Thank you for downloading this document. This is part of the series ‘Unusual Careers”. Lesser known careers are being researched and compiled by Mrs. Shobha Mathur. They are graciously being hosted on Karmayog.org and can be downloaded from http://karmayog.org/careercounselling/. This document provides valid links to various courses. All the links are working and secure as on August 2011. For any amendment, comment, suggestion, criticism or praise, please contact me on shobham@yahoo.com.
Navigate The Document Easily

You can open the Book mark panel to navigate to the topics directly. For Adobe and Foxit Reader, follow the instructions.
Preface

Basic Cartography is part of general Geography courses both at undergraduate and post graduate level, as almost all Universities offer this course; I have not listed them here.

All geography graduates can opt for advanced cartography courses.

Cartography is getting digitized today. Along with map software, Geographical Information System, Remote sensing etc are the new tools.

I have tried to give a brief description of these so you can have a better understanding of concepts.

We have to remember that these are very wide ranging applications and are not used only for cartography.

Many universities and Institutes are now offering courses in these disciplines.

I have not mentioned these courses here as the document was getting real bulky. They will be covered in another document.

Here I have concentrated on core cartography courses for Masters Degree / Diploma and some short courses which are directly related to it.

There is one document that has listed undergraduate courses internationally. That is a mine of information.

I hope this will be of help to all aspirants.
Cartography

Introduction

**Cartography** (from Greek *chartis* = map and *graphein* = write) means writing of charts or maps. Maps are the basic tools of geography.

We all use map while traveling and looking for places. Railways, Airlines, Metro, even bus companies use their own map, but what is a map exactly?

A map is like a picture, of a whole or part of an area. It shows places on a flat surface; it shows both direction and distance. Looking on the map of India you can see that Mumbai is in west, Kolkata in the east and even know the distance.

A map is a graphic interpretation of data, but is not a photograph. It can show many things that a picture cannot show, and looks different in many ways from a photograph of the Earth's surface.

There are many different types of maps that show specific things. Maps can display political boundaries, population, physical features, natural resources, roads, climates, elevation (topography), and economic activities.

Maps are produced by cartographers. Cartography means both the study of maps and the process of map-making.

It has evolved from basic general drawings, to elaborate surveys and manual measurements to the use of computers and other technologies to assist in making and mass producing maps.

**Geoinformatics, geomatics and spatial surveys are related fields.**
**Geoinformatics**

It is the science and technology dealing with the structure and character of spatial information. It is a complete system of capture, classification and qualification, storage, processing, portrayal and dissemination of all geographical data.

Geomatics is a similarly used term which encompasses geoinformatics, but focuses more on surveying.

Geoinformatics has at its core the technologies supporting the processes of acquiring, analyzing and visualizing spatial data. Both geomatics and geoinformatics include and rely heavily upon the theory and practical implications of geodesy.

Geography and earth science increasingly rely on digital spatial data acquired from remotely sensed images analyzed by geographical information systems (GIS) and visualized on paper or the computer screen.

Geoinformatics combines geospatial analysis and modeling, development of geospatial databases, information systems design, human-computer interaction and both wired and wireless networking technologies. Geoinformatics uses geocomputation and geovisualization for analyzing geoinformation.
**Branches of geoinformatics include:**

<table>
<thead>
<tr>
<th>Cartography</th>
<th>Geodesy</th>
<th>Geographic Information Systems</th>
<th>Global Navigation Satellite Systems</th>
</tr>
</thead>
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<td><img src="image2.png" alt="Geodesy" /></td>
<td><img src="image3.png" alt="Geographic Information Systems" /></td>
<td><img src="image4.png" alt="Global Navigation Satellite Systems" /></td>
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<table>
<thead>
<tr>
<th>Photogrammetry</th>
<th>Remote sensing</th>
<th>Web mapping</th>
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<td><img src="image6.png" alt="Remote sensing" /></td>
<td><img src="image7.png" alt="Web mapping" /></td>
</tr>
</tbody>
</table>

**Evolution of Maps**

Maps have changed in many ways since they were first used.

**Material of maps**

The earliest maps found were made on clay tablets. Maps were produced on leather, stone, and wood.
The most common medium for producing maps on today is, of course, paper.

**Process of making maps**

The way maps are made has also changed. Originally, maps were produced using land surveying, triangulation, and observation. As technology advanced, maps were made using aerial photography, and then eventually remote sensing, which is the process used today.

Today, however, maps are produced on computers, using software such as GIS or Geographic Information Systems.

**Appearance**

The appearance of maps has evolved along with their accuracy. Maps have changed from basic expressions of locations, to works of art, extremely accurate, mathematically produced maps.

**Map Reading**

**LEGENDS**

Maps are generally precise and accurate. They use symbols to show things.

A map has a **legend** or **key** which shows the meaning of different symbols. With a north arrow (pointing in the correct direction), or a compass rose a map provides orientation.
Color

is used to depict various heights and depths. Usually Mountains are brown and water bodies are blue.

There are many different color schemes used by cartographers. The legend explains uses of colors on a map.

Distance and Scale

A scale is relationship of sizes. Distances on the map are expressed in a ratio.

For example: 1 inch = 1 mile or 1:24,000. meaning 1 inch = 24000 miles.

The fundamental tasks of traditional cartography

Editing

Set the map's agenda and select traits of the object to be mapped. Traits may be physical, such as roads or land masses, or abstract, like political boundaries.
Map projections.
Represent the terrain of the mapped object on flat media.

Generalization.
Eliminate characteristics of the mapped object that are not relevant to the map's purpose. Reduce the complexity of the characteristics that will be mapped.

Map design
Orchestrate the elements of the map to best convey its message to its audience.

History
From crude clay maps to today’s sophisticated imagery, cartography has come a long way.

<p>| 2500 BC | In Babylonia, etched into clay and displayed locations of fields, villages, rivers, and hills. |</p>
<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 BC</td>
<td>It shows Babylon, Euphrates, surrounded by circular landmass with Assyria, Armenia, Ocean and seven Islands arranged around it to form a seven-pointed star.</td>
</tr>
<tr>
<td>1100</td>
<td>World map from the Italian monk Beato di Liebana</td>
</tr>
<tr>
<td>1490</td>
<td>The “Columbus map” perhaps was drawn by Christopher Columbus before the discovery of the New World, showing the known world in his time.</td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>1700</td>
<td>It is pretty much like modern map, by German geographer and cartographer Johann Baptist Homann.</td>
</tr>
<tr>
<td>2000</td>
<td>Physical world map from the Perry-Castañeda Library Map Collection, University of Texas.</td>
</tr>
<tr>
<td>2008</td>
<td>GIS Developing Follow Me with PHP--Visualize Geodata and create map in raster image.</td>
</tr>
</tbody>
</table>
DIFFERENT TYPES OF MAPS

Maps are used extensively throughout society. There are many different types of maps.

Road maps provide information such as street names and landmarks. Some maps are used for forecasting the weather, while others are used to plot the population in an area.

The cartographic sciences are geodesy, surveying, photogrammetry, remote sensing, geographic information systems (GIS), global positioning systems (GPS) and, of course, mathematics and statistics.

In recent years, multimedia and virtual reality became part of the cartographic experience.

These are all separate, though somewhat overlapping, disciplines, and they share an intimate relationship with cartography; indeed some have their own cartographic components.
A working acquaintance with these fields is an essential part of the education of the modern cartographer.

**Geodesy**

Geodesy is a very specialized science concerned with the shape and size (the 'figure') of the earth. This is the surface at sea level-- and it plots precise framework of points along latitude and longitude. 

This is done in two ways,

- By studying the earth's gravitational field and
- By conducting very high-accuracy surveying operations.

Previously this was entirely ground-based, but today satellite observations are routine.

Geodesy plays a fundamental role in cartography, for it defines size and shape of earth and these reference points of locations on its surface are used to chart the map.

**Surveying**

Surveying is better known, for almost everyone has seen the surveyor at work on city streets with transit, level or distance meter.

There are many branches of surveying, some of them are

- Engineering surveys- carried out in connection with construction projects
- Cadastral surveys -concerned with property boundaries
- Hydrographic surveys -depicting water bodies
- Mine surveys- outlining what is underground
- Topographic surveying-- the production of maps
Relation between surveying and cartography is very close indeed, and the end-product of the surveyor's work is often a map of some sort.

Surveying, like cartography, has undergone major changes especially by Global Positioning Systems (GPS).

**Global Positioning Systems (GPS)**

A constellation of twenty-four satellites operated by the U.S. Department of Defense comprises GPS.

It enables surveyors to determine ground locations very precisely at the click of a button on a hand-held receiver under any weather condition.

GPS is revolutionizing the practice of surveying at a very fast pace. Today, a position on the earth's surface can be determined within fractions of a centimeter.

The standard piece of information provided by a GPS receiver is readout of the calculated latitude and longitude of a given position. These latitude and longitude positions obtained from a GPS can be plotted on a chart or on a map.

**Photogrammetry**

Photogrammetry means literally measurement with light and has as its principal aim the production of topographic maps from aerial photographs.

Previously topographic maps were produced only by traditional ground surveying methods. Today most of the detail --the rivers,
coastlines, roads, buildings, contours, and so on--is now derived from airphotos.

In modern photogrammetry, the movements of the tracing device, or 'floating mark,' are translated directly into digital form and the map is plotted automatically.

**Remote Sensing**

A more recent discipline, dating from the 1960s, is remote sensing.

It is the process of obtaining information about the earth's surface using sensors carried in aircraft and satellites.

This is a direct descendent of photogrammetry. All types of remote sensing involve the measurement of electromagnetic energy reflected from or radiated by the earth's surface, and photographic cameras (based on visible light) are now accompanied by other sensing devices operating at longer wavelengths.

Examples are thermal scanners in the infrared waveband and radar systems in the microwaves. The information may be in image form (like a photograph) or in digital form. Then the computer processes digital multispectral data (data obtained simultaneously in more than one waveband) to produce land cover maps of the earth's surface.

Another application is image mapping. It is incorporation of a remote sensing image, enhanced by computer processing, into the map itself.

Remote sensing, especially sensing from space, is a major source of mappable data, and plays a key role in modern cartography.
Geographical Information Systems (GIS)

Another new discipline, perhaps the most exciting of all, GIS is a computer-based system for handling geographical data, that is, data relating to the earth's surface.

The word 'handling' covers at least two different operations.

- **Normal** - data storage and retrieval,
- **Analytical operations** - like buffering, overlay, network analysis and view shed modeling,

Data are stored in the computer in the form of 'layers,' each in effect a digital map of some component of the landscape (e.g. a streams layer, a roads layer, a soils layer) and analyses are achieved by performing operations on these layers, sometimes one at a time, sometimes on several layers simultaneously.

Each stage in an analysis is displayed in map form on a high-resolution computer monitor, and the end-product is mostly itself a map.
With its range of proven applications GIS has become a billion-dollar business since the early eighties,

These include

- Forest management,
- Urban planning
- Emergency vehicle dispatch
- Mineral prospecting
- Retail outlet location
- Maintenance of public utilities
- Waging war
- Host of applications with purely scientific ends.

**Mathematics and Statistics**

Mathematics and statistics are heavily involved in the mapping process, not only because of the geometric aspects of describing locations in space, but also because of clear needs to describe and summarize the characteristics of spatial data.

**Multimedia (MM)**

Computer systems allow for integrated access to a range of data through the means of stimulation of human senses using digital technology.

This includes the integration of images, video and graphics, maps and photographs, text and sound.

This technology has a wide range of applications including education, scientific research, military activities and, of course, entertainment.
**Virtual Reality (VR)**

A computer system that can combine a mixture of real world experiences and computer generated material to allow for simulated real world representation produces a "virtual reality."

VR addresses the construction of artificial worlds with clear spatial dimensions... Cartographers have a major role to play in the identification of VR as a potential research tool.

**Geomatics**

Geomatics is an umbrella term coined in Canada for cartography and the cartographic sciences.

In cartography, technology is changing dramatically.

The first maps were manually constructed with brushes and parchment; therefore, varied in quality and were limited in distribution.

The advent of magnetic devices, such as the compass and much later, magnetic storage devices allowed for the creation of far more accurate maps and the ability to store and manipulate them digitally.

Advances in mechanical devices such as the printing press, allowed for the mass production of maps and the ability to make accurate reproductions from more accurate data.

Optical technology, such as the telescope, sextant and other devices that use telescopes, allowed for accurate surveying of land and the ability of mapmakers and navigators to find their latitude by measuring angles to the North Star at night or the sun at noon.

In the 20th century availability of computers and peripherals such as monitors, plotters, printers, scanners (remote and document) and analytic stereo plotters, along with computer programs for visualization, image processing, spatial analysis, and database
management, have democratized and greatly enhanced the making of maps. The ability to superimpose spatially located variables onto existing maps created new ways of making maps.

Today most commercial-quality maps are made by software. This is of three types:

- CAD,
- GIS
- Specialized illustration software.

Spatial information can be stored in a database, from which it can be extracted on demand. These tools lead to increasingly dynamic, interactive maps that can be manipulated digitally.

**Map types**

**General vs. thematic cartography**

The field of cartography can be divided into two general categories:

**General cartography**

General cartography makes maps for a general audience. General maps show many reference and location systems and often are produced in a series. For example, the 1:24,000 scale topographic maps of the United States Geological Survey (USGS) are a standard as compared to the 1:50,000 scale Canadian maps.

**Thematic cartography**

Thematic cartography involves maps of specific geographic themes, oriented toward specific audiences. Thematic cartography has become increasingly useful and necessary to interpret spatial, cultural and social data.
Topographic vs. topological

A topographic map is primarily concerned with the topographic description of a place, including the use of contour lines showing elevation. Terrain or relief is shown in a variety of ways.

A topological map is a very general type of map, the kind you might sketch on a napkin. It does not show scale and detail but has clarity of relational information. Beck's London Underground map is an iconic example.
Unusual Courses

The only topography on it is the River Thames, letting the reader know whether a station is north or south of the river. That and the topology of station order and interchanges between train lines are all that is left of the geographic space. Yet the map fulfils its purpose.

How to Become a Cartographer

Previously one could become a cartographer by joining a mapping agency and learning on the job, but it is not possible now. Today, cartography is so complex that you need formal training,

Training needed

- Cartographers typically need at least a bachelor degree in cartography, geography, engineering, or other related field.

- Coursework in environmental sciences, geography, mathematics, surveying, and statistics is desirable.

- They need complete training in computer assisted design (CAD), computer-assisted mapping (CAM), satellite navigation, and computer-assisted cartography (CAC).

- Cartography students also participate in fieldwork to gain hands-on experience.

- Cartographers must stay up to date on technological advances and often complete continuing education courses.
**Job prospects**

Employment of cartographers is expected to grow much faster than average for all professions, increasing 20% from 2010 to 2016. The increased demand for fast, complete, and accurate geographic information will drive job growth.

Job prospects are expected to be favorable especially for cartographers who have at least a bachelor degree and extensive technical experience.

Mostly a bachelor's degree is the basic qualification to get an entry level job. A portfolio of completed maps may also be required. After gaining experience a cartographer can become a supervisor. By acquiring additional skills and training, an individual can move into one of the specialized areas of cartography.

The best opportunities will be for those who have experience in newer technologies such as GPS (global positioning system) and GIS.

**Remunerations**

The employment of cartographers is expected to grow as fast as the average through the year 2014.

Cartographers with 1 to 4 years experience earn between $29,800 and $43,700 annually.

5 to 9 years experience earn between $48,605 and $76,302.

In UK Salaries for cartographers may start at around £12,000 a year.

With experience a cartographer may earn around £25,000.
A cartographer in a senior or management role may earn up to £35,000.

**Eligibility**

Pass 10+2 with Mathematics to join any recognized university that offers the undergraduate degree in cartography or geography or physical science and pursue the degree.

Obtain training in computer technologies like CAD, CAM and CAC and get an exposure in cartography field.

**Geography Internships**

An internship is very valuable to obtain on-the-job experience that will not only benefit your resume and provide contacts to employers, but will also help you to determine what to do after graduating.

Jobs in GIS and planning are becoming more common and geographers can easily fill these positions with experience gained in the classroom and in an internship. While some internships are paid, the vast majority are not. A good internship will allow you to be part of the day-to-day activities of your agency - you should be part of not just the work, but also the departmental planning, discussion, and implementation.
Unusual Courses    Cartography

Just be sure that if you're asking about an internship, that you have the appropriate skills for the job (for example, you should probably have some coursework in GIS prior to an internship in GIS.)

When contacting a prospective agency about an internship, be sure to have a fresh and up-to-date resume and cover letter. You'll be amazed at how much you learn from the on-the-job experience and you'll be much more employable afterwards.

**Major employers:**

- Local and central government departments
- The Armed Forces
- National mapping agencies
- Utility companies (gas, water, electricity)
- Companies that design, produce and sell GIS software (geographic information systems)
- Atlas Publishers and producers.

Entry is very competitive and it may be necessary to take up a post involving more basic activities in order to make a start in the industry.

Employers with vacancies tend to approach the universities that offer GIS, cartography or surveying-related degrees.

**Working Hours and environment**

Most cartographers work normal office hours, Monday to Friday, 9am to 5pm. Some employers may offer flexitime options.
Many work in an office, sitting at a desk with a computer. They usually work with a team of other cartographers. They may travel around the country or, occasionally, overseas when doing surveys.

Institutes

1. Undergraduate cartography courses
This is a web page giving links to international institutes for cartography. It is a mine of information.
http://lazarus.elte.hu/cet/undergraduate/n-amer.htm

2. Annamalai University
   Faculty of Science : Department of Earth Sciences
   http://annamalaiuniversity.ac.in/fact_sci_earthsciences.php
   The fees mentioned are only for 1st semester. Check for others
   http://annamalaiuniversity.ac.in/fees.php
   M.Sc. Geoinformatics (CBCS)
   M.Sc. (Environ. Science)
   Tuition Fees - First Semester : 1000
   Special Fees : 6575,
   Development Fees : 250, Computer Fees : 900, Library Fees : 500,
   Sports and Games Fees : 200, Cultural Fees : 100, Student Medical
   Relief : 500, Laboratory Fees : 500, Red Cross : 15, Group
   Insurance : 100, Total : 10640 Rs.
   http://annamalaiuniversity.ac.in/fees_viewmore.php?id=052111
3. **Central University Of Karnataka**

   **Department of Geography**

   **M.Sc. in Geospatial Applications in Regional Development**

Eligibility Criteria Bachelors degree in any discipline from a recognized Indian or foreign university (foreign recognition to be as per AIU list) with at least 50% marks aggregate and who have qualified in the entrance test conducted by the University.

**Intake 30 Students**

http://www.cuk.ac.in/dept_geo_sci.html

**Address**

Central University of Karnataka

(established by an Act of the Parliament in 2009)

II Floor, Karya Soudha,

Gulbarga University, GULBARGA-585 106

Shri. Anup K Pujari

Registrar 08472-278056
Unusual Courses

Cartography

apujari@yahoo.com
anuppujari@hotmail.com

4. Cotton College

Guwahati

The Department of Geography

M.A. & M.Sc, Specialization offered in. :
Geoinformatics/Fluvial Geomorphology/Regional
Planning/Cartography/Population Geography

http://www.cottoncollege.org.in/geography.htm

Mailing Address :
Principal,
Cotton College
Panbazar
Guwahati, Assam, India
PIN - 781 001

Phone :
+91-361-2540715 (Principal)
+91-361-2608839 (Vice-Principal)
+91-361-2510667 (Administrative Officer)
+91-361-2540715 (Fax)

Email : principalcottoncollege@rediffmail.com

5. Indian Institute of Remote Sensing (IIRS)

http://www.iirs.gov.in/
M.Sc. in Geoinformatics

http://www.iirs.gov.in/dynamic.php?action=M.Sc

Geoinformatics is a powerful tool to create maps, integrate information, visualize scenarios, solve complicated problems, present ideas, and develop effective solutions.

Geoinformatics has become an important requirement of Information Society and for civic amenities.

There is a growing need for professionals in the field of Geoinformation technology, who can prepare, maintain and update geographic databases, and develop new Geoinformatics tools.

Address

Director IIRS
Indian Institute of Remote Sensing
4, Kalidas Road,
Dehradun - 248 001 (India)

Tel: + 91 - (0)135 - 2744583
Fax: + 91 - (0)135 - 2741987 / 2748041
E-mail: director@iirs.gov.in

Programme Co-coordinator (Academics)
Indian Institute of Remote Sensing
4, Kalidas Road,
Dehradun - 248 001 (India)
Tel: + 91 - (0)135 - 2524105 , 2524106 , 2524107.
Fax: + 91 - (0)135 - 2741987 / 2748041
E-mail: pca@iirs.gov.in
6. **Indian Institute of Surveying and Mapping**  
http://soisti.ap.nic.in/

**COURSES ON GEODESY**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Course Name</th>
<th>Batch No</th>
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<th>Duration</th>
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<th>Fees (Rs)</th>
<th>Course Capacity</th>
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<tr>
<td>1</td>
<td>Control and Detail Survey by GPS and Total Station</td>
<td>19</td>
<td>690</td>
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<td>23.06.2010</td>
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<td>2</td>
<td>Map Updation using</td>
<td>05</td>
<td>585</td>
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<td>21.07.2010</td>
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<td>Surveyors by Profession</td>
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</tbody>
</table>
http://soisti.ap.nic.in/geodesy.htm

Address
FACULTY OF GEODESY
The Addl Surveyor General,
Indian Institute of Surveying & Mapping
Survey of India
Uppal, Hyderabad
A.P. INDIA. Pin- 500039.
Fax : +91-40-27200286
E-mail: iismsoi-ap@nic.in
Phone : EPABX +91-40-27201181, +91-40-27201185, +91-40-27201186.

7. Jamia Millia Islamia –

Faculty of Natural Sciences :Department of Geography

P. G. Diploma in Digital Cartography
http://jmi.ac.in/Fnat/Courses_Geog.htm

Admissions to all the courses in Jamia Millia Islamia are held annually.

Candidates seeking admission to any course are required to submit the prescribed Application Form
which may be obtained from the University on payment of the prescribed fees, or it may be downloaded from this website and submitted along with the fees as mentioned in the Prospectus.

Only original downloaded Forms should be submitted along with the prescribed fee. The candidates are required to go through an Entrance Test which is followed by an Interview and, in some specific courses, a Group Discussion is also held. The relevant information in this context is available on the following links:

Download Prospectus and Admission Forms for Admissions 2011-2012

8. Jawaharlal Nehru Technological University
http://www.jntu.ac.in/spatial-info.php
The Centre for Spatial Information Technology
http://www.jntu.ac.in/course-spit.php
Courses Offered:

- M.Tech in Spatial Information Technology (FTPG)
- M.Tech in Geo-Informatics & surveying Technology (FTPG)
- M.Tech in Remote Sensing & Geographical Information System (PTPG)
- MS in Spatial Information Technology
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\- PhD in Spatial Information Technology

**Address**

Jawaharlal Nehru Technological University Hyderabad
Kukatpally, Hyderabad - 500 085,
Andhra Pradesh, India
E-Mail: info@jntu.ac.in

**Dr. M. Chandra Shekar**
Rector 32422256 1222 23158665
pa2rector@jntuh.ac.in

**Dr. G. Tulasiram Das**
Registrar 32422253 1444 23158665
das_tulasiram@jntuh.ac.in

9. **Madurai Kamaraj University**

Madurai
School of Earth and Atmospheric Sciences
Department of Environmental Remote Sensing and Cartography

**M.Sc. Environmental Remote Sensing & Geoinformation Technology**

http://www.mkuniversity.org/earth_dept.htm

Eligibility: A pass in B.Sc. degree in any subject/B.E., Civil/Arch./Town and Country Planning with minimum of 50% in major subject.

Advertisement Month: May

Mode of Selection & Month: Entrance June
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Cartography

Address
Department of Geography
Madurai Kamaraj University
Madurai, Tamil Nadu, India
Telephone : 458 471 Ext. : 372
Fax : +91 - 452 - 459139/459105

10. Mahatma Jyoti Rao Phoole University Jaipur

PG Diploma Geographical Cartography
Faculty of science
Institute MJRP PG GIRLS COLLEGE
Eligibility B.A/B.Sc Pass Course & Hons Having Geography
M.A/M.Sc in Geography
No of seats 40
Fees 10000 Per Annum
Duration 1 Year
Security Amount 2000
http://www.mjrpuniversity.com/mjr/public/viewMjrpCourses.aspx?FacultyId=25&FacultyDesc=Science%A%27882%27

Address
Corporate Office :-
Ram Nagar Ext.,
New Sanganer Road,
Sodala, Jaipur 302019
Rajasthan, INDIA Phone No. : 91-0141-2294680, 2295101, 2295239 Fax No. : 91-0141-2294947

University Campus :-
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Cartography

SP-2,3 Kant Kalwar
RIICO Industrial Area,
NH-8 Near Achrol, Jaipur, Phone No.-01426-222950,
222951,222952
Rajasthan Email: info@mjrpuniversity.com Website:
www.mjrpuniversity.com

11. **MANGALORE UNIVERSITY**

http://www.mangaloreuniversity.ac.in/xampp/

Department of Geoinformatics

http://www.mangaloreuniversity.ac.in/xampp/departments/geoinformatics.html

**M Sc. Geoinformatics**

2 years / 4 semesters

Special Fee Rs. 26,000-00 + *General Fee Rs. 10,810-00 for *General

category

and for Partially Self financed Category Special Fee of Rs. 36,000-00 +

*General Fee Rs. 10,810-00.

For SC/ST/Category-I *General Fee of Rs. 1,840-00 (and 50% of the Special

fee prescribed for General Candidates see Details in Prospectus provided along

with Application form).

*As fixed by the government from time to time.

Foreign/NRI 3400 $ U.S per Annum. Details in Prospectus

**Address**

DR. B.R. RAGHAVAN
CO-ORDINATOR IN GEOINFORMATICS
12. **Osmania University**

http://www.osmania.ac.in/

**PG DIPLOMA IN GEOGRAPHICAL CARTOGRAPHY**

[1 -YEAR]

**Eligibility**

i) B.A. B.Sc., M.A. or M.Sc. degree of a recognized University in Geography, Geology, Economics, Statistics or Mathematics with 40% of marks in the aggregate or

ii) Five year Diploma in Architecture, Fine Arts or Commercial Arts with a minimum of 40% marks in the aggregate

or iii) Bachelor of Architecture

or iv) Graduate of any University with 40% of marks in the aggregate with at least one year experience in mapping in a Government/Quasi Government Institution.

**Address**

<table>
<thead>
<tr>
<th>VC</th>
<th>Vice Chancellor</th>
<th><a href="mailto:vc@osmania.ac.in">vc@osmania.ac.in</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrar</td>
<td>Registrar</td>
<td><a href="mailto:registrar@osmania.ac.in">registrar@osmania.ac.in</a></td>
</tr>
</tbody>
</table>
13. **School of Planning**

Ahmedabad

**M.Sc. (Geomatics & Space Applications)**

http://www.cept.ac.in/index.php?option=com_content&view=article&id=66&Itemid=127

Details: download PDFs
http://www.cept.ac.in/index.php?option=com_content&view=article&id=106&Itemid=68#Geomatics%20&%20Space%20Applications

**Address**

CEPT University
Kasturbhai Lalbhai Campus,
University Road,
Ahmedabad-380009,
Gujarat, India.
Phone - 0091-79-26302470 / 26302740   |
Fax - 0091-79-26302075

14. **University of Madras**

**Department of Geography**

**M.Sc. Spatial Information Technology**

B.A. / B.Sc.-Geography / Geology / Physics / Environmental science/ Environmental Management/ Computer Science/
computer Applications/ Information Technology as the main subject of study or Geography as one of the subjects of study with knowledge of Mathematics/ Statistics at least at the +2 level or B.E. Civil Engineering or any Information Technology related fields.

http://www.unom.ac.in/departments/geography/courses.html

Address
Enquiry - 2539 9422
PRO - 2539 9413
Tel.Exchange - 2539 9466
Contact page: http://www.unom.ac.in/contact/contact.html

International

15. The Institute for Cartography
Master of Science in CARTOGRAPHY
http://www.cartographymaster.eu/

The new International Master program (Master of Science, M.Sc.) in CARTOGRAPHY is a cooperation of:

- Technische Universität München (TUM), Department of Cartography
- Technische Universität Wien (TU Wien), Research Group Cartography
- Technische Universität Dresden (TU Dresden), Institute for Cartography
Program coordinator (TUM):
Dipl.-Ing. Stefan Peters

Department of Cartography
Technische Universität München
room 1771
Arcisstrasse 21
80333 München, Germany
Tel.: +49-(0)89-289-23959
Fax.: +49-(0)89-289-23202
email: info@cartographymaster.eu
web: carto-tum.de

Local coordinator at TU Vienna:

Univ.-Ass. DI Felix Ortag
Research Group Cartography
Department of Geoinformation and Cartography
Vienna University of Technology
Erzherzog-Johann-Platz 1/127-2
A-1040 Vienna, Austria
Tel.: +43-1-58801-12615
Fax.: +43-1-58801-912615
email: ortag@cartography.tuwien.ac.at
web: http://cartography.tuwien.ac.at

Local coordinator at TU Dresden:

Dr. rer. nat. Nikolas Prechtel
Institut für Kartographie
Technische Universität Dresden
Helmholtzstr. 10
Hülsse-Bau, Westflügel
room West 138  
Tel.: +49-(0)351-463-33278  
email: nikolas.prechtel@tu-dresden.de  
web: http://kartographie.geo.tu-dresden.de

16. **Moscow State University of Geodesy and Cartography (MIIGAiK)**  
http://www.miigaik.ru/eng/  
Our University is one the oldest institutions of higher education in the field of geodesy and cartography.  
At present, the University is a large education complex of specialists, postgraduate courses and courses for doing doctoral dissertations, training laboratories in modern fields of geodesy, cartography and remote sensing.  

**TRAINING OF FOREIGN STUDENTS**  
The University enrolls foreign citizens to study at 7 faculties in 20 majors and provides them with higher technical education, awards Bachelor`s or Master`s degrees.  
The course of training lasts for 5 years at all faculties except for the Faculty of Optical Instrument-Making where the training is provided for 6 years.  
Doing a Bachelor`s degree course takes 4 years.  
Before starting training at the University, foreigners are to study at the Preparatory Faculty for one year to learn Russian and improve their knowledge in physics and mathematics.  
To study at the basic faculties the candidates are to produce a legalized copy of their secondary education certificate (Secondary School Certificate), a health certificate, a certificate of passing a Russian Language examination, and to have an interview.
The academic year at the University is divided into two academic terms:

From September to January; and  From February to June.

Moscow State University of Geodesy and Cartography gives foreign students much opportunity to do Bachelor’s degrees and to continue their studies for two or three years more to get a Master’s degree.

Post-graduation training at the University is allowed to all foreign students having a Bachelor’s Degree Certificate issued by higher educational institutions in the relevant field of knowledge and industry.

Every foreign student is provided with comfortable accommodation. MIIGAiK provides foreign students with training at postgraduate courses taking 3 to 4 years, a PhD’s degree can be conferred on the student.

It is also possible to carry out research. The trainees have access to all necessary laboratories and equipment for their research in the domain of their choice. They are always supervised by highly qualified scientists and experts.

http://www.miigaik.ru/eng/tofs.htm

**Address:**
MIIGAiK #4 ,
Gorokhovsky pereulok 105064,
Moscow, RUSSIA

**Website:** http:// www.miigaik.ru

**Rector’s Office:**
Phone: +7 (495) 261 3152
17. **North Carolina State University**

**Computer Cartography**

Principles of cartographic design and how to apply them to produce high-quality geographic information system (GIS) based maps. Successful students will acquire an understanding of map design and experience applying it with GIS software. Students produce project maps in both print and web media.

**Level:** Graduate

**Course Id:** GIS 515

**Fall 2011 section 601**

**Section Title:** Computer Cartography

**Start Date:** 08/17/2011

**Course Reg num:** 13622

**Restrictions:** [http://distance.ncsu.edu/courses/index.html](http://distance.ncsu.edu/courses/index.html)
Unusual Courses    Cartography

Information:  http://distance.ncsu.edu/courses/index.html
Registration:  http://distance.ncsu.edu/
Billing:       http://distance.ncsu.edu/tuition/index.html
http://online.northcarolina.edu/course.php?id=13836

Short courses

http://natmo.gov.in/

INTRODUCTION
The National Atlas and Thematic Mapping Organization (formerly National Atlas of India) was set up in 1956.
The organization is engaged in preparation of maps and atlases of different themes using aerial photographs, remote sensing data, GIS, Field surveys etc.

The organization is unique of its kind in the country in the field of Thematic Cartography and Geographical research. It has imparted training to Geographers and Geologists belonging to various state central government departments, Universities, colleges and autonomous institutions.

NATMO offers the following training programs in the various fields of map-making during the calendar year 2011.

Remote Sensing and GIS (Two weeks)
Application of Aerial Photography in Thematic Mapping (Two weeks)
Cartography and Map Reproduction (Two weeks)
Cartography (Two weeks)
Digital Mapping and Geographical Information System (Four weeks)
Digital Cartography (Four weeks)
Global Positioning System (One week)

**TRAINING CENTRE**

Training courses are conducted at the NATMO HQ, Kolkata in the Premises of Research, Development and Training Division housed at the 7th floor of DF Block, Salt Lake, Kolkata 700 064
Unusual Courses

Cartography

Address
Dr.B.P. Singh
  Dy.Director & Head
Research Development & Training Division
National Atlas & Thematic Mapping Organization
CGO Complex, 7th floor, DF Block, Salt Lake,
Kolkata 700 064.
Mobile. +919883099435

Dr.A.K.Goswami
Research Officer & Course coordinator
Mobile. +919433765272
Phone: 2334-6341/6585/5349/6331/6459/5006 Ext. 348 / 347 / 350
Fax: (033) 23346460
E-Mail: natmordtd@gmail.com
Website: www.natmo.gov.in

19. Institute of Geoinformatics and remote sensing (IGRS)
http://www.igrs-gis.com/

IGRS is an independent Geographical Information Systems (GIS) and Remote Sensing training institute, based in Kolkata.
IGRS provides the full range of GIS services including feasibility studies, needs assessment analysis, system implementation, data conversion, spatial analysis, GIS database development and quality map production. We provide advice on the most cost-effective options for utilizing GIS technology.

IGRS offers short courses of two to six months in different disciplines of geographic information technologies, such as Introduction to GIS and RS, Photogrammetry, Spatial Analysis, Geostatistics, GIS Project Development, WebGIS and Geodatabases.

The basic purpose of such short term training programs is to create awareness in utilization of such advanced technologies in different fields and in the benefits of GIS/RS applications in restructuring the decision making process. IGRS also provides customized training programs to different organizations.

**Training Courses**

6 months PG Courses in GIS

- Post Graduate Certificate in GIS and RS  Fee  rs. 16854
- Post Graduate Certificate in GIS based programming :Fee  22472 rs ( all inclusive)

**Short Term Courses**
Basics of GIS/RS

<table>
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<tr>
<th>Course Code:</th>
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<td>Course Duration:</td>
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<td>Training Center:</td>
<td>Kolkata/Hyderabad</td>
</tr>
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<td>Fee 1350</td>
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</table>

Who Should Attend The Course

The course is designed for following groups of people
Executives/Teaching professional from different stream wanting to know about GIS
Graduates/Undergraduates
Software professional planning to code on GIS Platform.

Topics Covered

Fundamentals of Geographical Information System (GIS)
Basics of Geography
Hardware & Software Requirement
Fundamentals of GIS and Mapping
Data Visualization
Thematic Map Preparation
Concepts of Remote Sensing (RS)
Unusual Courses

Cartography

Basics of Remote Sensing
Electromagnetic Energy
Basics of Global Positioning System
Fundamentals of Photogrammetry

Digital cartography using ArcGIS

<table>
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<tr>
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<th>STL04 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Duration:</td>
<td>2 months (150 hours)</td>
</tr>
<tr>
<td>Training Center:</td>
<td>Kolkata/Hyderabad</td>
</tr>
</tbody>
</table>

Overview

This subject introduces the student to the techniques for creating scaled maps in ArcGIS software and preparing the presentation of the same GIS based maps in order to maximize their effectiveness and simplify their interpretation. Students will learn how to design visualizations of information, taking into account the problems of human perception, variations in audience type, and the media or presentation environment selected. They will be taught how to classify spatial and non-spatial, multi-dimensional, discrete and continuous data to elicit the most information from them.
Who Should Attend

Course specifically designed for students/fresher/teaching professional from geography, geology background

Topics Covered

Introduction to Digital Cartography
Definition and classification of maps
Types of data
Visual variables
Generalization
Symbolization
Creation of map files and importing them into geodatabase
Creation of style file for symbolization
Map design, Map Layout, Diagrams Map Projection
Topographic mapping
Production of large-scale maps and photo and image maps
Fee rs 4500

Digital cartography using MapInfo

Course Code: STL04 B
**Unusual Courses**

<table>
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<th>Course Duration:</th>
<th>2 months (150 hours)</th>
</tr>
</thead>
<tbody>
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**Who Should Attend**

Course specifically designed for students/fresher/teaching professional from geography, geology background

**Topics Covered**

- Introduction to Digital Cartography
- Definition and classification of maps
- Types of data
- Visual variables
- Generalization
Symbolization
Creation of map files
Map design, Map Layout, Diagrams Map Projection

Topographic mapping
Production of large-scale maps and photo and image maps
Fee 4500

Address
Kolkata
25/1, Rustomjee Street,
Kolkata: 700019,
India
Phone:+91 33 2440 0695
    +91 33 2460 2501
Fax:    +91 33 2460 2494

Hyderabad
Arya 1, V Floor, Plot No 13,
P.G. Road, Secunderabad-500003,
India
Phone:+91 40 4020 0962

Email: training@igrs-gis.com
Visit us: http://www.igrs-gis.com

20. Khagolam Institute of Geoinformatics
http://www.khagolam.com/default.aspx
**Instructor Led Courses**

- Introduction to GIS
- Introduction to ArcGIS 9.3
- Introduction to QGIS 1.5
- GIS for Urban Planning
- Introduction to AutoCAD Map 3D 2009
- Programming ArcObjects with .NET
- Programming .NET API for AutoCAD


**Address**

A-Wing, 2 Floor, Sudhanshu Chamber
Station Road, Kalyan (Wast),
Thane, Mumbai-421 301, Maharashtra

Email: info@khagolam.com

Phone Number: +91 251 2209910
Mobile Number: +91 9892 998947

Office Time: 11:00 AM to 8:00 PM

Training Centers    Mumbai | Hyderabad

**Software**

**1. Cartographer’s guild**

They have tutorials for digital cartography and software discussions.

2. **Digital Cartography**
http://artwiki.wikidot.com/digital-cartography

Here you can find various tutorials on creating maps digitally.

3. **Digital Cartographic Standard for Geologic Map Symbolization**

This standard is intended to provide to the Nation's producers and users of geologic-map information a single, modern standard for the digital cartographic representation of geologic features. A simple mapping and GIS shareware package.

4. **AGIS Software**

A simple mapping and GIS shareware package
http://www.agismap.com/index.html

5. **So you want to be a Cartographer?**
Love maps? Want to make your own? Now it’s easy thanks to a set of free software.

This article is in the form of a tutorial to get you quickly started creating your own maps

http://www.britishideas.com/2011/01/16/so-you-want-to-be-a-cartographer/

6. Learn2Map Free GIS Tutorial and Shapefile Atlas


In just a few minutes you can begin to learn how to create sophisticated maps. The easy-to-follow step-by-step distance learning online tutorial is based on free resources. There is nothing to purchase. All you need to begin mapping today is the Learn2Map™ Tutorial and Atlas.
Associations

1. **British Cartographic Society**
   
   http://www.cartography.org.uk/

   The BCS is a dynamic association of individuals and organizations dedicated to exploring and developing the world of maps. The BCS is regarded as one of the world's leading cartographic societies and its main publication, *The Cartographic Journal* is recognized internationally.

2. **United Nations Cartographic Section**
   
   Maps and Geographic Information Resources
   

3. **Cartography 2.0**
   
   http://cartography2.org/

   Cartography 2.0 is a free online knowledge base and e-textbook for students and professionals interested in interactive and animated maps.

4. **INCA - Indian National Cartographic Association**
   
   INCA - Indian National Cartographic Association, is a non-profit making professional body of Cartographers, established in 1979 at Hyderabad (India) with the following Aim

   Fostering cartographic Research in India Promoting academic interaction within an inter-disciplinary frame

   Co-operate with professional organizations of cognate disciplines
Create "Map Awareness" amongst the public
Secure for cartography its legitimate place in national life and to
strengthen among cartographers a sense of responsibility and
professional efficiency.

http://www.incaindia.org/

5. The Society of Cartographers
We aim to support and encourage all those involved in the
production of maps. The Society's membership is widely drawn
from the education sector, statutory institutions, local authorities,
public utilities and the commercial and publishing industry. The
majority of the membership is UK based, but with a significant
world-wide membership.

http://www.soc.org.uk/

6. Association for Geographic Information (AGI).
Now in its 22nd year, AGI is a member of the UK Location
Council, an INSPIRE Spatial Data Interest Community (SDIC) and
administers the British Standard's Committee for Geographic
Information

www.agi.org.uk