ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

UNIVERSITY OF MYSORE

(Estd.1916)

DIPLOMA
in
GEOGRAPHICAL INFORMATION SCIENCE

Annexure II:

CHOICE BASED CREDIT SCHEME (CBCS)
CENTRE FOR GEOINFORMATICS TECHNOLOGY

DOS in Geography, Manasagangothri, University of Mysore, Mysuru – 570006

Diploma in Geographical Information Science (DGIS)

(Only during the Even Semester)

For the students admitted to the academic year 2019-2020

ONE TERM COURSE

DGIS-PAPER-I: FUNDAMENTALS OF GIS

Objective: *The concepts of GIS, components of GIS and application areas of GIS are comprehensively understood. Students will go beyond the conventional fundamentals in GIS and GPS and move forward into modelling and applications, including specialized GPS surveys for planning studies.*

Introduction: Concepts, history, components and applications of GIS; Coordinate Systems – Basics, GCS and PCS; Spatial and Non-Spatial data; Data capturing methods; Data Query map scale and thematic maps.

Data Models and Management: Raster and Vector data formats; Spatial Data Models – Vector and Raster data models, Non- Spatial Data Models, Topology models, TIN model, Network model and applications.

GIS Modelling and analysis: Basic elements of GIS modelling; Model coupling; Spatial interpolation and types; Vector and raster data analysis; terrain mapping and analysis.

GPS: definition, history, components; types, working principles and application of GPS; GPS System Segments; advantages and disadvantages; GPS applications.

References:

1. **An Introduction to Geographical Information Systems** - Ian Heywood
2. **Geographic Information Systems: A Management Perspective** - Aronoff, S.
3. **GIS - Fundamentals, Applications and Implementations** - Elangovan, K.
4. **Introduction to Geographical Information Systems** - Chang, Kang-Tsung
5. **Remote Sensing and GIS** - Bhatta, B.
6. **Geographical Information Systems** - Maguire, David J.
7. **Mathematical Modeling in Geographical Information System, Global Positioning System and Digital Cartography** - Sharma, H.S.

CHAIRMAN
Department of Geography
University of Mysore
Mysuru-570006

DGIS-PAPER-II: GEOSPATIAL DATA MANAGEMENT (PRACTICAL)

Objective: *This is a practical course offering theme based, problem solving techniques of GIS methodology from data creation to advanced GIS and GPS analysis for student's analytical skill development.*

Data capture and Management: Data collection, Data Storing, Generation of Spatial Data, Manipulation of Non-Spatial Data, Data integration; Data Cleaning; Data Processing; Information Visualisation; Thematic maps;

Spatial Analysis Modeling: Vector data analysis; Overlay and Proximity analysis; Spatial Interpolation and Extrapolation; Thiessen Polygons; Network analysis – shortest path, service area, closest facility, location and allocation; Hydrological Modelling and other case studies.

Spatial Statistics: Mapping of central feature, distribution, mean of spatial data; Hotspot and Coldspot analysis; Goodness of Fit and other case studies.

GPS: Collection of Ground Control Points (GCP), Way Points, tracks, sight and go; routing-rerouting; Navigational aspects; Trekking and Trailing; Mobile based survey using Open data kit;

References:

1. **An Introduction to Geographical Information Systems** - Ian Heywood
2. **Introduction to Geographical Information Systems** - Chang, Kang-Tsung
3. **Remote Sensing and GIS** - Bhatta, B.
4. **Mathematical Modeling in Geographical Information System, Global Positioning System and Digital Cartography** - Sharma, H.S.
5. **An Introduction to Geographical Information Systems** – Ian Heywood
6. **Geographic Information Systems and Cartographic Modelling** - Tomlin, C.D.
7. **Geographic Information Systems and Science** - Paul A. Longley, et. al.
8. **Geographic Information Systems and Environmental Modeling** - Clarke, C., K.

DGIS-PAPER-III: APPLICATIONS OF GIS

Power and Other Networks: Power – site suitability assessment for power plants; wind power, and impact assessment, GIS in Electricity; Tourism and Telecommunication; Transportation – vehicle routing and scheduling, vehicle tracking system.

Urban Planning and Governance: LU/LC mapping, urban design, urban site selection for urban development and civic amenities; Demographic mapping; Crime Mapping; mapping administrative boundaries, city base map generation, Municipal GIS and tax management.

Water Resource: Water quality index mapping, point source pollution mapping, non-point source pollution modelling; reservoir sedimentation mapping; ground water level, potential zones, vulnerability, contamination studies.

Other applications: PPGIS, Internet of Things, Crowd sourcing, WebGIS, Disaster Risk Mapping, GIS in Energy Studies; Forest Management; Health GIS; Defence Applications; Regional planning;

References:

1. **Action Planning for Cities: A Guide to Community Practice** - Hamdi, Nabeel
2. **Application of GIS in Hydrology and Water Resources Management** - K.Kovar
3. **Developments In Water Science – Water Resources Systems Planning and Management** - Jain S.K and Singh V.P
4. **Environmental Science Toward a Sustainable Future** - Wright, Richard T.
5. **Geographic Information Systems in Water Resources Engineering** - Lynn E.Johnson
6. **GIS for Sustainable Development,** Michele Campagna
7. **Sustainability and Cities. Overcoming Automobile Dependence** - Newman, P. and Jeffrey
8. **Urban Remote Sensing** - QihaoWeng, Dale A. Quattrochi
9. **Water, Waste water and Storm Water Systems** - U.M. Shamsi

DGIS-PAPER-IV: GIS CAPSTONE PROJECT

Project work: This is a Capstone Project of during the term of study; the candidate has to choose the research topics as per the study interest. The project is should be within the scope of Geoinformatics domain, the candidate has to outline the research problems, hypothesis, and current gap in research, scope and aim of the study.

After the research work, candidate has to submit the report and it should contain diagrams and tables (Max: 40 pages) and text (Max: 50 pages). Seminars are a part of Project work in which seminars have specific purposes. Students make power point presentations on their chosen theme of research for project work, outlining the background, rationale and objectives of research, on their chosen Methodology and the rationale behind them and on their Draft Final report at the end of the semester under the guidance and supervision of their tutors/advisors/guides.