



**A) COURSE**

Course Id:	Course
5980	TOPOGRAPHY

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
4	0	4	8	64 hrs. 0 hrs. lab. 64 total hours.

**B) GENERAL COURSE INFORMATION:**

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
<b>Level:</b>		VII			
<b>Course Type (Required/Elective)</b>		ELECTIVE			
<b>Prerequisite Course:</b>		Required to have approved at least 360 credits			
<b>CACEI Classification:</b>		IA			

**C) COURSE OBJECTIVE**

**At the end of the course, the student will be capable of:**

You will learn some topographic calculations that allow to obtain very clear knowledge about the horizontal and vertical control of any mechanical equipment.

**D) TOPICS (CONTENTS AND METHODOLOGY)**

1. PLANIMETRIC SYSTEMS.		<b>40 Hours</b>
Specific Objective:	<b>Students apply geometric and trigonometric concepts, as well as the use of topographic surveys team, to develop a plan with the help of the relevant calculation.</b>	



- 1.1. basic principles (3 hrs).
  - History of the topography
  - Definition of the topography
  - Classification of topographical surveys
  
- 1.2. measuring tape (5 hrs).
  - General Idefiniciones
  - Measurements with longímetros on flat and rough terrain.
  - Measurements errors
  - Resolution of problems in the field: outline of perpendicular, parallel, prolongation of alignments, stroke of an angle with tape, etc.
  - Lifting a polygonal closed with tape. Method: triangulation
  - Interior angles, error and angular offset, offset Interior angles and analytic surface calculation
  - Preparation of a plane by the graphic method
  
- 1.3 compass (5 hrs).
  - Description of the compass
  - Conditions that must meet the compass
  - Types of compasses according to their characteristics
  - Definitions: direction, azimuth and
  - Decline
  - Lifting a polygonal with a compass and tape, record of field and office
  - Error, tolerance and angular compensation
  - Calculation of Interior angles in function: directions and azimuths
  - Angular adjustment
  - Calculate directions based on compensated Interior angles and a baseline
  - PREPARATION OF A PLANE BY A GRAPHIC METHOD
  
- 1.4 I transit (3 hrs).
  - Description
  - Types of transit, theodolite and total station
  - Use of transit
  
- 1.5 methods of rising of a POLYGONAL topographic team (24 Hrs.)
  - Lifting of a polygon Interior angles, magnetically oriented a line
  - RECORDS IN FIELD AND CALCULATION
  - THEORY OF ERRORS, TOLERANCES AND ANGULAR AND LINEAR COMPENSATION
  - CALCULATION OF COORDINATES.
  - CALCULATION OF THE BOX CONSTRUCTION
  - LIFTING OF A POLYGON BY THE METHOD OF CONSERVATION OF AZIMUTH.
  - RECORDS IN FIELD AND CALCULATION
  - THEORY OF ERRORS, TOLERANCES AND ANGULAR AND LINEAR COMPENSATION
  - CALCULATION OF COORDINATES.

<b>Readings and other resources</b>	Articles, books, Internet, complementary bibliography.
<b>Teaching Methodologies</b>	Exhibition in class, analyses of the exposed concepts, resolution of exercises and collaborative work. Traditional practices directed, project-oriented learning.
<b>Learning Activities</b>	Dynamics of working in team, assignments, and discussion of these. Studies of reproducibility and repeatability, estimation error, uncertainty, calibration. Analysis of readings and presentations in Powerpoint.

<b>2. ALTIMETRIC SYSTEMS</b>	<b>24 Hours</b>
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<b>Specific Objective:</b>	<b>OBJECTIVE: THE STUDENT WILL LEARN FIELD PROCEDURES AND CALCULATION FOR LEVELING AND ITS APPLICATIONS IN THE PLACING OF MACHINERY AND SPECIAL EQUIPMENT.</b>
<p>2.1 BASIC CONCEPTS TIME (2 HRS.)</p> <ul style="list-style-type: none"> <li>• GENERAL DEFINITIONS</li> <li>• CLASSIFICATION OF THE LEVELING</li> <li>• DESCRIPTION OF THE TRIGONOMETRIC LEVELING</li> <li>• DESCRIPTION OF THE BAROMETRIC LEVELING</li> <li>• DESCRIPTION OF DIRECT LEVELING</li> <li>• TYPES OF LEVEL</li> <li>• MANAGEMENT OF LEVEL</li> </ul> <p>2.2 AUTOMATIC LEVEL (2 HRS.)</p> <ul style="list-style-type: none"> <li>• DESCRIPTION</li> <li>• TYPES OF LEVEL</li> <li>• USE OF THE LEVEL</li> </ul> <p>2.3. LEVELING (20 HRS.)</p> <ul style="list-style-type: none"> <li>• DIFFERENTIAL LEVELING</li> <li>• SPECIFICATIONS FOR DIFFERENTIAL LEVELING</li> <li>• RECORD FROM FIELD AND CALCULATION</li> <li>• LEVELING OF IDA Y REGRESO</li> <li>• TOLERANCE ON A SLOPE               <ul style="list-style-type: none"> <li>• APPLICATIONS</li> </ul> </li> </ul>	
<b>Readings and other resources</b>	Articles, books, Internet, complementary bibliography.
<b>Teaching Methodologies</b>	Exhibition in class, analyses of the exposed concepts, resolution of exercises and collaborative work. Traditional practices directed, project-oriented learning.
<b>Learning Activities</b>	Dynamics of working in team, assignments, and discussion of these. Studies of reproducibility and repeatability, estimation error, uncertainty, calibration. Analysis of readings and presentations in Powerpoint.

**E) TEACHING AND LEARNING METHODOLOGIES**

**F) EVALUATION CRITERIA:**

Evaluation:	Schedule	Suggested Form of Evaluation and weighing	Topics
1er. Evaluación Parcial			
2º Evaluación Parcial			
3er. Evaluación Parcial			
Evaluación Final Ordinario			
Otra Actividad:			
Examen Extraordinario	Semana 17 del semestre en curso	100% Examen	100% Temario
Examen a título	De acuerdo a programación de Secretaría Escolar	100% Examen	100% Temario
Examen de regularización	De acuerdo a	100% Examen	100% Temario



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	programación de Secretaría Escolar		
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**G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES**

**Main Books**

RUSELL C. BRINKER / PAUL R. WOLF "TOPOGRAFÍA MODERNA" ED. HARLA, MÉXICO. 6A. ED. 1982.

MONTES DE OCA MIGUEL "TOPOGRAFÍA" ED. REPRESENTACIONES Y SERVICIOS DE INGENIERÍA. MÉXICO, 1970

HARRY PARKER Y JOHN W. MACGUIRE "INGENIERÍA DE CAMPO SIMPLIFICADA" LIMUSA, 4A IMPRESIÓN 1984.

**Complementary Books**

R. WIRSHING JAMES Y H. WIRSHING ROY "TOPOGRAFÍA MODERNA" SERIE SCHAUM ED. MC. GRAW-HILL.

TOSCANO RICARDO MÉTODOS TOPOGRÁFICOS" ED. PORRUA S.A.

KISSAM PHILIP "TOPOGRAFÍA PARA INGENIEROS" ED. MCGRAW-HILL

**Internet Links**