Khandesh College Education Society's

Moolji Jaitha College, Jalgaon

An "Autonomous College" Affiliated to

KBC North Maharashtra University, Jalgaon

KNOWLEDGE IS POWER

ESTD. 1945

SYLLABUS

CERTIFICATE COURSE IN GEOINFORMATICS

(Coordinated by Department of Geography)

[w. e. f. Academic Year: 2019-20]

MOOLJI JAITHA COLLEGE JALGAON • AUTONOMOUS • NAAC GRADE 'A' CGPA 3.15 (3rd CYCLE)

HEAD
P.G. & Research
Dept. of Geography
M.J. College, Jalgaon (Autonomous)

Moolji Jaitha College, Jalgaon (Autonomous)

Title of Certificate Course - Certificate Course in Geoinformatics

Aim /Objectives of the Course -

- To introduce interdisciplinary concept of knowledge and research to the students.
- To provide education and training in Geo-informatics and it's applications in micro to macro level planning.
- To address real world management problems in areas like Environment, Agriculture, Forestry, Geology, Watershed and Urban Planning using latest technology like Geo-informatics.
- To promote the use of spatial data technologies using geo-informatics tools to solve different problems.

Duration of course - 1 year

Fees structure - Rs. 2500 /-

Course structure - 1) Paper – I Credit 06 – 100 Marks
2) Paper – II Credit 06 – 100 Marks
3) Practical Course Credit 08 – 100 Marks
(Project Report and viva voce)

Eligibility for Admission - H.S.C. Passed with Basic Knowledge of Computer

Skeleton of Course -

Sr. No.	Paper	Name of the Subject	Theory/ Practical	Teac-hing Hours	Maximum marks alloted Passing			Passing			Credit
					Exter-nal	Inter-nal	Total	Exter-nal	Inter-nal	Total	
1	Paper I	Geoinformatics	Theory	90	60	40	100	24	16	40	6
2	Paper II	Introduction to Autodesk Map	Theory	90	60	40	100	24	16	40	6
3	Paper III	Introduction to Arc-GIS Desktop and GPS Project based on Application on AutoDesk Map, Arc-GIS Desktop and GPS	Practical	120	60	40	100	24	16	40	8

***Internal marks are dividing in 3 parts e.g. 05 marks for attendance, 10 marks for home assignments tutorial and 25 marks for internal test.**

Minimum Staff - Two

Mode of Examination - Annual examination system

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DETAIL SYLLABUS
Theory paper – I: Geoinformatics

Credit Points 06

A) Remote Sensing (RS)

Unit No	Unit	Sub Topic
1	**Introduction**	Introduction, Definition, Element of RS, Types of RS, Need of RS, History of RS
2	**Fundamental of Remote Sensing**	Electromagnetic Radiation, Laws of Radiation, Concept of Black body, & Spectral signature
3	**Interaction of EMR**	EMR interaction with Atmosphere: Scattering, Absorption, Refraction, Atmospheric window EMR interaction with Earth surface
4	**Types of Platforms**	Orbit, swath & types of platform 1) Ground Observation Platform, 2) Air Borne Platform, 3) Space Borne Platform.
5	**Image Resolution and Interpretation**	Digital Image, Introduction and Types of Resolution - Spatial, Spectral, Radiometric and Temporal, Elements of Satellite Image Interpretation
6	**Aerial Photography**	Introduction, Basic of Aerial Photography, Projection, Flight Planning, Stereoscopic Overlaps, Types of Aerial Photographs.

B) Geographic Information Systems (GIS)

Unit No	Unit	Sub Topic
1	**Introduction**	Introduction to Map, Basics of GIS and Definition, Components of GIS, Potential of GIS, Objectives of GIS, GIS tasks, Open source GIS softwares.
2	**Database & Data Models**	Spatial & Non-spatial Database Source of spatial and non spatial data 1) Spatial Data Models- a) Raster Data Model b)Vector Data Model, Comparison of Raster and Vector Models. 2) Non-spatial Data Model.
3	**Digitization of Data**	Introduction, Definition, Types of Digitization- Manual, semi - automatic & automatic
4	**Geospatial Analysis and Query**	Introduction, Geospatial data analysis, Attribute Query and spatial Query, Overlay operations, Network Analysis, Geo-visualization.

C) Application of Remote Sensing and Geographic Information Systems

1	Watershed, Forestry, Urban Planning, Oceanography, Geology, Agriculture. Etc.

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Theory paper – II: Introduction to Autodesk Map

Credit Points 06

▪ Introduction to Autodesk Map
▪ Autodesk map tools and commands
▪ Inserting Raster image
▪ Scale to Raster image
▪ Preparation of Layers
▪ Digitization (Point, Line, Polygon)
▪ Drawing cleanup
▪ Topology building on the basis of Point, Network, Polygon
▪ Data Attachment to topology
▪ Export as a shape file
▪ Map plotting

Paper – III: Introduction to ArcGIS Desktop and GPS

Project based on Application on Autodesk Map, ArcGIS Desktop and GPS

Credit Points 8

Practicals

A. ArcGIS
▪ Introduction to ArcMap, ArcCatalog, ArcToolbox
▪ Introduction to ArcMap Tools (Zoom in, Zoom Out, Zoom to Extend, Pan, distance etc.)
▪ Add the files and symbolization
▪ Georeferencing of the raster image
▪ Projection
▪ Clip the Image
▪ Mosaic the Images
▪ Digitization
▪ Attribute Attachment Editing
▪ Preparation of Thematic layers
▪ Preparation of the Layout and export the map
▪ Triangulated Irregular Network (TIN), Digital Elevation Model (DEM) and Digital Terrain Model (DTM)

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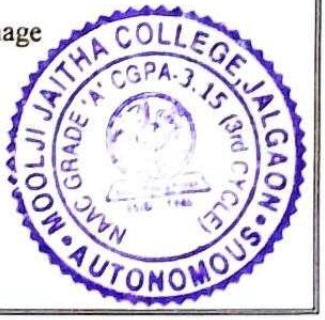
B. Global Positioning System (GPS)
▪ Introduction to Global Positioning System
▪ How to handle the GPS and mapping using GPS
▪ Application of Global Positioning System
C. Project Work
▪ Student should prepare a project report using Autodesk Map, Arc-GIS and GPS
▪ Student or group of students should submit project report at final practical Examination in 2 hard copies of the set.

REFERENCES:

- Autodesk Map getting stated manual
- Basudeb Bhatta, Remote Sensing and GIS
- Bhatta, Remote sensing and GIS by Oxford University Press, 2008
- Bob Booth and Andy Mitchell, Getting started with ArcGIS by ESRI.
- C. P. Lo and Albert K.W. Yeung (2002): "Concepts and techniques of Geographical Information System", Prentice Hall, India.
- Campbell J. B., Introduction to Remote Sensing, 5th edition, Taylor & Francis, London (2002)
- George Joseph: Fundamentals of Remote Sensing, 2004, University Press Pvt. Ltd. Hyderabad
- Jatin Pandey and Darshana Pathak, TERI, Geographic Information Systemby
- Kang-Tsung Chang, Introduction to Geographic Information Systems by, McGraw-Hill Higher Education.
- M. Anji Reddy, Textbook of Remote Sensing and Geographical Information Systems, 3rd Edition, BS publication
- Michael N. DeMers, Wiley, GIS for dummies
- N. K. Agrawa, l Essentials of GPS:, Spatial Networks Pvt. Ltd., 2004.
- P.A. Burrough and R.A. McDonnell (2000): "Principles of Geography Information System", Oxford University Press.
- Shiv. N. Pandey, Application of aerial photo interpretation in Geology
- Thomas Lillesand, Ralph W. Kiefer, Jonathan Chipman, Remote Sensing and Image Interpretation. John Wiley and Sons, New York.



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