

Electronics and Communication Engineering

Faculty Innovations in Teaching and Learning Process

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Faculty Regular Innovative Methods in Teaching and Learning

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Following are the innovative tools used by the Faculty in Teaching and Learning Process

1. ICT/Multimedia Learning Process

- The faculty use multimedia elements which include video based learning, web based learning and PPTs in the classroom, to present the content in a more effective way and make the techniques of teaching a significant one.
- Demonstration with the working models, charts, components etc., in the class room for better understanding and conducting the seminars, group discussions, quiz etc.
- Faculty and Students can access lecture notes, PPT's, NPTEL video lectures that can be accessible in the institutional website.

Faculty members uploaded lecture notes, PPTs, Materials and supporting documents in institutional website, so students can access e-learning resources.

<http://www.nrigroupofcolleges.com/e-resources-ece.html>

Table 1.1 Lecture Notes, PPTs Links for Faculty and Students

| S. No | Name of the Subject | Innovative method followed |
|-------|----------------------------------------------|----------------------------|
| 1 | Antennas & Wave Propagation | Lecture Notes, |
| 2 | Bio Medical Engineering | Lecture Materials |
| 3 | Computer Architecture & Organization | Lecture Notes |
| 4 | Electro Magnetic Fields & Transmission lines | Lecture Notes |
| 5 | Microprocessors & Microcontrollers | Lecture Notes, Material |
| 6 | Optical Communications | Lecture Notes |
| 7 | Radar Systems | Lecture Materials, PPTs |
| 8 | Random Variables & Stochastic Process | Lecture Notes, Material |
| 9 | Signals & Systems | Lecture Notes |

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|----|--------------------------------|---------------------------|
| 10 | Wireless Sensor and Networks | Lecture Materials, PPTs |
| 11 | IC Lab Manual | Sample Lab Manual |
| 12 | PDC Lab Manual | Sample Lab Manual |
| 13 | Satellite Communications | Lecture Materials, PPTs |
| 14 | Digital Image Processing | Lecture Materials, PPTs |
| 15 | Electronic Devices & Circuits | Lecture Materials, PPTs |
| 16 | Cellular Mobile Communications | Lecture Materials, PPTs |
| 17 | Electronic Circuit Analysis | Lecture Materials |
| 18 | Pulse & Digital Circuits | Lecture Materials, PPTs |
| 19 | Control Systems | Lecture Materials |
| 20 | Digital Logic Design | Lecture Materials |
| 21 | DSD DICA | Lecture Notes |
| 22 | STLD | Lecture Notes & Materials |
| 23 | VLSI | Lecture Notes |

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Table 1.2 NPTEL Links

| Name of The Subject | NPTEL Link |
|---------------------------------------------|---------------------------------------------------------------------------------------------|
| Electronic Devices and Circuits | http://nptel.ac.in/courses/117105077/1 |
| Signals and Systems | http://nptel.ac.in/courses/117101055/1 |
| Switching Theory and Logic Design | http://nptel.ac.in/courses/117106086/1 |
| Electronic Circuit Analysis | http://nptel.ac.in/courses/117106088/1 |
| Electro Magnetic Waves & Transmission Lines | http://nptel.ac.in/courses/108106073/1 |
| Random Variable and Stochastic Process | http://nptel.ac.in/courses/117104117/1 |
| Pulse and Digital Circuits | http://nptel.ac.in/courses/117106114/1 |
| Antenna Wave Propagation | http://nptel.ac.in/courses/117101057/1 |
| Linear IC Applications | http://nptel.ac.in/courses/117106030/1 |
| Digital IC Applications | http://nptel.ac.in/courses/117105080/1 |
| Digital Communications | http://nptel.ac.in/courses/117101051/1 |
| Digital Signal Processing | http://nptel.ac.in/courses/117105055/1 |
| Bio Medical Engineering | http://nptel.ac.in/courses/102107028/1 |
| Micro Processor and Micro Controller | http://nptel.ac.in/courses/106108100/1 |
| Optical Communications | http://nptel.ac.in/courses/117101002/1 |
| Very Large Scale Integration | http://nptel.ac.in/courses/117101105/1 |
| Micro Wave Engineering | http://nptel.ac.in/courses/117105122/1 |
| Digital Image Processing | http://nptel.ac.in/courses/117105079/1 |
| Radar Systems | http://nptel.ac.in/courses/101108056/1 |
| Cellular Mobile Communications | http://nptel.ac.in/courses/117104099/1 |
| Electronic Measurement and Instrumentations | http://nptel.ac.in/courses/117108043/1 |

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|--------------------------|---------------------------------------------------------------------------------------------|
| Satellite Communications | http://nptel.ac.in/courses/117105131/1 |
| Wireless Sensor Networks | http://nptel.ac.in/courses/117102062/1 |

The screenshot shows a web browser displaying the NRI Institute of Technology website. The URL is <https://www.nrigroupofcolleges.com/e-resources-ecce.html>. The page features a navigation menu with options like 'Resources', 'Academics', and 'Departments'. A central banner highlights 'INTERNSHIP Oriented' and 'Autonomous Institution'. Below this, a section titled 'e-RESOURCES - Department of Electronics & Communication Engineering' contains a table of course links.

| Name of the Course | Web-Link |
|---------------------------------------------|-------------------------------------------------|
| Antennas & Wave Propagation | Click Here For More Information |
| Ec Medical Engineering | Click Here For More Information |
| Computer Architecture & Organization | Click Here For More Information |
| Electro Magneto Fields & Transmission Lines | Click Here For More Information |
| Microprocessors & Microcontroller | Click Here For More Information |
| Optical Communications | Click Here For More Information |
| Radar Systems | Click Here For More Information |
| Random Variables & Stochastic Processes | Click Here For More Information |
| Signals & Systems | Click Here For More Information |
| Wireless Sensor & Networks | Click Here For More Information |
| UG Lab Manual | Click Here For More Information |
| FDC Lab Manual | Click Here For More Information |

Fig 1.1 Screenshot of E-Resources links for subject materials in College Website.

2. E-based Learning

➤ Students can access these links for their self-study, and also to get additional knowledge apart from curriculum. Students access these links through digital library.

I. <http://ieeexplore.ieee.org>

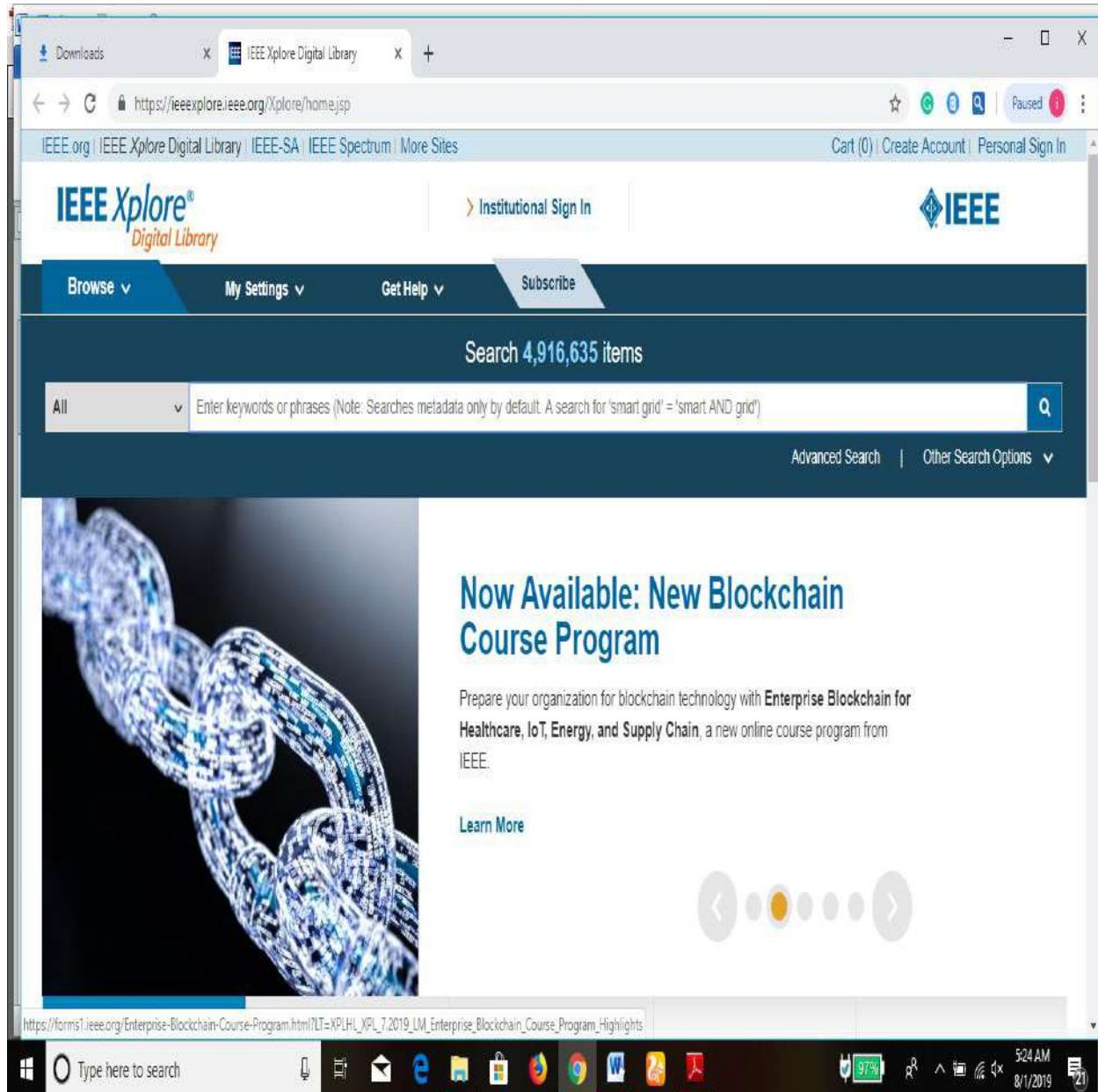


Fig. 2.1 Screenshot of IEEE Website

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II. <http://accessengineeringlibrary.com>

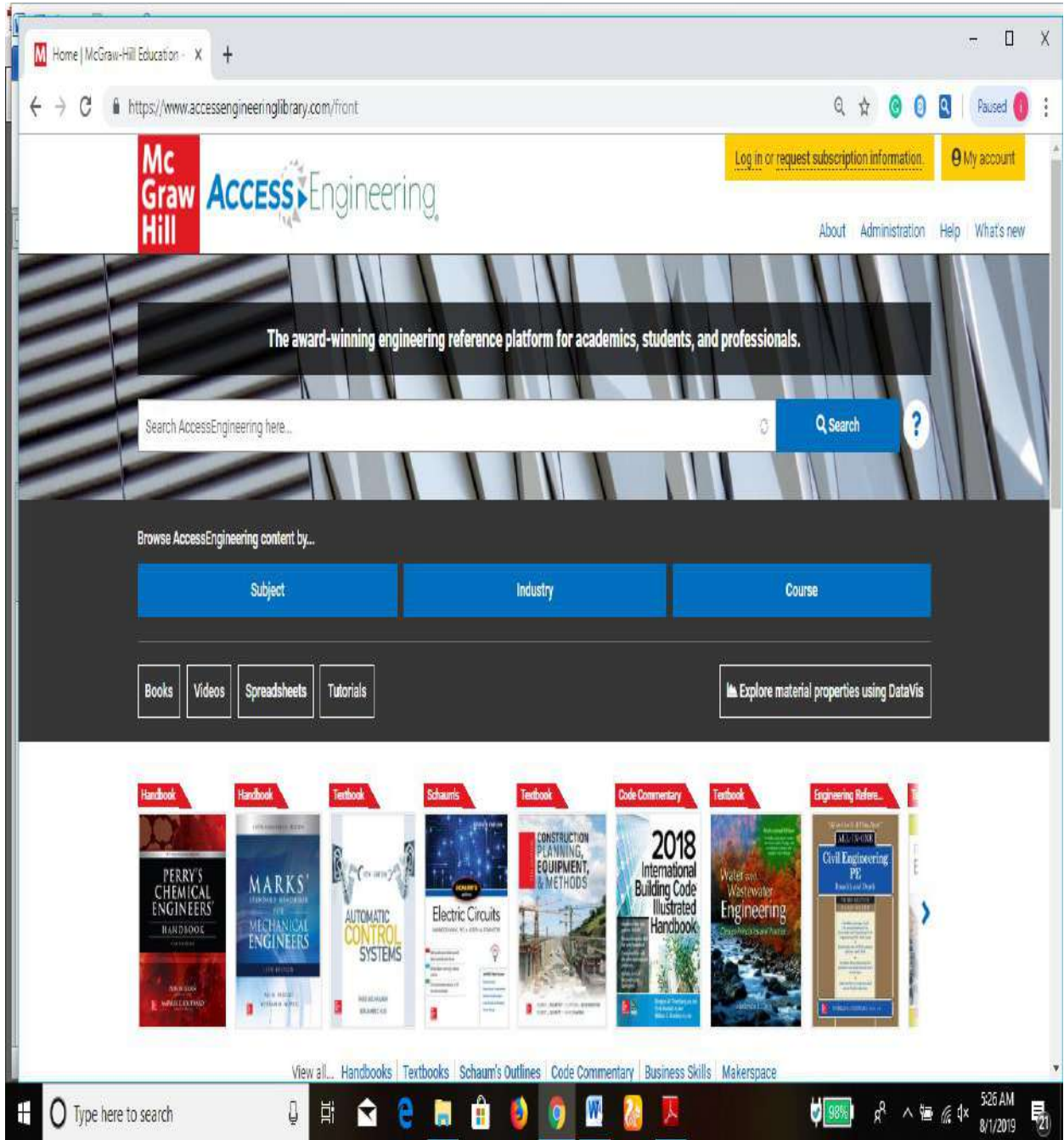


Fig. 2.2 Screenshot of Access Engineering Library.

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III. <http://www.sciencedirect.com>

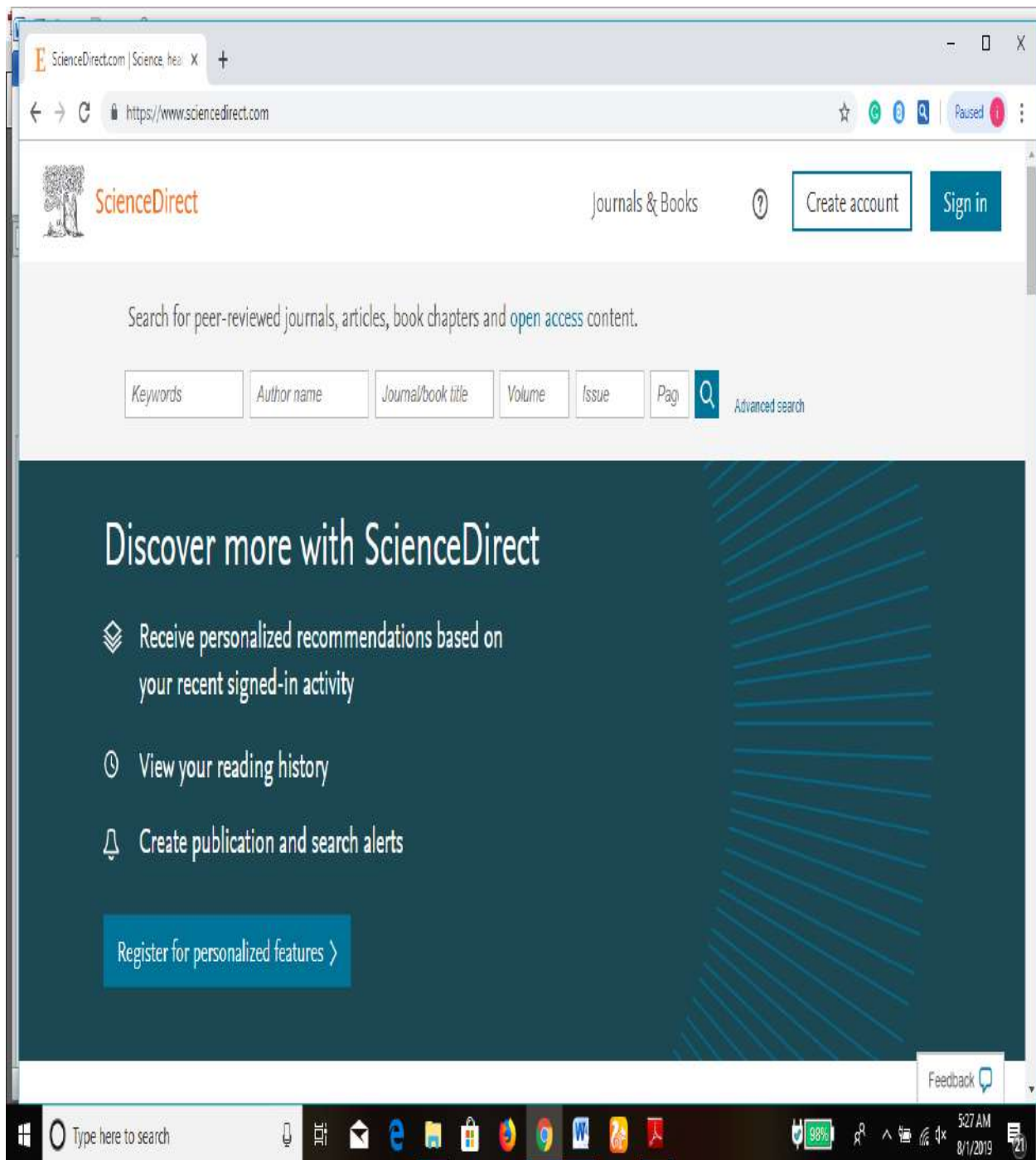


Fig. 2.3 Screenshot of Sciencedirect.com.

IV. <https://ndl.iitkgp.ac.in/>

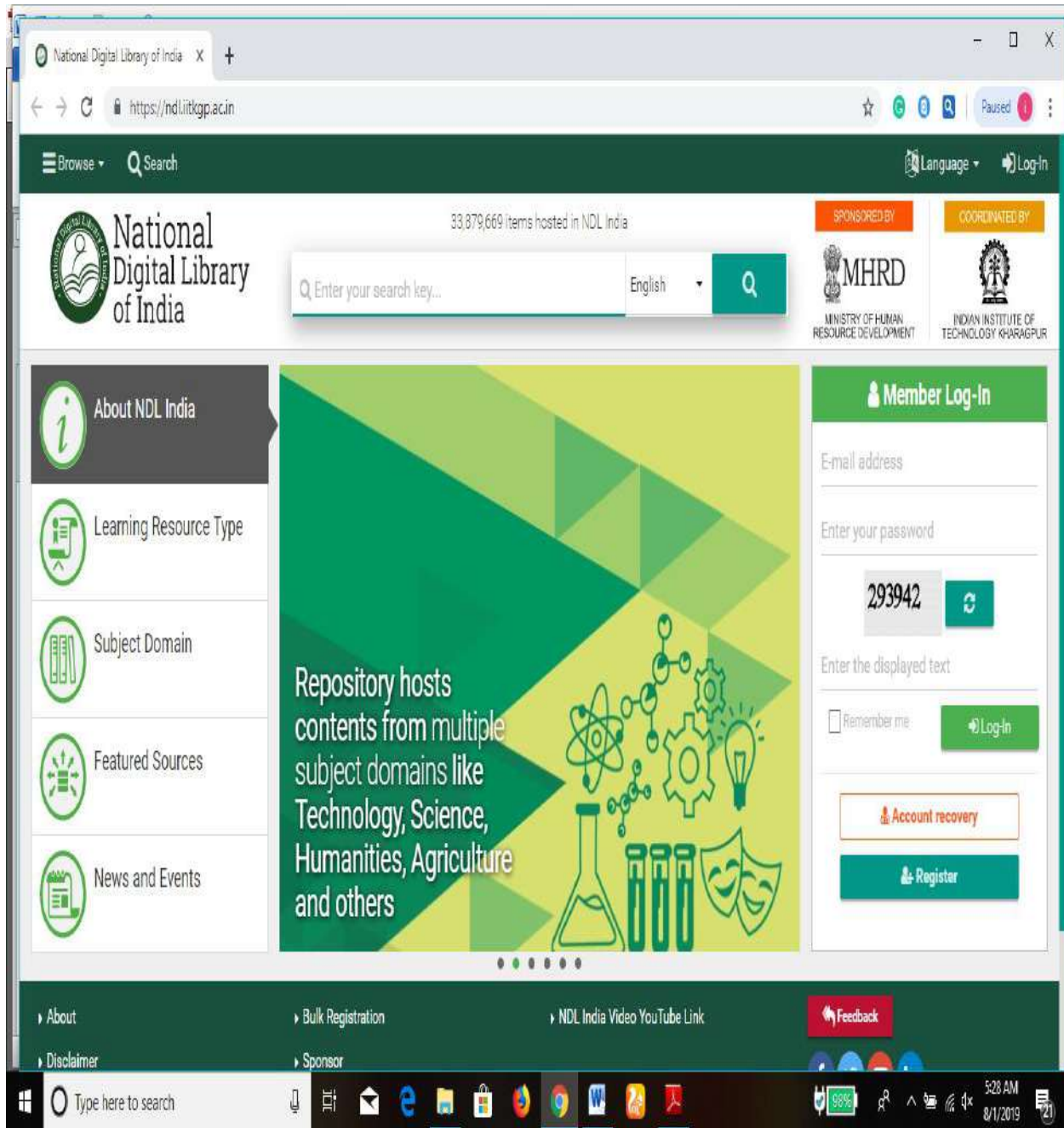


Fig. 2.4 Screenshot of NDL IIT Kgp.

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V. <http://103.209.90.82/video.aspx>



Fig. 2.5 Screenshot of lecture materials APP

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3. Demonstration through Laboratory

- Courses which do not have laboratory sessions, practical approach is followed by the faculty to imbibe knowledge in the course.
- Concepts will be explained in laboratories as learning by doing method. The Importance of this innovative method is student can get a deep knowledge of particular topic by observing the equipment or circuit practically.

Topic: **Explanation of CRO Working Principle in Laboratory**

Subject: **Electronic Measurements and Instrumentation**

Year& Semester: **IV – II**



Fig. 3.1 Explanation of CRO Working Principle in Laboratory

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Topic: **Explanation of RPS Working in Laboratory**

Subject: **Electronic Devices and Circuits**

Year& Semester: **II – I**



Fig. 3.2 Explanation of RPS Working Principle in Laboratory

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Topic: **Explanation Heart Respiration System**

Subject: **Bio Medical engineering**

Year& Semester: **III – II**



Fig. 3.3 Explanation of Heart Respiration System

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4. Skill Development through APSSDC

- Guest lecturers, workshops, seminars by the eminent people from Industry, Academic and Research Institutions are arranged by the State Government of AP.



Fig 4.1 Workshop Organized through APSSDC



Fig 4.2 Academic Projects Organized through APSSDC

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NRI INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
NRIIT/7.5.3/RC 11

STUDENT WORKSHOP INTIMATION

Department: ECE

Semester: I SEM

Activity: Scilab Workshop

Date: 24/9/18 to
26/9/18

| | |
|-------------------------------------|----------------------------------------------------------------------------------------|
| Name of the speaker(s) | : G. Alekhya, D. Geetha, P. Pavan Kumar, M. Ramu |
| Designation | : Trainer cum developer |
| Institution/University/Organization | : Andhra Pradesh State Skill development co-ordination/ NRI Institute of Technology |
| Title of the Workshop | : SCILAB |
| Date & Time | : 24/9/18 to 26/9/18 @ 9:20 AM to 4:20 PM |
| Venue | : UNIX LAB, NRI INSTITUTE OF TECHNOLOGY |
| Beneficiary | : II B.Tech |

Activity*: APSSDC
ECE DEPARTMENT OF NRIIT

5. Mind Map

- Mind Map is another innovative method used by faculty to improve the quality of both teaching and learning. Mind map is a way of supporting the students to make notes by using key words and images. They are much quicker to prepare and much easier to remember and review due of their visual effect.

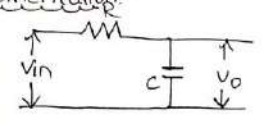
Name:- P.S.L. Atekhya
Roll no:- 15KNIA0474

TASK:- Design and Implement a voltage doubler circuit by using basic electronic components.

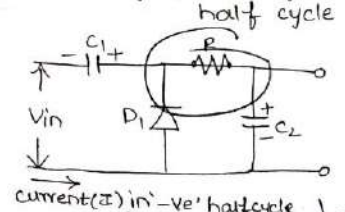
Idea:- Voltage storage elements are capacitors, so I am using capacitors for storage purpose in this task.

A Normal capacitor charges for 'V' volts

Implementation:-

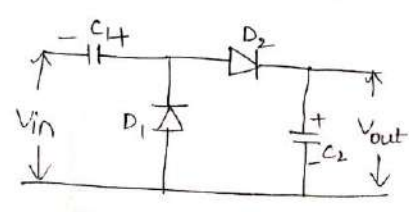


→ capacitor charging in Negative '-ve' half cycle



current (i) in '-ve' half cycle

During -ve Cycle Cap may discharge through source. Use diode to oppose discharge



Output is double of V_{in}

M. Srinil

Fig 5.1 Sample sheet of Innovative method Mind Map

Other Innovative Methods

6. Use of models as a Teaching aid

Models are human inventions, based on an incomplete understanding of how nature works. It is a representation of an idea, object, event, process and system. Models play a crucial role in science and technology teaching. In engineering it is difficult to explain some complex subjects, students may be confused and easy to forget but use of model method we can easily solve these problems. Let us see the following case. It shows how easy to understand that the difficult topic



Fig 6.1 Explanation of Microwave Component (Multi Hole Directional Coupler)



Fig 6.2 Explanation of CRO Probe, Probe tips, BNC and N connectors

7. Peer Group/ Team Teaching

One of the most visible approaches to peer learning comes out of cognitive psychology, and is applied within a "mainstream" educational framework. "Peer learning is an educational practice in which students interact with other students to attain educational goals." The peer group learning practice is popularly called as cooperative learning.



Fig 7.1 Peer Group Team Learning and Teaching

8. Project Method

This method is highly used and very popular in Electronics Engineering. It deals with the many aspects of learning together. Projects have been defined as that form of coordinated activity that is directed towards the earning of a significant skill. It involves at least four steps of active learning viz. purposing, planning, executing and judging. The project should be purposeful, useful and practically applicable to the students, with clear, well defined objectives. The level of complexity of the project should match the ability level of the students.



Fig 8.1 Explanation of Home Automation Demo Kit



Fig 8.2 Explanation of Patient Monitoring System

9. Group Discussion

Group discussion or Panel discussion is a technique used in the teaching- learning process. It is a formal discussion or verbal exchange of ideas and opinions on a specific subject with a group consisting of 5 to 8 members. In this methodology, the group members are given a topic or a situation. After reflecting on the topic for few minutes, they are asked to discuss it amongst themselves.



Fig 9.1 Group Discussion on a specific topic related to their subjects

10. Competitions

Most of the times competitions like debates and elocutions also help the students a lot in learning as the competitions keep them at the best. Also these competitions help them address large crowds which is again is a very important part of personality development. The other things which encourage active participation of students are conducting Seminar, Symposium, and Workshop, Pick and speak competition, Questioning, and Quiz contests.



Fig. 10.1 Seminar Event in a class room

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Fig. 10.2 Seminar Event in a class room