Academic Council
Item No: _____

Devrukh Shikshan Prasarak Mandal's

NYA. TATYASAHEB ATHALYE ARTS, VED. S.R. SAPRE COMMERCE &

VID. DADASAHEB PITRE SCIENCE COLLEGE, DEVRUKH

[AN AUTONOMOUS COLLEGE AFFILIATED TO UNIVERSITY OF MUMBAI]

Syllabus for First Year of M.A./ M. Sc.

Program: M.A./ M. Sc.

Course: Geography　　　　　　**Course Code: PAGEO22**

Semester II

Geography Paper - II: Geo-informatics

Credit Based Semester and Grading System with the Effect from

Academic Year 2019-20

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<table>
<tr><td colspan="8">M.A./ M. Sc. General (Semester Pattern)
First Year M.A./ M. Sc.
Semester-II</td></tr>
</table>

Paper Code	Paper	Lectures /Practical	Evaluation Weightage			Credits
			External	**Internal**	**Total**	
PAGEO21	Geography Paper-I Oceanography and Hydrology	60 Contact + 60 Notional	70	30	100	04
PAGEO22	**Geography Paper-II Geoinformatics**	**60 Contact + 60 Notional**	**70**	**30**	**100**	**04**
PAGEO23	Geography Paper-III Socio-cultural and Political Geography	60 Contact + 60 Notional	70	30	100	04
PAGEO24	Geography Paper-IV Urban Geography	60 Contact + 60 Notional	70	30	100	04
PAGEO25	Practical components based on 21 and 22: Practical Paper-I Tools and Techniques of Spatial Analysis - III	60 Contact + 60 Notional	100			04
PAGEO26	Practical components based on 23 and 24: Practical Paper-II Tools and Techniques of Spatial Analysis - IV	60 Contact + 60 Notional	100			04

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Syllabus for First Year M.A./ M. Sc. Programme in the subject of Geography

(With effect from the academic year 2019-2020)

Semester-II, Geography Paper-II: Geo-informatics

Teaching Hours **60** + Notional Hours **60**= Total hours **120**

COURSE CODE: PAGEO22   **Credits - 04**

Learning Objectives
➢ The course provides an overview of the Geoinformatics, Remote Sensing, GIS and GNSS.
➢ It aims to shed light on the fundamentals, components, applications of remote sensing, GIS and GNSS.
➢ The course shall further focus on practical applications through paper No. V.

Topic No.	Content	Credits	No. of Lectures
	COURSE CONTENT		
1	**INTRODUCTION TO GEOINFORMATICS** o Fundamentals of Remote Sensing: Definition and Concept, Process of Remote Sensing, Development of remote sensing – Global and Indian o Electromagnetic Spectrum: Definition and Concept, interactions with atmosphere and earth's surface, Atmospheric window, Black body o Spectral Reflectance Curve: Concept, curves for land, water bodies/oceans, vegetation In Optical, IR, Thermal and Microwave bands o Fundamentals of aerial photography: Concept of stereoscopy and photogrammetry, geometric types of aerial photographs, photographic scale, measurements of distance, area, and height, relief displacement, stereoscopic parallax, flight planning.	01	15
2	**FUNDAMENTALS OF REMOTE SENSING** o Platforms and Orbits: types of platforms, types of orbits o Sensing of electromagnetic energy: Measurement of radiance, conversion of radiance to the digital number o Resolutions and Sensors: Types of resolutions, Remote Sensors and types based on resolutions and sources of illumination, an overview of space-borne sensors. o Visual Image Interpretation: Image display and color composites, elements of visual image interpretation	01	15
3	**FUNDAMENTALS OF GIS** o Fundamentals of Databases: Data storage, basic file structures, types of database, advantages of the database, spatial and non-spatial databases, scales of measurement,	01	15

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	Entity-Relationship Model, SQL, ○ Geographic Information System: Definition, concept, components, functions, and applications. ○ Spatial Data Models: Vector and Raster, Vector representation (point, line, area, and TIN), Concepts of arc, node, vertices, and topology. ○ Coordinate Reference Systems: Geographic and Projected, Map Projections and Datum for GIS data.		
4	**DATA MODELS IN GIS AND FUNDAMENTALS OF THE GNSS** ○ Vector-based spatial analysis: single layer operations (extraction and proximity) and multilayer operations (overlay operations), ○ Raster-based spatial analysis: Georeferencing, Spatial Interpolation and raster generation, raster reclassification, arithmetic, relational and logical operations ○ Global Positioning System: Segments of satellite-based positioning systems, main systems – NAVSTAR, GLONASS, Galileo, and Indian GPS ○ Principles of positioning: Positional Accuracies, Relative Positioning, errors and sources	01	15
	Total	04	60

Learning Outcomes

On completion of the course the student should have the following learning outcomes defined in terms of knowledge, skills and general competence:

Knowledge

The student can explain the definitions, nature, and scope of Geoinformatics, basics of remote sensing, GIS and GNSS, Components and applications of the Remote Sensing, GIS and GNSS, various data models in GIS, etc.

Skills

The student can analyze all the geographical/spatial phenomena using the Geoinformatics.

General competence

The student can use geospatial technology to tackle the day to day problems.

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Required Previous Knowledge

The basic knowledge of Energy Transfer is required.

Access to the Course

The course is compulsory and it is available for all the students admitting for a Master of Arts.

Forms of Assessment

The assessment will be external as well as internal. **The pattern of external and internal assessment will be 70:30**. The question paper pattern will be as given below.

External evaluation (70 Marks)
Question Paper Pattern
Time: 2.5 hours

Question No.	Unit/s	Question Pattern	Marks
Q.1	All	Fill in the Blanks	14
Q.2	All	Explain Any four concepts from the following (Out of six) (Knowledge-Based Question)	20
Q.3	All	Attempt Any two questions from the following (Out of four) (Skill-Based Question)	20
Q.4	All	Attempt any one question from the following (Out of four) (Long Answer Question based on General Competence)	16
		Total	**70**

Internal evaluation (30 Marks)

Sr. No.	Description	Marks
1	Test (Preferably Online Test with Fifteen Minutes Duration- MCQ, Match the following, True or False, etc.)	10
2	Project Report/ Seminar/ Group Discussion/ Any other assignment as allocated by the teacher	10
3	Overall Conductance	10
	Total	**30**

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail

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Reference Books:

1. Agrawal, N.K.(2006), Essentials of GPS (Second Edition), Book Selection Centre, Hyderabad

2. American Society of Photogrammetry (1983): Manual of Remote Sensing, ASP Palis Church, V.A.

3. Barrett, E.G. and Curtis, L.F. (1992): Fundamentals of Remote Sensing in Air Photo-interpretation, McMillan, New York. 7.

4. Bernhardsen, Tor (2002): Geographical Information Systems: An Introduction, Third Edition, John Wiley & Sons, Inc., New York.

5. Burrough, Peter A, and McDonnell, R.A. (1998): Principles of Geographical Information Systems, Oxford University Press, Mumbai.

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14. Parker, R, N. (2008), GIS and Spatial Analysis for the Social Sciences, Routledge, New York.

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16. Pickles, John (2006), The Social Implications of Geographic Information Systems, Rawat Publications, Jaipur.

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18. Shekar, S, and Chawla, S, (2009), Spatial Databases: A Tour, Pearson Education, Delhi.

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