COURSE CODE: **GIE-306**

COURSE NAME: **CARTOGRAPHY AND MAP PRODUCTION**

CREDIT HOURS:

Theory	= 02
Practical	= 01
Total	= 03

CONTACT HOURS:

Theory	= 32
Practical	= 48
Total	= 80

PREREQUISITES: Nil

MODE OF TEACHING:

Instruction:	Two hours of lecture per week	67%
Practical:	Three hours of Lab work per week	33%

COURSE DESCRIPTION:

This course introduces map design in three parts: graphic design and typography, reference map design and production and design principles and contemporary media. Through lessons that offer conceptual explorations of mapping sciences and arts, and examples of both well- and poorly designed maps that illustrate mapping techniques, students will learn the intricacies of map production, for both printed and electronic display. A lab component is included to provide students with opportunities to make their own maps and practice cartographic representation, graphic design, web design, and map production. The labs are based on ArcGIS and Cartographic software.

COURSE OBJECTIVES:

The subject provides basic knowledge of portraying spatial features from reality by using cartographic techniques. Subject incorporates the fundamentals of map reading, map making, coordinate and projection systems, map symbolization and generalization, Map production and map classification techniques.

RELEVANT PROGRAM LEARNING OUTCOMES (PLOs):

The course is designed so that students achieve following PLOs:

1	Engineering Knowledge:	☑	7	Ethics:	☐
2	Problem Analysis:	☐	8	Individual and Collaborative Team Work:	☑
3	Design/Development of Solutions:	☐	9	Communication:	☐
4	Investigation:	☐	10	Project Management:	☐
5	Tool Usage:	☑	11	Lifelong Learning:	☐
6	The Engineer and Society:	☐			

COURSE LEARNING OUTCOMES (CLOs):

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

No.	CLO	Domain	Taxonomy Level	PLO
1	Describe various spatial models and map production methods used in cartography	Cognitive	2	1
2	Apply cartographic techniques for map	Cognitive	3	5

	making using various GIS software.			
3	Commit to contribute as a team member to design maps of different themes using optimal cartographic techniques.	Affective	3	8

PRACTICAL APPLICATIONS:

This course will enable student to geo-visualize the data in both graphical and spatial form.

TOPICS COVERED:

Theory:

Week	Topics
1	Nature of Cartography
2	History of Cartography
3	Map Distortions
4	Cartographic Design
5-6	Color Theory and Models
7	Color and Pattern use
8	Typography and Lettering the Map
9	Map Compilation
10	Selection and Generalization Principles
11	Symbolization
12	Map Production, and latest trends
13	Standards for land cover/land use classification schemes
14	Cartography and Ethics
15	Map Production in National and International Organizations (Survey of Pakistan, Food and Agriculture Organization (FAO), United States Geological Survey (USGS), Coordination of Information on the Environment (CORINE).
16	Latest Trends and Modern Cartographic Project Examples /Workflows for producing large scaled tiled maps, using AI (GAN)
17-18	**ESE**

Practical:

No.	Topic
1	Basic Cartographic lettering
2	Map design
3	Map projections application
4	Map projection comparison
5	Exploring map text options (table, annotation)
6	Identify colour characteristics, colour space
7	Practice mixing colours
8	Data classification & presentation
9	Map density & presentations
10	Symbolization; Map customization
11	Presentation maps; Map catalogue
12	Visits to Professional Organizations and Industry i.e. Survey of Pakistan, UN-Habitat, Digital Mapping Unit etc.

TEXT AND MATERIAL:

Textbook (s)

a. Cartography: Thematic Map Design (6th Edition) byJeffTorguson and Thomas W. Hodler, 2008, W. C. Brown Pub. Co. ISBN13: 978-0072943825.
b. Elements of Cartography, (6th Edition) by Robinson, A.H., Morrison,J.L., Muhrcke, A.J.,KimerlingandGuptil,S.C., 1995, John Wiley &Sons, New York.

References Material:

a. Mapping: A Critical Introduction to Cartography and GIS by Crampton, Jeremy W. 2010. ISBN: 1405121726
b. Thematic Cartography and Geographic Visualization, (2nd Edition) Slocum, Robert McMaster, Fritz Kessler, Hugh Howard, 2004, Terry. ISBN, 0130351237.
c. Digital Cartography by Robert G. Cromley, 2003, Prentice Hall Inc.
d. Cartography- Visualization Data by M.J. Kraak & F.J. Ormeling, 1996, Addison Wesley Longman Limited.
e. Cartography, Visualization of Spatial Data (2ndEdition), by Menno-Jan Kraak, FerjanOrmeling, 2002, ISBN 0130888907.
f. Cartography with ArcView GIS and Map Projection, (5thEdition) 1998, AMAZON.
g. Cartography: Thematic Map Design, (5thEdition), 1998, AMAZON.
h. Multimedia Cartography, (1stEdition), 1999, AMAZON.

ASSESMENT SYSTEM:

1. **CLOs Assessment**

Cognitive	**Psychomotor**	**Affective**
Spreadsheet		Rubrics

2. **Relative Grading**

Theoretical / Instruction			67%
	Assignments 10%		
	Quizzes 10%		
	Mid Semester Exam 30%		
	End Semester Exam 50%		
Practical Work			33%
Laboratory Work		*70%*	
	Laboratory Attendance 20%		
	Laboratory Report 20%		
	Laboratory Quiz 30%		
Viva/Quiz		*30%*	
Total			**100%**