# BHARATI VIDYAPEETH
# (DEEMED TO BE UNIVERSITY)
# INSTITUTE OF ENVIRONMENT EDUCATION AND RESEARCH, PUNE

Faculty of Interdisciplinary Studies

## Course Outcomes

## M.Sc. ( Geoinformatics )

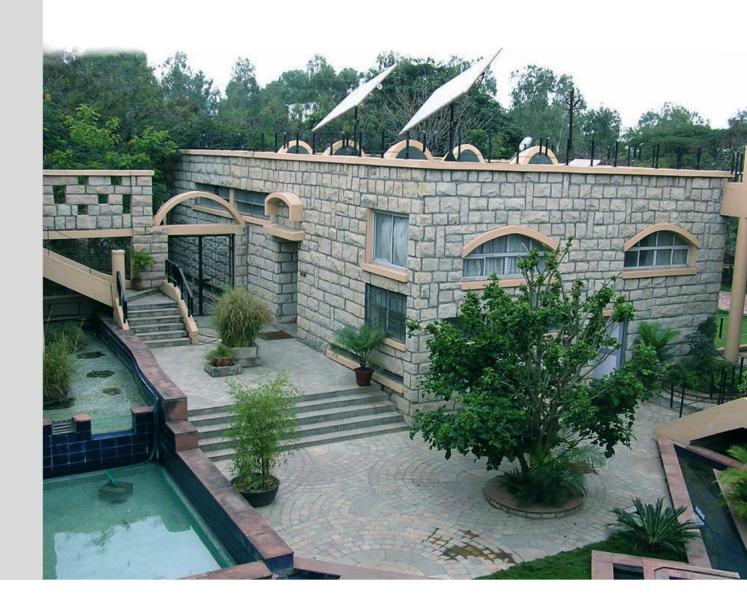effective from 2019-20

# BHARATI VIDYAPEETH (DEEMED TO BE) UNIVERSITY, PUNE

## Course Outcomes

## MASTER OF SCIENCE

## M.Sc. in GEOINFORMATICS

**(UNDER CHOICE BASED CREDIT SYSTEM)**

**Effective from the Academic Year 2019-2020**

Under

## FACULTY OF INTERDISCIPLINARY STUDIES

The Bharati Vidyapeeth (Deemed to be) University is a multidisciplnary, multicampus University having 32 institutions imparting quality education in varius disciplines. All programs of the Univeristy are approved by the University Grants Commission (UGC) and the respective statutory councils. The University has been re accredited for the thrird time with an 'A+' grade by the National Assessment and Accreditation Council (NAAC) in 2017. The UGC has accorded the 12B status (UGC Act 1956) to the University. The Ministry of  Human Resource Development, Government of India has awarded  'A' category to the University in 2012 based on several parameters that include innovative programs, research and infrastructure facilities. The University has mainained its rank in the top hundred universities of India consistenly since 2012 and is presently  ranked at 63$^{rd}$ position by the National Institution Ranking Framework (NIRF) by the UGC for the year 2020.

The University is a member of the Association of Indian Universities (AIU) and alos the International Association of Universities.

The Institute of Environment Education and Research of the Bharati Vidyapeeth (Deemed to be) University, is a constituent unit of the Uiversity established in 1993. The Institute is approved by the UGC to conduct post graduate courses in Environment Science, Geoinformatics and Wildlife Conservation Action as well as Docotral programs in Environment Science and Geoinformatics. The Institute has excellent infrastructre and competent faculty who are nationally and internationally known.  Through its collaborations with several international universities the Institute offers international student and faculty exchange programs as well as international internships.

# BHARATI VIDYAPEETH (DEEMED TO BE) UNIVERSITY, PUNE

# Faculty Of Interdisciplinary Studies

## Course Outcomes of
## Master of Geoinformatics (Under Credit System)
## Effective from 2019-2020

**INTRODUCTION**

Geoinformatics is the technology for decision support for management of resources and facilities. Due to the highly spatial nature of data handled by a GI system, it is able to provide outputs to facilitate visualization of choices made thus enabling quick and accurate decision making. Geoinformatics is an extended branch of information technology and involves the use of remote sensing, digital image processing, GPS technology, programming, etc. to build a geospatial database that can be queried to get the relevant answers. Geoinformatics combines geospatial analysis and modeling, development of geospatial databases, information systems design. Geoinformatics uses geocomputation and geovisualization for analyzing geoinformation. Many fields benefit from geoinformatics, including urban planning, land use management, in-car navigation systems, environmental modeling and analysis, military, transport network, planning and management, agriculture, meteorology and climate change, oceanography, business location planning, telecommunications, crime simulation, aviation and maritime transport.

The importance of the spatial dimension in assessing, monitoring and modeling various issues and problems related to sustainable management of natural resources is recognized all over the world. Geoinformatics becomes very important technology to decision-makers across a wide range of disciplines, industries, commercial sector, environmental agencies, local and national government, research, and academia, national survey and mapping organizations, International organizations, emergency services, public health and epidemiology, crime mapping, transportation and infrastructure, information technology industries, tourist industry, utility companies, market analysis and e-commerce, mineral exploration, etc.

Many government and non-government agencies have started to use spatial data for managing their day to day activities.

**OUTCOMES**

At the end of the course, each student will have acquired the following attributes;

1. **Disciplinary Knowledge and Interdisciplinarity**

   Demonstrate disciplinary knowledge from geospatial, data sciences, programming fields and their application in solving problems in the ecological, social and economic fields; Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes and the role of geospatial technologies in these issues; Demonstrate appropriate and advanced technical skills in investigating, analyzing and synthesizing information, problems, concepts and theories in various domains.

2. **Quantitative Competence**

   Understand essential mathematical and statistical approaches used to analyse spatial data; design database management systems and data collection protocols; Accurately comprehend and draw appropriate inferences from numeric data, statistical analysis and predictive models; Use state-of-the-art software, hardware and analytical techniques to solve a given problem.

3. **Critical Thinking**

   Demonstrate the capability to apply analytic thought to a body of knowledge; analyze and evaluate evidence, arguments, claims and beliefs on the basis of empirical evidence; formulate coherent arguments; critically evaluate practices, policies and theories following the scientific approach to knowledge development.

4. **Problem Solving**

   Identify problems, evaluate problem solving strategies and develop science based solutions using spatial data; understand the role of spatial data in  problem solving; Use acquired knowledge, skills and ingenuity to solve complex problems.

5. **Communication**

   Clearly communicate complex analyses, interpretations and significance effectively in writing and orally to varied audiences ranging from scientific to policy and the general public; be proficient in contemporary communication tools

6. **Multicultural competence**

   Possess knowledge of the values and beliefs of multiple cultures and a global perspective; capability to effectively engage in a multicultural society and interact respectfully with diverse groups.

7. **Moral and ethical awareness/reasoning**

   Identify ethical issues related to one's work; formulate a position/argument about an ethical issue from multiple perspectives and use ethical practices in their life and career; avoid unethical behavior; adopting objective, unbiased and truthful actions in all aspects

of work.

8. **Collaboration and Team work**

   Collaborate in teams with peers and mentors and work with others in diverse group settings, developing flexibility and leadership skills

9. **Lifelong learning**

   Ability to acquire knowledge and skills, including 'learning how to learn' for meeting changing demands of work place

**SCOPE**

A career in geoinformatics will have a tremendous positive impact on the world. Geoinformatics can be applied in every imaginable discipline and highly paid opportunities exist in several sectors. Career opportunities lie in the field of land resource management, integrated emergency management, water management, disaster management, risk assessment, transportation, urban planning, environment, hydrology, forestry, agriculture, military, mining, business, health, defence, space research, geology and several related fields.

India entered the space age in 1972 with the establishment of the Department of Space and is among the top ten countries of the world in this field. In India we have Space Application Centre at Ahmedabad, the National Remote Sensing Agency in Hyderabad that are the hotbed of geoinformatics research. Besides this, every state has a Regional Remote Sensing Centre. Post graduate holders in Geoinformatics can apply for the post of Jr. Scientist, Scientist, Project Coordinator, Project Scientist, Scientific /Technical Assistant, GIS Programmer, Research Scholar, etc. Besides these the rapidly growing GIS industry with ESRI, Rolta, Intergraph, Wipro, TCS, Infosys, TomTom, Genesys and others recruit regularly where post graduates can start work as Project Manager, Sr. System Executive, System Analyst, GIS Engineer, Image Analyst, GIS Programmer etc.

Jobs also exist in allied institutes working in the field of environment, biodiversity conservation, forestry, landscape studies, water management, health, etc. where geoinformatics is an indispensable tool. There is also a huge demand for geo professionals from countries like Malaysia, Australia, Canada, France, Germany, Netherlands, China, etc. This field has tremendous scope for entrepreneurship and with bank loans being easily available, for the enterprising individual the sky is the limit.

**ELIGIBILITY FOR ADMISSION TO THE COURSE**

a. The candidate should have obtained the Bachelors degree in any Science subject such as Botany, Zoology, Chemistry, Physics, Statistics, Geography, Geology, Geography, Life Sciences, Environment Sciences, Microbiology, Biotechnology, Fisheries, Marine Biology, Horticulture, Agriculture, Computer Science, Data Science, Veterinary Science, Health Sciences or

b. any branch of Engineering

c. any relevant Social Science subjects and Management Studies

d. The candidate should have secured at least 50% in the aggregate at undergraduate level and 45% for SC /ST / OBC candidates.

**DURATION OF THE COURSE**

The duration of this course is two years consisting of four semesters. The medium of instructions and examination will be only English.