

Course Title: Geographical Information System (3 Cr.)

Course Code: CACS454

Year/Semester: IV/VIII

Class Load: 5 Hrs. / Week (Theory: 3Hrs. Practical: 2 Hrs.)

Course Description

This course offers detailed knowledge as well as practical skills on GIS theory, design and implementation. It includes introduction, GIS and Map, GIS data sources and structures, spatial data analysis, GIS data modeling and creating map apart from this this encourages to students to develop a real time basic GIS project.

Course objectives

The general objectives of this course are to provide theoretical knowledge as well as practical skills of geographical information system to make students capable of capturing, analyzing and visualize real world data.

Course Contents

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| Unit 1: Introduction | 6 Hrs. |
| 1.1 Definition, functions and Applications of GIS | |
| 1.2 Components of GIS | |
| 1.3 GIS as Information System | |
| 1.4 Nature & Sources of GIS data | |
| 1.5 Recent trends and future of GIS | |
| Unit 2: GIS and Map | 8 Hrs. |
| 2.1 Map and their characteristics | |
| 2.2 Mapping concept and Techniques | |
| 2.3 Map Projection | |
| Unit 3: GIS data Sources & Structures | 12 Hrs. |
| 3.1 Capturing GIS data | |
| 3.2 Sources: Maps, GPS, Images and Databases | |
| 3.3 Structures: Vector, Raster and TIN data structures | |
| 3.4 GIS data modeling | |
| 3.5 GIS database design | |
| Unit 4: Spatial Data Modeling and Analysis | 12 Hrs. |
| 4.1 Spatial data modeling | |
| 4.2 Vector based analysis | |
| 4.3 Raster based analysis | |
| Unit 5: GIS data modeling & Creating Maps | 10 Hrs. |
| 5.1 Surface modeling | |
| 5.2 Hydrology modeling | |
| 5.3 Designing and printing the map | |



V. Shrestha



Laboratory Works

Students should develop basic GIS project implementing the concepts given in course of study and may add more (if required).

Teaching Methods

The teaching faculties are expected to create environment where students can update and upgrade themselves with the current scenario of computing and information technology with the help of topics listed in the syllabus. The general teaching pedagogy that can be followed by teaching faculties for this course includes class lectures, laboratory activity, group discussions, case studies, guest lectures, research work, project work, assignments (Theoretical and Practical), and written and verbal examinations.

Evaluation

Examination Scheme				
Internal Assessment		External Assessment		Total
Theory	Practical	Theory	Practical	
20	20 (3 Hrs.)	60 (3 Hrs.)	-	

Reference Books

1. Kang-tsung Chang, (2010). "Introduction to Geographic Information Systems" Tata McGraw Hill, New Delhi.
2. C.P.Lo and Albert K.W.Yeung (2006). "Concepts and Techniques of Geographic Information Systems" Prentice Hall of India, New Delhi.
3. Albert, C.T.L. and Yeung, K.W. (2002). "Concepts and Techniques of Geographical Information Systems", New Delhi: Prentice Hall.
4. Chakraborty, D. and Sahoo, R.N. (2007). Fundamentals of GIS. India: Viva Books.
5. ESRI guide to GIS analysis Andy Mitchell, ESRI press, Red lands

