimate the area of a map
- carry out land demarcation for various land use options;
- carry out levelling with levelling equipments (e.g. dumpy level and cross staff) to obtain the relative heights of points on earth surface
- produce a contour map of a given area;
- use the teodolite to carry out a simple survey work
- carry out a plane tabling type of survey on the field

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	5%
Assignments	15%
practical	30%
<u>Final Examination</u>	<u>50%</u>
<u>TOTAL</u>	<u>100%</u>

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must send his/her notification of absence in writing or sms as soon as possible to the instructor, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook and all the students involved will score zero in that particular work.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn the student zero for that assignment. Only under justifying circumstances, for which a student has notified the instructor (in writing/sms) in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, etc.) during lectures. Food and drinks are not permitted in the laboratories.

READING LIST

- 1 Bannister, A., Raymond, S. & Baker, R. (1992). Surveying. Longman Scientific and Technical, UK 494p
- 2 Crawford, W. G. (1994). *Construction surveying and Layout: step by step manual* by POB Publishing company, Canton, Mi USA 730p.
- 3 Loedeman, J. H. (2000): *Simple construction surveying for rural application*. 2nd & completely revised edition. Agrodok-Series No. 6, CTA Netherlands 96p.

Note: These texts are available in the University Library, Departmental/School Libraries and in local bookshops. Additional materials can be obtained on the internet.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and Course Overview <ul style="list-style-type: none"> - definition and types of survey - role of survey to renewable natural resources management 	During this first class, the expectation of the students from the course will also be documented.
2 & 3	Simple survey equipments, features and uses: <ul style="list-style-type: none"> • Chains, compass, • poles, • arrows, • optical instruments, • plum bobs, • field books, • tapes etc 	Practical exercise will involve the use of each of these equipments by every student.
4 & 5	Errors in chaining, causes and the remedies Obstacles in chain and compass survey and how to overcome them: <ul style="list-style-type: none"> • Vision obstructed, chaining free e.g. rising ground or hill • Vision free, chaining obstructed e.g. pond, stream or river. • Both vision and chaining obstructed Estimation of obstructed chain length using the Pythagoras theorem, similar triangles and other geometric principles	The student will be introduced to the various sources of error during chain survey exercise on the field. The causes of these errors and how to mitigate them will be explained one by one. Practical: The students will demonstrate the use of chain to set a perpendicular line to a chain line in an attempt to overcome survey obstacles. Practical exercises will be given to demonstrate the use of this theorem and mathematical principles
6	Procedures for chain and compass survey <ul style="list-style-type: none"> - Reconnaissance survey - Actual field work - Representation in form of map or plan - Off-set measurement and recording on field book 	The three stages in survey work will be explained. After this class, the students should be ready to go out for practical survey exercise on group basis.
7 & 8	Plotting small survey map or plan <ul style="list-style-type: none"> - Introduction to plotting materials such as drawing paper, pens, nips & inks, pencil, drawing board, set-squares (60 & 45 degrees), protractor, compass and divider, sharpeners and eraser etc. - Closing errors - Tracing and Lettering 	Students will be requested to prepare a plan/map of surveyed plots, close the error, trace on tracing paper with drawing pen and do the lettering. Every student is expected to submit his job as an assignment.
9 & 10	Computation of areas of map or plan using <ul style="list-style-type: none"> • Give & Take • Counting of squares • Construction of grid lines • Simpson rule • Triangular method • Planimeter 	Students will be taught on efficient use of these methods for area computation of land area from map/plan. Area of the plotted map by individual will be estimated with these methods

11 & 12	<p>Leveling and contour</p> <ul style="list-style-type: none"> • Introduction to leveling equipments • Types and importance of levelling and contour lines • Some leveling terminologies e.g. Reduce level, level surface, line of sight, Mean Sea Level, Datum, Bench mark, • Procedure for carrying out levelling • Sources of errors in levelling and the precautions 	<p>Students will be divided into groups and allocated areas where levelling will be carried out. This will test their understanding of the topic and how to use all levelling equipments.</p>
13 & 14	<p>Plane tabling</p> <ul style="list-style-type: none"> • Major importance of plane tabling • Limitation of plane tabling • Types of plane tabling • Procedure for plane tabling <p>Theodolite survey</p> <ul style="list-style-type: none"> • Introduction to the theodolite • The use of theodolite as survey equipment 	<p>The orientation and centering of the theodolite for accurate result will be demonstrated</p>
15	REVISION	<p>This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students' expectations for the course have been met.</p>