

# Cartography

## 8.11



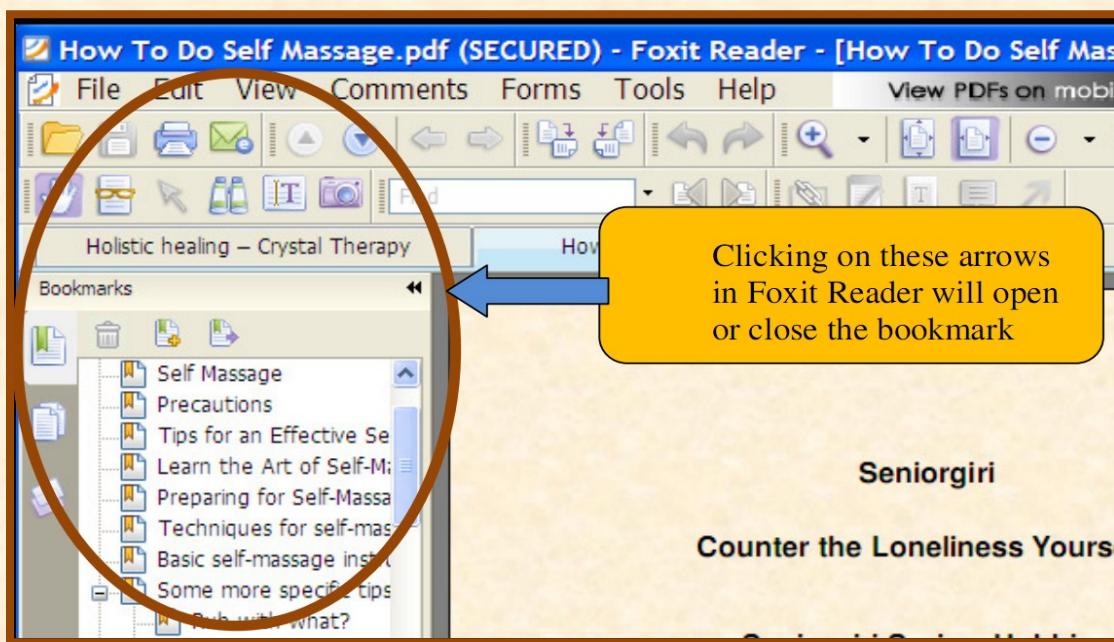
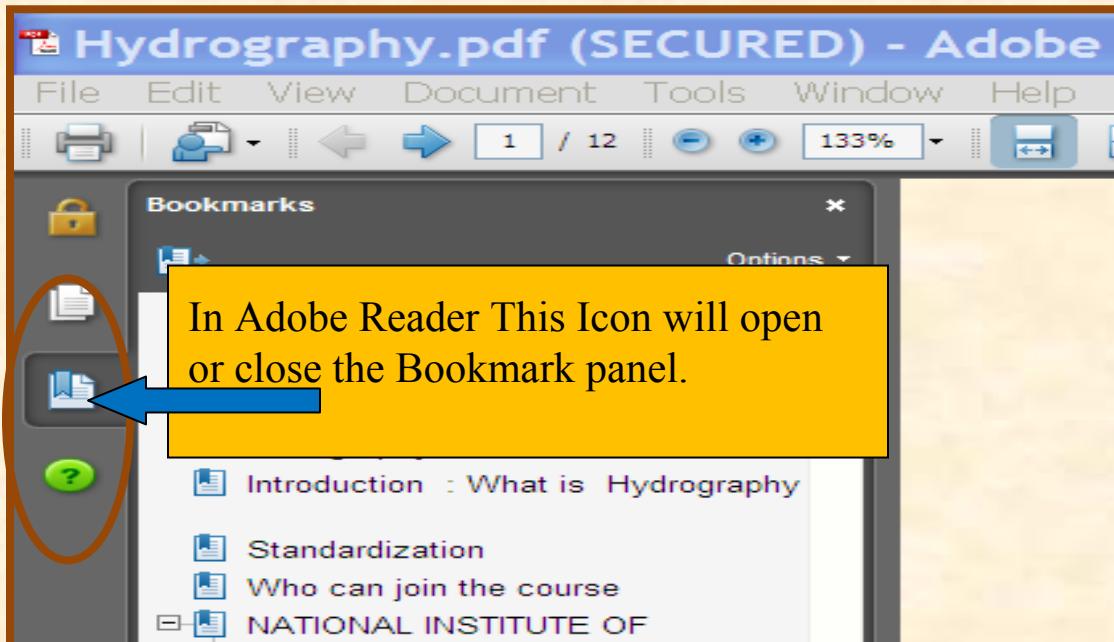
Thank you for downloading this document. This is part of the series ‘Unusual Careers’. Lesser known careers are being researched and compiled by Mrs. Shobha Mathur.

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](mailto:shobham@yahoo.com) .

Unusual  
Careers

### **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.

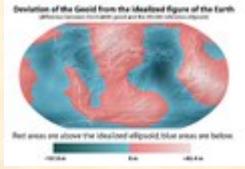
Geomatics is a similarly used term which encompasses geoinformatics, but focuses more on surveying.

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:

			
Cartography	Geodesy	Geographic Information Systems	Global Navigation Satellite Systems

		
Photogrammetry	Remote sensing	Web mapping

### 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, map 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

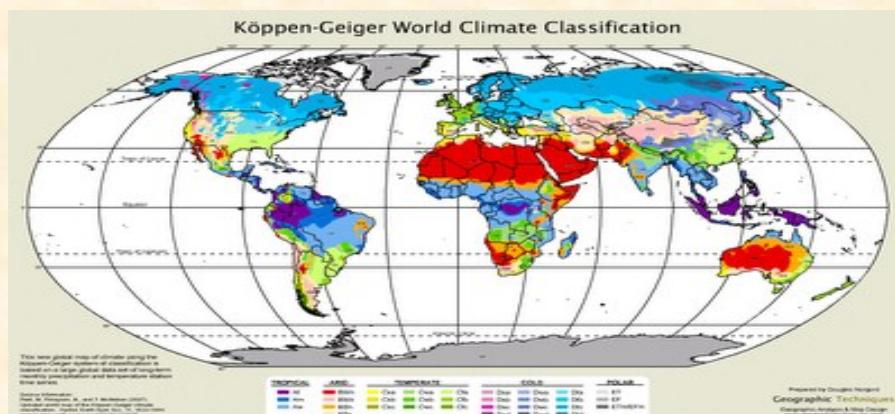
is used to depict various heights and depths. Usually Mountains are brown and water bodies are blue.

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.

2500  
BC



In Babylonia,  
etched into clay  
and displayed  
locations of  
fields, villages,  
rivers, and hills.

## Unusual Courses

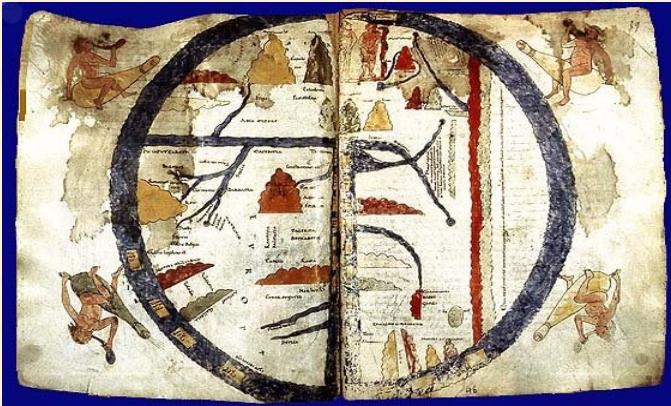
## Cartography

600 BC



It shows Babylon, Euphrates, surrounded by circular landmass with Assyria, Armenia, Ocean and seven Islands arranged around it to form a seven-pointed star.

1100



World map from the Italian monk Beato di Liebana

1490



The “Columbus map” perhaps was drawn by Christopher Columbus before the discovery of the New World, showing the known world in his time.

## Unusual Courses

## Cartography

1700



It is pretty much like modern map, by German geographer and cartographer Johann Baptist Homann.

2000



Physical world map from the Perry-Castañeda Library Map Collection, University of Texas.

2008



GIS Developing  
Follow Me with PHP--Visualize Geodata and create map in raster image.

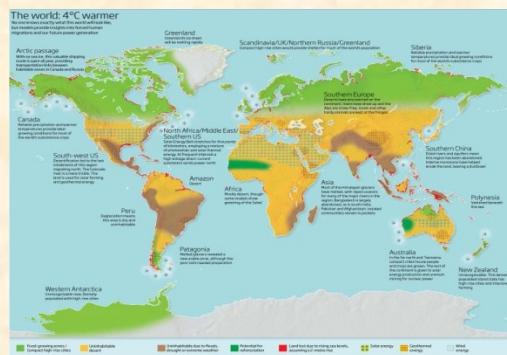
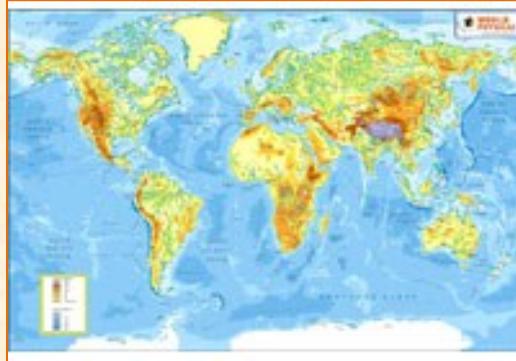
## DIFFERENT TYPES OF MAPS

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

## Unusual Courses

## Cartography

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.



## Cartographic Sciences

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)**

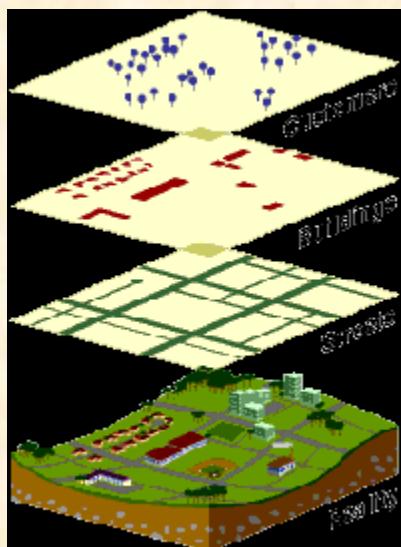
Another new discipline, perhaps the most exciting of all, GIS is a computer-based system for handling geographical data, that is, data relating to the earth's surface.

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.

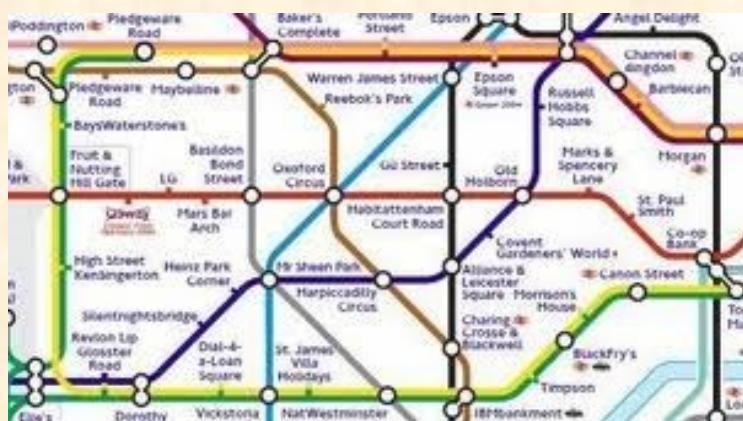
#### Topographic vs. topological

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.



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.

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](http://annamalaiuniversity.ac.in/fact_sci_earthsciences.php)

The fees mentioned are only for 1<sup>st</sup> 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](http://annamalaiuniversity.ac.in/fees_viewmore.php?id=052111)

##### **Address**

##### **ANNAMALAI UNIVERSITY**

Annamalai Nagar - 608 002

Tamil Nadu

India

91 - 4144 - 238248/263/796

91 - 4144 - 238080

+91 - 4144 – 237356/237357

/237358/237359 (Voice-net)

[info@annamalaiuniversity.ac.in](mailto:info@annamalaiuniversity.ac.in)  
[www.annamalaiuniversity.ac.in](http://www.annamalaiuniversity.ac.in)

### **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](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

[apujari@yahoo.com](mailto:apujari@yahoo.com)

[anuppujari@hotmail.com](mailto: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,  
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Panbazar  
Guwahati, Assam, India  
PIN - 781 001

**Phone :**

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

**Email :** [principalcottoncollege@rediffmail.com](mailto: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](mailto:director@iirs.gov.in)

#### **Programme Co-coordinator (Academics)**

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Dehradun - 248 001 (India)

**Tel:** + 91 - (0)135 - 2524105 , 2524106 , 2524107.

**Fax:** + 91 - (0)135 - 2741987 / 2748041

**E-mail:** [pca@iirs.gov.in](mailto:pca@iirs.gov.in)

<http://www.iirs.gov.in/reach.php>

## **6. Indian Institute of Surveying and Mapping**

<http://soisti.ap.nic.in/>

### COURSES ON GEODESY

Sl. No	Course Name	Batch No	Course No	Duration	Commerce	Fees (Rs)	Course Capacity	Eligibility
1	Control and Detail Survey by GPS and Total Station	19	690	8 Weeks	23.06.2010	22,00	12	Graduates or Surveyors by profession
2	Map Update using Mobile Mapping System	05	585	2 Weeks	21.07.2010	8,900	20	Surveyors by Profession

<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](mailto: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](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
- ▶ PhD in Spatial Information Technology

#### **Address**

**Jawaharlal Nehru Technological University Hyderabad**  
Kukatpally, Hyderabad - 500 085,  
Andhra Pradesh, India  
E-Mail : [info@jntu.ac.in](mailto:info@jntu.ac.in)

**Dr. M.Chandra Shekar**

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**Dr. G. Tulasiram Das**

Registrar 32422253 1444 23158665

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### **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](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 & Entrance June  
Month :

#### **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**

<http://www.mjrpuniversity.com/mjrp/public/index.aspx>

#### **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/mjrp/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 :-**

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

[http://www.mjrpuniversity.com/mjrp/public/ContactUs.aspx?  
cid=6](http://www.mjrpuniversity.com/mjrp/public/ContactUs.aspx?cid=6)

### **11. MANGALORE UNIVERSITY**

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

#### **Department of Geoinformatics**

[http://www.mangaloreuniversity.ac.in/xampp/departments/geoinfo  
rmatics.html](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

MANGALORE UNIVERSITY

MANGALAGANGOTRI- P.O

PIN 574199

INDIA

E-mail: [ragvon@yahoo.com](mailto:ragvon@yahoo.com)

Phone: mobile 09845406824

FAX:91-824 2284673  
 FAX:91-824 2287367

## **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**

VC	Vice Chancellor	<a href="mailto:vc@osmania.ac.in">vc@osmania.ac.in</a>
Registrar	Registrar	<a href="mailto:registrar@osmania.ac.in">registrar@osmania.ac.in</a>

### **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](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](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](mailto:info@cartographymaster.eu)  
web: [carto-tum.de](http://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](mailto: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](mailto: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  
Fax: +7 (495) 267 4681  
E-mail: [lgm@miigaik.ru](mailto:lgm@miigaik.ru)

**International Phone:** +7 (495) 261 6243

**Department:** Fax: +7 (495) 267 2518

**E-mail:** [forest@miigaik.ru](mailto:forest@miigaik.ru)

**Directions:**

- Kurskaya Metro Station, Trolleybus Lines A,10
- Baumanskaya Metro Station, Trolleybus Lines 25, 45

<http://www.miigaik.ru/eng/contact.htm>

### 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>

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

#### 18. National Atlas and Thematic Mapping Organization, Kolkata

<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

### **Address**

Dr.B.P. Singh

Dy.Director & Head  
Research Development & Training Division  
National Atlas & Thematic Mapping Organization  
CGO Complex, 7<sup>th</sup> 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](mailto:natmordtd@gmail.com)  
Website: [www.natmo.gov.in](http://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**

Course Code:	STL03
Course Duration:	20 hours
Training Center:	Kolkata/Hyderabad Fee 1350

### **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)  
Basics of Remote Sensing  
Electromagnetic Energy

Basics of Global Positioning System  
Fundamentals of Photogrammetry

### Digital cartography using ArcGIS

Course Code:	STL04 A
Course Duration:	2 months (150 hours)
Training Center:	Kolkata/Hyderabad

#### 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 back ground

### 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

Course Duration:

2 months (150 hours)

Training Center:

Kolkata/Hyderabad

### Overview

This subject introduces the student to the techniques for creating scaled maps in MapInfo 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 back ground

### 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](mailto: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

<http://www.khagolam.com/InstrctorLed.aspx>

### Address

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

Email : [info@khagolam.com](mailto: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

<http://www.cartographersguild.com/showthread.php?1033-New-to-Digital-Cartography-Software-General-Information>

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**

<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/geo-symbol>

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.

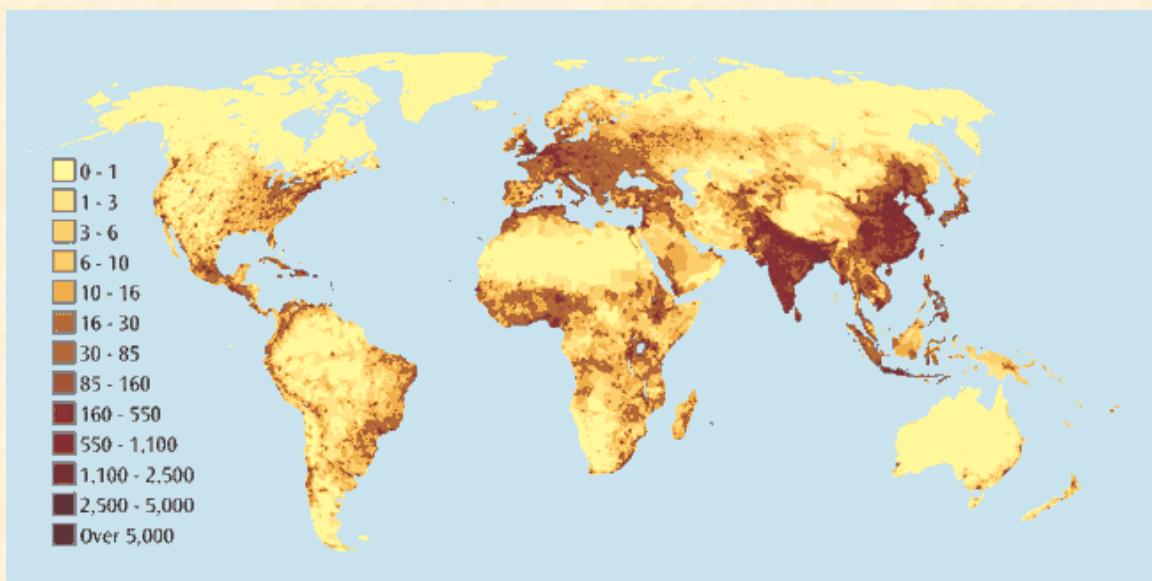
This article is in the form of a tutorial to get you quickly started creating your own maps

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

### **6. Learn2Map Free GIS Tutorial and Shapefile Atlas**

<http://www.mapcuzin.com/free-learn-to-map-gis-tutorial-and-shapefile-atlas.htm>

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

<http://www.un.org/Depts/Cartographic/english/htmain.htm>

#### **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](http://www.agi.org.uk)