



Announcement Brochure

IIRS Outreach Programme

Basics of Remote Sensing, Geographical Information System and Global Navigation Satellite System

August 21 – December 01, 2017

Organised by

Indian Institute of Remote Sensing
Indian Space Research Organisation
Department of Space, Govt. of India
Dehradun

<http://www.dlp.iirs.gov.in>



About IIRS

Indian Institute of Remote Sensing (IIRS), a unit under Indian Space Research Organization (ISRO), Department of Space, Government of India is a premier Training and Educational Institute set-up for developing trained professionals in the field of Remote Sensing, Geoinformatics and GNSS Technology for Natural Resources, Environmental and Disaster Management. Formerly known as Indian Photo-interpretation Institute (IPI), founded in 1966, the Institute boasts to be the first of its kind in entire South-East Asia. While nurturing its primary endeavor to build capacity among the user community by training mid-career professionals, the Institute has enhanced its capability and evolved many training and education programmes that are tuned to meet the requirements of various target user groups in the society, ranging from fresh graduates to policy makers including academia.

The training and education programmes at IIRS includes the short duration customized courses, PG Diploma, Master's Degree (M.Tech and M.Sc.) in various disciplines. IIRS also conducts distance learning programmes under IIRS Outreach Activity.

IIRS Outreach Programme

IIRS Outreach Programme focusses on strengthening the Academia and User Segments in Space Technology & Its Applications using Online Learning Platforms. IIRS distance learning program was initiated in 2007 with the participation of twelve universities in India. Till date, IIRS has successfully conducted 22 programs through live and interactive classrooms (also known as EDUSAT programme) and also launched five online courses under e-learning programme. Currently IIRS distance learning programme is being conducted through following modes:

- 1. Live and Interactive classroom sessions (<http://dlp.iirs.gov.in>)*
- 2. E-learning based online courses (<http://elearning.iirs.gov.in>)*

Live and Interactive classroom

*The use of Remote Sensing, Geographical Information System, Global Navigation Satellite System and associated geospatial technologies is increasing rapidly, creating an urgent demand for trained manpower. The live and interactive mode of distance learning is enabled through Internet and A-view software platform developed by Amrita e-learning Lab in collaboration with Ministry of Human Resource Development (MHRD) Government of India. **The programs are available through Internet without any cost to the user. The live and interactive sessions will be conducted by experts from IIRS-ISRO and other knowledge Institutions. IIRS has successfully conducted 22 such courses so far with participation of over 46590+ participants from 626+ academic institutions, government departments and industry. The beneficiaries of the programme may include:***

- ❖ Central/State/Private Universities & Academic Institutions;*
- ❖ Central & State Government Organizations/Departments;*
- ❖ Research Institutes;*
- ❖ Geospatial Industry;*
- ❖ NGOs.*

IIRS also conducts various theme oriented online courses and monthly webinars on recent topics on geospatial technologies and its applications. Users are encouraged to actively participate on these programs. For more detail please visit IIRS official website- www.iirs.gov.in

Course Announcement

IIRS announces four courses commencing from **August 21st, 2017**

- ❖ **Remote Sensing and Digital Image Analysis** (21/08/2017 to 15/9/2017): Basic Principles of Remote Sensing, Earth Observation Sensors and Platforms, Spectral Signature of different land cover features, Image interpretation, Thermal & Microwave Remote Sensing, Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement, Classification and accuracy assessment techniques.
- ❖ **Global Navigation Satellite System and Geographical Information System** (25/09/2017 to 10/11/2017): Introduction to GPS and GNSS, receivers, processing methods, errors and accuracy, GIS, databases, topology, spatial analysis and open source software.
- ❖ **RS and GIS Applications** (13/11/2017 to 01/12/2017): Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources.
- ❖ **Basics of Remote Sensing, GIS and GNSS** (21/08/2017 to 01/12/2017): Comprehensive course consisting of above three courses.

The participants can register for **individual course** of their choice or the **entire Programme**.

Target Participants

- ❖ Student of Undergraduate and Postgraduate courses (any year);
- ❖ Technical/ Scientific Staff of Central/ State Government Ministries/ Departments;
- ❖ Faculty / Researchers at university / Institutions.

Course Study Material

Course study materials such as lecture slides, video recorded lectures, open source software, data & handouts of demonstrations, etc., will be made available through IIRS **ftp** link (<ftp://ftp.iirs.gov.in>) Video lectures will also be uploaded on YouTube Channel (<http://www.youtube.com/user/edusat2004>).

Course Fee

There is **no course fee**.

Course Registration

Course updates and other details will be available on URL- <http://www.dlp.iirs.gov.in>

- ❖ To participate in the program, organizations/universities/departments/ Institutes have to identify a Coordinator at their end. The coordinator is required to register his/her Institute as nodal centre at: (http://elearning.iirs.gov.in/edusat_lms/cordinator_registration.php).
- ❖ All the participants have to register online through registration page (http://elearning.iirs.gov.in/edusat_lms/student_registration.php) by selecting his/her organization as nodal centre.
- ❖ The Coordinator is required to approve the participants from his/her institute for each course.

Course Funding & Technical Support

The programme is sponsored by Indian Space Research Organization, Department of Space, Government of India and is conducted with due technical support from Amrita Virtual & Interactive E-learning World (A-VIEW).

Programme Reception

Programme can be received through Internet connectivity of 2Mbps or better. Following hardware and software set-up is required at user end:

Hardware Requirements:

- ❖ High-end Computer/Laptop (Windows OS);
- ❖ Good quality web camera (optional);
- ❖ Headphone with Microphone (optional) and Speakers;
- ❖ Large Display Screen (Projector or TV).

Software and Internet Requirements:

- ❖ Desktop based: **A-VIEW software** (free to download from www.aview.in or IIRS ftp link: <ftp://ftp.iirs.gov.in>)
- ❖ Online live access through <http://live.iirs.gov.in> with free registration.

Connectivity & Other configurations:

- ❖ NKN or any other high speed internet facility (preferably without firewall, with minimum of **2 Mbps bandwidth**)
- ❖ Network requirements: **Port 80** and **RTMP (port 1935)** protocol should be unblocked from user's computer and Firewall.

Note: Participating Institutions have to bear total expenses for establishment of the classroom facility.

Award of Certificate

Working Professionals: Based on 70% attendance and submission of assignments.

Students: Based on 70% attendance and online examination.

Feedback Mechanism

The participants and participating organizations are invited to attend annual IIRS User Interactive Meet (IUIM) at IIRS Dehradun. The participants can submit their feedback online through IIRS e-learning portal. Feedbacks are critically analyzed and implemented in next courses.



Outreach Programme Feedback Session during
IIRS User Interaction Meet (IUIM)-2017



IIRS received two national awards for excellence in training for outreach and e-learning programme by Department of Personnel & Training (DoPT), Govt. of India in collaboration with United Nations Development Programme (UNDP).

Contact Details

IIRS Distance Learning Centre

Indian Institute of Remote Sensing, Indian Space Research Organization

Department of Space, Govt. of India, 4-Kalidas Road, Dehradun-248001

Email: dlp@iirs.gov.in; **Tel:** 0135-2524130/4354/4115; **Mobile:** 9410924417, 7895309151

Monday to Friday (9:30 AM to 05:00 PM)





**Twenty-third IIRS Outreach Programme
On
Basic of RS, GIS & GNSS**

Tentative Schedule

Sl No.	Module Name	From	To
1	Remote Sensing and Digital Image Analysis	22-08-2017	15-09-2017
2	Global Navigation Satellite System & Geographical Information System	25-09-2017	10-11-2017
3	RS & GIS Applications	13-11-2017	04-12-2017

Technical Support from
A-VIEW, Amrita University, Coimbatore

July, 2017

Module 1: Remote Sensing & Digital Image Analysis Module/ Course Coordinator: Ms. Minakshi Kumar				
Date	Day	Time	Topic	Speaker
21 Aug 17	Monday	1600-1730 hrs	Course Inauguration and Introductory Lecture	Dr. A. Senthil Kumar
22 Aug 17	Tuesday	1600-1730 hrs	Basic Principles of Remote Sensing	Mrs. Manu Mehta
23 Aug 17	Wednesday	1600-1730 hrs	Earth Observation Sensors and Platforms	Mr. Vinay Kumar
24 Aug 17	Thursday	1600-1730 hrs	Thermal Remote Sensing	Dr. Yogesh Kant
25 Aug 17	Ganesh Chaturthi			
26 Aug 17	Saturday			
27 Aug 17	Sunday			
28 Aug 17	Monday	1600-1730 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation	Dr. Hina Pande
29 Aug 17	Tuesday	Offline (Morning Session)	RS and Image Interpretation Practical	By University Coordinator
30 Aug 17	Wednesday	BREAK		
31 Aug 17	Thursday	1600-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration	Mrs. Minakshi Kumar
01 Sep 17	Friday	1600-1730 hrs	Image Enhancement techniques	Dr. Poonam S. Tiwari
02 Sep 17	Saturday			
03 Sep 17	Sunday			
04 Sep 17	Monday	BREAK-ONAM		
05 Sep 17	Tuesday	1600-1730 hrs	Image Classification Techniques and Accuracy Assessment	Dr. Poonam S. Tiwari
06 Sep 17	Wednesday	1600-1730 hrs	Microwave Remote Sensing	Mr. Shashi Kumar
07 Sep 17	Thursday	1600-1730 hrs	Hyperspectral Remote Sensing	Mrs. Shefali Agarwal
08 Sep 17	Friday	Offline - as per computer lab availability Morning Session	Image Processing Hands-on and Practical Assignment	By University Coordinator
09 Sep 17	Saturday			
10 Sep 17	Sunday			
11 Sep 17	Monday	1600-1730 hrs	Demonstration: Image Processing	Mrs. Minakshi Kumar
12 Sep 17	Tuesday	Offline - as per computer lab availability	Practical Assignment submission by Participants to respective coordinators and evaluation to be done by respective coordinators	
13 Sep 17	Wednesday	1600-1730 hrs	Panel Discussion Moule-1	Faculty of Module-1
14 Sep 17			BREAK For Examination	
15 Sep 17	Friday	9:30 Hrs to 17:00 Hrs	Online Examination of Module-1	Edusat Team

Module- 2 Global Navigation Satellite System and Geographical Information System□Module/ Course Coordinator: Shri Ashutosh Bhardwaj & Shri Prasun Kumar Gupta				
25 Sep 17	Monday	1600-1730 hrs	Introduction to GPS and GNSS	Er. Ashutosh Bhardwaj
26 Sep 17	Tuesday	1600-1730 hrs	GPS receivers, processing methods, errors and accuracy	Er. Ashutosh Bhardwaj
27 Sep 17	Wednesday	1600-1730 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Er. Ashutosh Bhardwaj
28 Sep 17	Thursday	1600-1730 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Shri S. Raghavendra
29 Sep 17			BREAK	
30 Sep 17	Dussehra -Saturday			
01 Oct 17	Sunday			
02 Oct 17	Monday		Gandhi Jayanthi	
Date	Day	Time	Topic	Speaker
03 Oct 17	Tuesday	1600-1730 hrs	Indian Regional Navigation Satellite System (IRNSS)	Er. Ashutosh Bhardwaj & Shri Kamal Pandey
04Oct 17	Wednesday	1600-1730 hrs	DGPS demonstration (Pre-recorded followed by live query session)	Shri S. Raghavendra
05 Oct 17	Thursday	1600-1730 hrs	Mobile Mapping	Dr. Harish Chandra Karnatak
06 Oct 17	Friday		BREAK	
07 Oct 17	Saturday			
08 Oct 17	Sunday			
Geographical Information System Module/ Course Coordinator: Shri Prasun Kumar Gupta				
09 Oct 17	Monday	1600-1730 hrs	Introduction to GIS	Dr. Sameer Saran
10 Oct 17	Tuesday	1600-1730 hrs	Geographic Phenomena, Concepts and examples	Shri P K Gupta
11 Oct 16	Wednesday		Break	
12 Oct 17	Thursday	1600-1730 hrs	Data Inputting and Editing in GIS	Shri Shiva Reddy
13 Oct 17	Friday	1600-1730 hrs	GIS Data Models (Spatial and Non spatial)	Shri Ashutosh Kumar Jha
14 Oct 17	Saturday			
15 Oct 17	Sunday			
16 Oct 17	Monday	1600-1730 hrs	Map Projection Concepts & Use in RS & GIS	Dr. Ashutosh Srivastav
17 Oct 17	Tuesday	1600-1730 hrs	Spatial Analysis- Introductory Concepts and Overview	Shri Prabhhar Alok Verma
18 Oct 17	BREAK			
19 Oct 17	Diwali			
20 Oct 17	BREAK			
21 Oct 17	Saturday			
22 Oct 17	Sunday			
23 Oct 17	Monday	1600-1730 hrs	Spatial Analysis- Functionality and Tools	Shri Kapil Oberai
24 Oct 17	Tuesday	1600-1730 hrs	Demo of QGIS Software – Session 01: • Adding GIS Data ,Attribute table & identity tool • Change symbology, Create map composers • Manage plugins, CRS & EPSG • Geo-referencing & Tie-points , RMSE & Rectification	Shri P K Gupta
25 Oct 17	Wednesday	1600-1730 hrs	Demo of QGIS Software – Session 02: (Data Creation/Vector Generation) • Digitization ,Setting digitizing environment • Adding attributes to layer, Editing digitized layer • Attribute Queries, Spatial Queries Linking spatial & non-spatial data	Shri P K Gupta
26 Oct 17	Thursday	1600-1730 hrs	Open Source S/w Technology & Tools	Shri P K Gupta
27 Oct 17	Friday	1600-1730 hrs	Data Quality & Policies OGC, NSDI & GSDI initiatives. Discussion on Internet resources	Dr. Harish Karnatak
28 Oct 17	Saturday			

29 Oct 17	Sunday			
30 Oct 17	Monday	1600-1730 hrs	Spatial Data Management using RDBMS-Demo on PostGRE SQL+ Post GIS	Shri Kapil Oberai
31 Oct 17	Tuesday	1600-1730 hrs	3D GIS and Application including Trivim	Shri Shiva Reddy
01 Nov 17	Break			
02 Nov 17	Thursday	1600-1730 hrs	Geo-Web Services: Technical Concepts and Applications	Dr. Harish Karnatak
03 Nov 17	Friday		Uncertainty in GIS and Error Propagation	Shri Hari Shankar
04 Nov 17	Saturday – Guru Nanak Birthday			
05 Nov 17	Sunday			
06 Nov 17	Monday	1600-1730 hrs	Customization in GIS	Shri Kamal Pandey
07 Nov 17	Tuesday	1600-1730 hrs	Recent Trends in Geoinformatics	Dr. Sameer Saran
08 Nov 17	Wednesday	1600-1730 hrs	Panel Discussion of Module 2	Faculty of Module-2
09 Nov 17	Thursday		Break	
10 Nov 17	Friday	9:30 Hrs to 17:00 Hrs	Online Exam - Global Navigation Satellite System and Geographical Information System	Edusat Team

Module-3 RS & GIS Applications Module/ Course Coordinator: Dr. Arijit Roy				
Date	Day	Time	Topic	Speaker
13 Nov 17	Monday	1600-1730 hrs	Space Technology & its applications in governance	Dr. S. K Srivastav
14 Nov 17	Tuesday	1600-1730 hrs	Remote Sensing and GIS Applications in Soil Resource Assessment	Dr. Suresh Kumar
15 Nov 17	Wednesday	1600-1730 hrs	Remote Sensing Applications in Agriculture- Crop Inventory & Yield Forecasting	Dr. N.R. Patel
16 Nov 17	Thursday	1600-1730 hrs	RS & GIS Applications in Forestry and Ecology	Dr. Sarnam Singh
17 Nov 17	Friday	1600-1730 hrs	Engineering Geology with emphasis on landslide studies	Dr. Shovan Chattoraj
18 Nov 17	Saturday			
19 Nov 17	Sunday			
20 Nov 17	Monday	1600-1730 hrs	Geology and Geomorphology	Dr. R.S. Chatterjee
21 Nov 17	Tuesday	1600-1730 hrs	Space-enabled Products & Services for Disaster Management :Indian Initiatives	Dr. P.K.C.Ray
22 Nov 17	Wednesday	1600-1730 hrs	Geospatial Technology for climate change studies	Dr. Arijit Roy
23 Nov 17	Thursday	1600-1730 hrs	RS & GIS Applications to Water Resources Management	Dr. S.P Aggarwal
24 Nov 17	Friday	1600-1730 hrs	RS & GIS for Coastal Zone Management	Dr. D. Mitra
25 Nov 17	Saturday			
26 Nov 17	Sunday			
27 Nov 17	Monday	1600-1730 hrs	Remote Sensing Application to Atmospheric & Marine Environment	Dr. A.K Mishra
28 Nov 17	Tuesday	1600-1730 hrs	RS & GIS Application in Urban & Regional Planning	Dr. Pramod Kumar
29 Nov 17	Wednesday	1600-1730 hrs	Geo-web Services and mobile GIS in governance	Dr. Harish Karnatak
30 Nov 17	Thursday	1600-1730 hrs	Panel Discussion Module-3	Faculty of Module-3
04 Dec 17	Monday	9:30 Hrs to 17:00 Hrs	Online Examination -RS & GIS Applications	Edusat Team

IIRS Outreach Programme

The IIRS outreach programme, which started in 2007 with 12 universities/ institutions has now grown substantially. Currently, 631 universities / institutions spread across India are networked with IIRS. The beneficiaries of the programme may include:

- Water Resource Professionals
- State Water Resources/Irrigation Departments/Training Academies
- Central/State/Private Universities & Academic Institutions
- Central & State Government Departments
- Research Institutes
- Geospatial Industries
- NGOs

Feedback Mechanism

IIRS has conducted six workshops in 2007, 2009, 2010, 2013, 2014, 2015, 2016 and 2017 to take feedback from participating institutions to improve the quality of future course



18th outreach programme feedback session during IIRS User Interaction Meet (IUIIM)-2017

Awards

IIRS has received national awards for excellence in training for outreach and e-learning programme during 1st National Symposium on Excellence in Training conducted during April 11-12, 2015 in New Delhi by Department of Personnel & Training (DoPT), Govt. of India in collaboration with United Nations Development Programme (UNDP).



About IIRS

Indian Institute of Remote Sensing (IIRS) under Indian Space Research Organisation (ISRO), Department of Space, Govt. of India is a premier Training and Educational Institute set up for developing trained professionals in the field of Remote Sensing, Geoinformatics and GNSS Technology for Natural Resources, Environmental and Disaster Management. Formerly known as Indian Photo-interpretation Institute (IPI), founded in 1966, the Institute boasts to be the first of its kind in entire South-East Asia. While nurturing its primary endeavour to build capacity among the user community by training mid-career professionals, the Institute has enhanced its capability and evolved many training and education programmes that are tuned to meet the requirements of various target groups, ranging from fresh graduates to policy makers including academia.

IIRS also conducts e-learning programme on Remote Sensing and Geo-information Science (<http://elearning.iirs.gov.in>).

Contact Details

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Shri. Vinay Kumar
Course Coordinator
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Email: vinaykumar@iirs.gov.in

IIRS DLP Team

Dr. Harish Karnatak
Head, GIT& DL Dept.

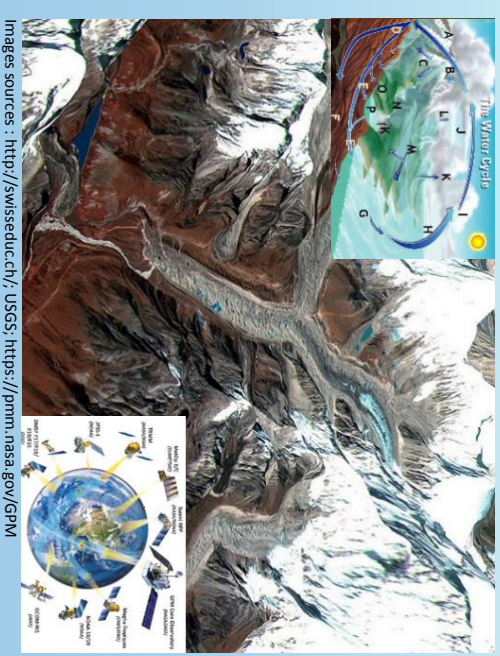
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Twenty Fifth IIRS Outreach Programme



Images sources : <http://swisseduc.ch/>, USGS, <https://pmm.nasa.gov/GPM>

Hyperspectral Remote Sensing and Its Applications

September 18 – 21, 2017



Organised by

Indian Institute of Remote Sensing

Indian Space Research Organisation
Department of Space, Govt. of India

Dehradun

www.iirs.gov.in

About the Course

Hyperspectral remote sensing deals with measurements in a large number of narrow spectral bands over a contiguous spectral range. Because of its ability to detect narrow absorption features hyperspectral data are related to specific vegetation physiological characteristics, soil physical and chemical properties, chemical characteristics, soil physical and chemical properties, mineral composition and snow characteristics, mapping tree species, recognizing invasive plants, and identifying key geologic features. However, because of presence of a large number of bands, hyperspectral data needs different analysis approach including feature reduction, feature selection, removal of noise, detection of absorption features, advance classification techniques. This course will make the participants aware about hyperspectral remote sensing, hyperspectral data processing and its applications. This course will have thirteen sessions. First to eighth sessions will mainly be focused on topics related to hyperspectral remote sensing, ground spectro-radiometer and processing techniques; while ninth to thirteenth sessions will focus on application of hyperspectral data in five application areas.

Curriculum

- **First Session: Hyperspectral Remote Sensing (HRS): An Overview and Applications;**
- **Second Session: Hyperspectral remote sensing: Platform and sensors;**
- **Third Session: Hyperspectral Image Pre-processing;**
- **Fourth Session: Demonstration on Hyperspectral Data Pre-processing;**
- **Fifth Session: Data dimensionality reduction;**
- **Sixth Session: Optical and Thermal Hyperspectral Image Classification;**
- **Seventh Session: Demonstration on spectro-radiometer and spectral library creation;**
- **Eighth Session: Demonstration on Hyperspectral data classification;**
- **Ninth Session: Hyperspectral Remote Sensing for Agriculture and soil Studies;**
- **Tenth Session: Hyperspectral Remote Sensing for Forestry Applications;**

- **Eleventh Session: Hyperspectral remote Sensing for Geological Applications;**
- **Twelfth Session: Hyperspectral Remote Sensing for Urban Studies;**
- **Thirteenth Session: Hyperspectral Remote Sensing for Water and snow cover Studies;**

Target Participants

- The course is designed for professionals from Central/ Sate Govt./Private Organizations/NGO engaged in remote sensing technology and its application in various fields like; forestry, agriculture, geology, mineral studies, water resources study.
- The course participants have to be duly sponsored by their university / institution and application should be forwarded through coordinators from respective Organisations/centres. Users attending programmes under CEC-UGC/ CIET / other networks can also participate. Institutions on high speed National Knowledge Network (NKN) can also participate using A-VIEW software.

Course Study Material

Course study materials like lecture slides, video recorded lectures, open source software & handouts of demonstrations, etc. will be made available through IIRS ftp link. Video lectures will also be uploaded on YouTube Channel (<http://www.youtube.com/user/edusat2004>).

Course Fee

There is no course fee.

Course Registration

- Course updates and other details will be available on URL- <http://dlp.iirs.gov.in>
- To participate in this programme the interested organizations/ universities/ departments/ Institutes has to identify a coordinator at their end. The identified coordinator will register online his/her Institute as nodal center in IIRS website.
- All the participants has to register online through registration page by selecting his/her organization as nodal center.

Course Funding & Technical Support

The programme is sponsored by National Natural Resources Management System – Standing Committee on Training and Education (SC-TE), Indian Space Research Organisation, Department of Space, Government of India and is conducted with due technical support from Amrita Virtual Interactive E-learning World (A-VIEW).

Programme Reception

Programme can be received through Internet connectivity of 2Mbps or better. Following hardware and software set-up is required at user end:

Hardware Requirements :

High-end Computer/Laptop (Windows OS);
Good quality web camera ;
Headphone with Microphone;
Speakers ;
Large Display Screen (Projector or TV) .

Software and Internet Requirements

Desktop based: A-VIEW software (free to download from www.aview.in or IIRS ftp link: <ftp://ftp.iirs.gov.in>)

Online live access through <http://live.iirs.gov.in> with free registration.

Connectivity & Other configurations:

NKN or any other high speed Internet facility (preferably without firewall, with minimum of 2 Mbps bandwidth)
Network requirements: Port 80 and RTMP (port 1935) protocol should be unblocked from user's computer and Firewall.

Note: Institutions/ universities have to bear total expenses for establishment of the classroom facility

Award of Certificate

Working Professionals: Based on 70% attendance and submission of assignments.

Students: Based on 70% attendance and online examination.