

Program Educational Objectives (PEOS):

- PEO1:** To prepare students to develop a strong background in geo-informatics, remote sensing and navigational surveying and in software development/IT, IT related areas/IoT.
- PEO2:** To train the students in developing practical solutions to the problems of the society using the cutting- edge technology.
- PEO3:** To develop professional competence in students through life-long learning and professional experience.
- PEO4:** To maintain state-of the art R&D facilities for constant improvement in the quality of education research and development.
- PEO5:** To train the students in coding related activities of Geospatial Technology

II

Program Objectives (POS):

- PO1:** Ability to independently carry out research /investigation and development work to solve practical problems
- PO2:** Ability to write and present a technical report/document
- PO3:** Students should be able to demonstrate a higher degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- PO4:** Shall be able to employ necessary techniques, advanced equipment and software tools for state of the art engineering methodologies for natural resources management.
- PO5:** To Develop Programming skills among Geospatial Technologies for Employment opportunity.

Program Specific Outcomes (PSOs):

- PSO1:** Import knowledge of Geospatial Technologies as basic objective of education.
- PSO2:** To apply design principles and best practices for developing quality products for Geospatial Technologies applications.
- PSO3:** To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel.
- PSO4:** A Scientific attitude to make students create open minded and curiosity.
- PSO5:** Develop skills in practical work, softwares,equipments in laboratory use along with collection and interpretation of Geospatial data.

M. TECH SEM -I**SEMESTER-I****PROGRAMME CORE-I / SIT- 01
PHOTOGRAMMETRY& REMOTE SENSING****COURSE OUTCOMES:**

- The student will be familiar with
- CO 1. The basic concepts of remote sensing.
 - CO 2. Satellites and sensors.
 - CO 3. Working principles of and issues related to microwave sensors, LiDAR.
 - CO 4. The basics of photogrammetry, and
 - CO 5. The fundamentals and working principles of digital photogrammetry.

**PROGRAMME CORE-II/ SIT -02
GEOGRAPHIC INFORMATION SYSTEMS**

2

COURSE OUTCOMES:

- The students will have sound background in the following aspects of GIS
- CO 1. Fundamentals of GIS.
 - CO 2. Various types of GIS data model including devices.
 - CO 3. Familiarization with various data types, editing and storage.
 - CO 4. Concepts and components of DBMS and entity modeling, and
 - CO 5. Exposure to data mining and data marts.

3

LARGE SCALE TOPOGRAPHIC MAPPING**COURSE OUTCOMES:**

- The student will have
- CO 1. Exposure to concept and various facets of mapping.
 - CO 2. Familiarity with map projections.
 - CO 3. Acquaintance with various elements of surveying.
 - CO 4. Familiarity with mapping, and
 - CO 5. Insight into various steps involved in map preparation including cartography.

4

CONCEPTS OF BIG DATA AND ITS APPLICATIONS**COURSE OUTCOMES:**

- Students will be able to
- CO 1: Have sound background in Big data
 - CO 2: Have sound background in Data science
 - CO3: Familiarize with the use of the Big Data-case studies
 - CO4: Execute the Queries, and
 - CO5: Comprehend Big data applications

TERRAIN MODELLING

COURSE OUTCOMES:

The students will have exposure to

- CO1: Basic concepts of terrain modelling.
- CO2: Methods of acquisition.
- CO3: Terrain surface modelling.
- CO4: Data quality control
- CO5: Multi Scale representation of DEM.

6

GEODESY

COURSE OUTCOMES:

The students will be able

- CO1: Introduce the fundamental concepts of reference co-ordinate systems, time and signal propagation.
- CO2: Fundamentals of satellite orbital motion.
- CO3: Working principles of satellite orbital motions and GPS receivers.
- CO4: Processing navigational data and assessment of error budget, and
- CO5: Knowledge of the role of permanent reference points in the context of satellite navigation, networks and its applications.

7

WEB-GIS

COURSE OUTCOMES:

The student will be able to

- CO1: Comprehend basic programming including HTML & CSS to implement high quality web mapping applications.
- CO2: Familiarize with the usage of Java Script for form validation of web page
- CO3: Gain an understanding of the basic concepts of programming using web GIS
- CO4: Have the basic knowledge of techniques to distribute, process and display geographical data in the Internet environment, and
- CO5: Develop the skill for publishing the geospatial data

8

WEB TECHNOLOGIES

COURSE OUTCOMES:

The student will have exposure to

- CO1: Concepts of scripting languages.
- CO2: HTML 5 and CSS3.
- CO3: DotNET frame work.
- CO4: Customized web services.
- CO5: GeoServer and Open layers.

9

GIS LABORATORY

COURSE OUTCOMES:

The students will be able to

- CO1: Prepare remote sensing data for analysis/ interpretation, and will be familiar with the topographic maps and thematic maps.
- CO2: Prepare base maps.
- CO3: Develop different thematic maps like drainage map, slope map, watershed map and landuse / landcover map.
- CO4: To analyze the change in terrain features/ land use/ land cover from multi-temporal and multispectral data, and map updation.
- CO5: Carry out GPS survey.

SOFTWARE DEVELOPMENT LABORATORY

COURSE OUTCOMES:

The student will be able to

- CO1: Handle the implementation of programming concepts of Dot Net.
- CO2: Learn the usage of Type conversion techniques.
- CO3: Gain an understanding of the basic concepts of OOPS.
- CO4: Have the basic knowledge of different windows services.
- CO5: Gain hands-on experience in Handling of Assemblies in DotNet.

11

RESEARCH METHODOLOGY AND IPR

COURSE OUTCOMES:

Students will be able to

- CO1: Understand research problem formulation.
- CO2: Analyze research related information
- CO3: Follow research ethics
- CO4: Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
- CO5: Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasize the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
- CO6: Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

12

ENGLISH FOR RESEARCH PAPER WRITING

COURSE OUTCOMES:

Students will be able to:

- CO1: Understand that how to improve your writing skills and level of readability
- CO2: Learn about what to write in each section
- CO3: Understand the skills needed when writing a Title
- CO4: Ensure the good quality of paper at very first-time submission

13

DISASTER MANAGEMENT

COURSE OUTCOMES:

Students will be able to:

- CO1: Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
- CO2: Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
- CO3: Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
- CO4: Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in

SANSKRIT FOR TECHNICAL KNOWLEDGE

COURSE OUTCOMES:

Students will be able to

CO1: Understand basic Sanskrit language.

CO2: Understand Ancient Sanskrit literature about science & technology.

CO3: Develop logic in students being a logical language.

15

VALUE EDUCATION

COURSE OUTCOMES:

Students will be able to

CO1: Gain knowledge of self-development

CO2: Learn the importance of Human values

CO3: Develop the overall personality

16

ADVANCED DIGITAL IMAGE PROCESSING

COURSE OUTCOMES:

The students will have

CO1: Exposure to various image restoration techniques.

CO2: Comprehend various image enhancement techniques.

CO3: Thorough understanding of the procedures for image interpretation.

CO4: Familiarity with hyperspectral data and its analysis, and

CO5: Exposure to change detection and accuracy assessment.

17

REMOTE SENSING APPLICATIONS

COURSE OUTCOMES:

The students will be able to know

CO1: Role of remote sensing in the management of land resources

CO2: Role of remote sensing in the management of Vegetatal Resources

CO3: Water resource management by Remote sensing techniques

CO4: Remote sensing of environment, and

CO5: Basic concept and types of natural disasters, and the role remote sensing plays in natural disaster management.

18

GLOBAL NAVIGATION SATELLITE SYSTEM

COURSE OUTCOMES:

The students will have exposure to

CO1: Satellite geodesy.

CO2: Overview of positioning and basic physical concept.

CO3: In depth knowledge of navigational satellite system.

CO4: Navigational satellite data processing and techniques.

CO5: Applications of Satellite Geodesy

EARTH OBSERVATION SYSTEMS

COURSE OUTCOMES:

The students will have exposure to

- CO1: Existing and emerging earth observation system.
- CO2: Various satellite platforms
- CO3: IRNNS program and its data processing
- CO4: Satellite data structures
- CO5: Currently operating and future GEOS

OBJECT ORIENTED PROGRAMMING CONCEPTS

COURSE OUTCOMES:

The students will have exposure to

1. Concept of classes, objects and files.
2. Working with files and strings.
3. To provide an overview of Java and its packages
4. Concept of Java AWT controls, Layouts.
5. To familiarize the students working with Javascript.

SPATIAL DATABASE CREATION

COURSE OUTCOMES:

The students will have exposure to

- CO1: Various types of thematic maps
- CO2: Production of map's
- CO3: Database creation & Redundancy
- CO4: Various types of database systems
- CO5: Creation and management of database

22

PYTHON SCRIPT PROGRAMMING

COURSE OUTCOMES:

The student will have exposure to

- CO1: Fundamentals of PYTHON
- CO2: Familiar with various elements of Python script programming, namely OOPS
- CO3: Integration of Modules and regular expression in PYTHON.
- CO4: Data base programming
- CO5: With abovementioned background they will be able to develop small application

23

ADVANCED GEOSPATIAL TECHNOLOGIES

COURSE OUTCOMES:

The students will have

- CO1: Exposure to Web and internet GIS.
- CO2: Familiarization with centralized and distributed web GIS applications frame work.
- CO3: Grasp of web services in GIS domain.
- CO4: Working knowledge of web mapping application development tools.
- CO5: An idea about web mapping services and open source GIS software.

M. TECH SEM -II

24

DIGITAL IMAGE PROCESSING LABORATORY

COURSE OUTCOMES:

The students will have hands –on experience in

- CO1: Data preparation for image analysis
- CO2: Various types of digital image enhancements.
- CO3: Different digital image fusion techniques.
- CO4: Digital image analysis- unsupervised and supervised approaches.
- CO5: Change detection techniques and spatial model maker.

GNSS & IN-SITU DATA COLLECTION**COURSE OUTCOMES:**

Students will be able to

- CO1: Familiarize various contents of GNSS
- CO2: Handling of the DGPS & RTK'S
- CO3: Handling of RTKP
- CO4: Able to Handle different file formats
- CO5: Integrate Remote sensing data with GNSS

26

MINI PROJECT

The mini project will be based on the work done during the industrial training/internship of two months provided during semester break.

COURSE OUTCOMES:

- CO1: Students will get an opportunity to work in actual industrial environment if they opt for internship.
- CO2: In case of mini project, they will solve a live problem using software/analytical/computational tools.
- CO3: Study different techniques used to analyze complex systems
- CO4: Students will learn to write technical reports.
- CO5: Students will develop skills to present and defend their work in front of technically qualified audience.

CONSTITUTION OF INDIA

COURSE OUTCOMES:

Students will be able to:

- CO1: Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- CO2: Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- CO3: Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
- CO4: Discuss the passage of the Hindu Code Bill of 1956.

PEDAGOGY STUDIES

COURSE OUTCOMES:

Students will be able to understand:

- CO1: What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
 CO2: What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
 CO3: How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

29

STRESS MANAGEMENT BY YOGA

COURSE OUTCOMES:

Students will be able to:

- CO1: Develop healthy mind in a healthy body thus improving social health also
 CO2: Improve efficiency

30

PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS

COURSE OUTCOMES:

Students will be able to

- CO1: Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
 CO2: The person who has studied Geeta will lead the nation and mankind to peace and prosperity
 CO3: Study of Neetishatakam will help in developing versatile personality of students.

M.TECH SEM -III

3 IV-b

DRONE-FLYING AND DATA ANALYSIS

COURSE OUTCOMES:

The students will have exposure to various components of Drones including

- CO1: Data collection by UAV'S.
 CO2: Surveying with drones.
 CO3: Concepts of Image processing techniques.
 CO4: Modelling and mapping by drone data.
 CO5: Applications of drones.

STATISTICS AND COMPUTATION**COURSE OUTCOMES:**

The students will have exposure to

CO1: A thorough understanding of

measurements and their analysis.

CO2: Comprehension of Random

Error Theory

CO3: Hypothesis Testing.

CO4: To Error Propagation in Traverse Surveys.

CO5: Comprehension of Neural Network and Fuzzy Logic.

WEB DEVELOPMENT

COURSE OUTCOMES:

The students will have exposure to

- CO1: Fundamentals of HTML5.
- CO2: Various types of tags in HTML5.
- CO3: Familiarization with CSS3.
- CO4: Concepts and working knowledge in DotNet
- CO5: Concepts and creation of web services.

34

BUSINESS ANALYTICS

COURSE OUTCOMES:

Students will be able to

- CO1: Demonstrate knowledge of data analytics.
- CO2: Think critically in making decisions based on data and deep analytics.
- CO3: Use technical skills in predicative and prescriptive modeling to support business decision-making.
- CO4: Translate data into clear, actionable insights.

36

OPERATIONS RESEARCH

COURSE OUTCOMES:

The student should be able to

- CO1: Students should be able to apply the dynamic programming to solve problems of discrete and continuous variables.
- CO2: Students should be able to apply the concept of non-linear programming
- CO3: Students should be able to carry out sensitivity analysis
- CO4: Student should be able to model the real world problem and simulate it.

40

OPEN ELECTIVES (OE) SIT-18 GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS (GEOS)

Course Outcomes:

At the end of semester the students will have exposure to various components of GEOS including

- CO 1. Platforms and Instrumentations.
- CO 2. Current and future earth observation missions operating in optical domain..
- CO 3. Earth observation missions operating in microwave domains
- CO 4. The concept of satellite data structure and processing levels.
- CO 5. Science products and sources of EOS data.

41

OPEN ELECTIVES (OE) SIT-18

Course Outcomes:

At the end of semester the students will have exposure to various components of AI & ML with respect to Geomatics including

- CO 1. Concepts of Artificial Intelligence basics.
- CO 2. Integration of Problem solving techniques with real world. ..
- CO 3. Various Machine Learning Techniques **and** its usage

- CO 4. Decision Tree Learning techniques,.
- CO 5. Artificial Neural Networks with respect to Geospatial fields.

42

DISSERTATION PHASE-1

COURSE OUTCOMES:

- CO1: Students will be exposed to self-learning various topics.
- CO2: Students will learn to survey the literature such as books, national/international refereed journals and contact resource persons for the selected topic of research.
- CO3: Students will learn to write technical reports.
- CO4: Students will develop oral and written communication skills to present and defend their work in front of technically qualified audience.

43

DISSERTATION PHASE- II

COURSE OUTCOMES:

- CO1: Students will be able to use different experimental techniques.
- CO2: Students will be able to use different software/ computational/analytical tools.
- CO3: Students will be able to design and develop an experimental set up/ equipment/test rig.
- CO4: Students will be able to conduct tests on existing set ups/equipments and draw logical conclusions from the results after analyzing them.
- CO5: Students will be able to either work in a research environment or in an industrial environment.
- CO6: Students will be conversant with technical report writing.
- CO7: Students will be able to present and convince their topic of study to the engineering community.