

Photogrammetry (CE 474) [0]

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Course Objectives

This course aims at achieving the objectives:

- Provide the student with an introduction to the principles of photogrammetry.
- Data collection using Photogrammetric methods.
- Applications of photogrammetry in map projection.
- Applications of photogrammetry in civil engineering projects.
- Give the student sufficient training on photogrammetric instruments and at least one of the modern photogrammetric software's.

Course Topics

- The history of photogrammetry
- Aerial cameras and camera calibration
- Geometry of the aerial photograph
- Stereoscopy and stereoscopes
- Parallax and the theory and techniques of plotter orientation
- Extraction of engineering information from single aerial photo and two interfaced photos
- Least squares, preparation and measuring of coordinates from aerial photos
- Planning a photogrammetric project
- Applications using computer software's

Student's duties

1. Students are required to attend lectures in regular base.
2. Students are asked to revise in advance the contents of the course.
3. Participating in the discussions and solving the exercises is a must for all the students. Consulting the course teacher at any time during the office hours.

Contents (week by week)

Week	Subject	Content
1 st week	<i>History of photogrammetry</i>	<ul style="list-style-type: none">• What is photogrammetry?• Historical Perspective• Terminology• Image Formation

Contents (week by week)

Week	Subject	Content
2 nd week	<i>Aerial cameras and</i>	<ul style="list-style-type: none">• Types of aerial cameras
3 rd week	<i>Camera Calibration</i>	<ul style="list-style-type: none">• Camera calibration

Contents (week by week)

Week	Subject	Content
4th week	Geometry of the aerial photograph	<ul style="list-style-type: none">• Principles points• Ground points• Control points• Central Projection• Interior and Exterior Orientation• Image Capture Practicalities
5th week		

Contents (week by week)

Week	Subject	Content
6 th week	Stereoscopy and stereoscopes	<ul style="list-style-type: none">• Stereoscopy
7 th week		<ul style="list-style-type: none">• Stereoscopes• exercise• lab work

Contents (week by week)

Week	Subject	Content
8 th week	Parallax theory and techniques of plotter orientation	<ul style="list-style-type: none">• Parallax• Theory and techniques• Plotter orientation

1st mid term exam

- The exam will be announced by the college.
- Total marks for this exam is : **15 marks**

Contents (week by week)

Week	Subject	Content
9 th week	Extraction of engineering information from single aerial photo	<ul style="list-style-type: none">• What engineering information that can be extracted from aerial photos?• How do you extract engineering information from a single photo?

Contents (week by week)

Week	Subject	Content
10 th week	Extraction of engineering information from two aerial photo	<ul style="list-style-type: none">• method• exercise• Project #1 (Digital Terrain Model)

Contents (week by week)

Week	Subject	Content
11 th week	<i>Least squares, preparation and measuring of coordinates from aerial photos</i>	<ul style="list-style-type: none">• Introduction• Least square method• Coordinates• Measuring of coordinates from aerial photos

Contents (week by week)

Week	Subject	Content
12 th week	<i>Planning a photogrammetric project</i>	-Introduction to analytical photogrammetric surveying - Project #2

2nd mid term exam

- **The exam will be announced by the college.**
- **Total marks for this exam is: 20 marks**

Contents (week by week)

Week	Subject	Content
13 th week	<i>Project #2</i> <i>Cont.</i>	<ul style="list-style-type: none">• Getting information• Writing a project

Contents (week by week)

Week	Subject	Content
14 th week	<i>Applications using computer software's</i>	<ul style="list-style-type: none">• Constructing of contour maps using suitable photogrammetry software

Grading Policy

Grading Component	Marks	Exam Date
Mid Exam (1)	15 %	To be announced
Mid Exam (2)	20%	To be announced
Quizzes	15%	
Reports, Assignments, HWs	10%	
Final exam	40%	
Total	100%	

Textbook and References

Textbook:

Paul R. Wolf, "**Elements of Photogrammetry**", Mc Graw Hill, (Latest edition).

References:

Burr, F. K. and Glemen Bird, S. J., "Surveying, Principles and Applications", Prentice Hall, 2000.

C. Burnside, "Mapping from Aerial Photographs", Tranada Publishers. (Latest edition).