DEPERTMENT OF MASTER IN COMPUTER APLLICATION

5.6. Innovations by faculty in Teaching and Learning

Goals and Usage of Appropriate Methods:

1. All the faculty members are required to attend one FDP per Semester.
2. All the faculty members are required to complete one MOOCS certificate per Year.
3. Doctorate faculty need to publish two papers either in indexed Journals or Conferences.
4. Other faculty members have to publish one paper in indexed Journals or Conferences.
5. Non doctorates have to register for Ph.D.
6. Faculty members need to use at least one innovative teaching and Learning Methodology.
7. Students are encouraged to attempt GATE with special coaching to the interested and merit students.
8. Students are encouraged to do NPTEL courses to increase their knowledge base about the subject.
9. Virtual labs to be included for programming subjects.
10. Faculty members have to see that E-content of respective subjects is available to students.
11. Mode of teaching in this institute is not only limited to the traditional Chalk & Talk methods, but also an amalgamation of the modern teaching like power point presentation, audiovisual teaching etc.

Teaching and Learning Methodologies

1. The use of modern teaching aids like LCD projectors, Wi-Fi enabled laptops are usually employed in classrooms and other student learning environments.
2. Department encourages academic discussions between faculty and students using black board and faculty members share academic study material using Moodle, WhatsApp groups and their own blogs.
3. Department has introduced mini projects in the curriculum. Usage of Role play, Model Demo, Charts etc., during teaching learning process.
4. A team of faculty members for analytical subjects and also GATE coaching is provided to the interested and merit students.
5. Expert video subject lectures delivered by the various eminent resource persons are available in the digital library and it facilitates the faculty and students to utilize E- Tutorials of NPTEL, MOOCs & access to E-Journals etc.

6. Faculty members use department library, digital library and other Open-Source platforms to enhance their teaching skills.
7. The faculty members are encouraged to participate in short term courses, Faculty development programs and workshops on advanced topics to keep pace with the advanced level of knowledge and skills. Over the past years the faculties have been participating /presenting papers in national/international conferences and publish their articles in national/international journals to enrich their knowledge.
8. The faculty members are encouraged to use online teaching tools Microsoft Teams, Zoom, Go To Meeting, google classroom and white board Apps for giving online lectures and assignments.

Type of Innovation in Teaching & Learning Method:-

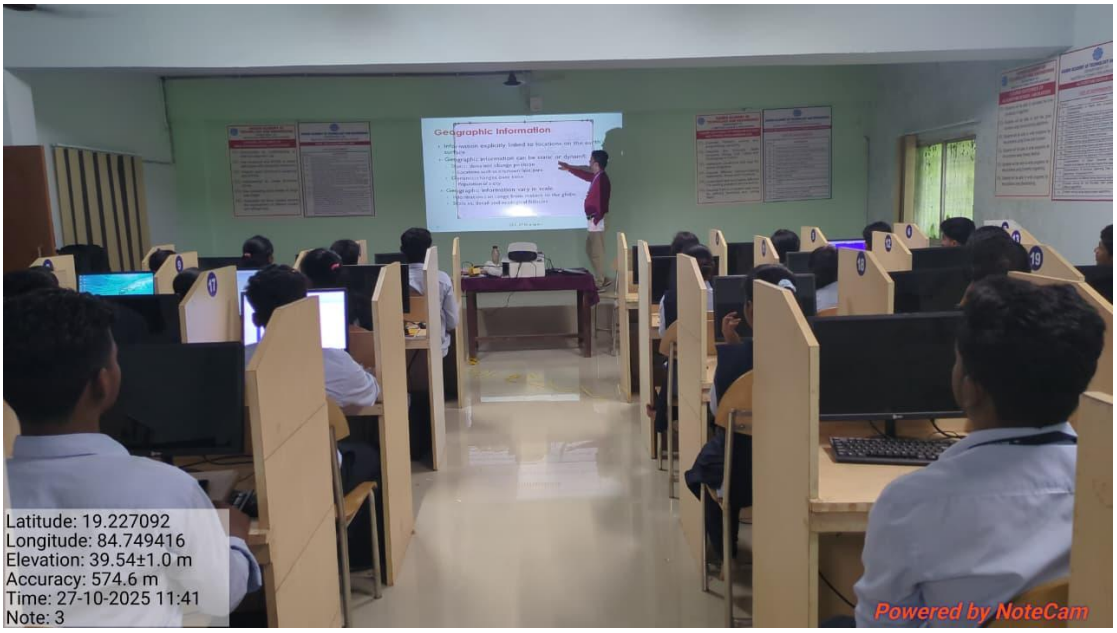
1. VIRTUAL TEACHING:

Virtual Labs:

Virtual Labs are included in the course syllabus. This practice provides a complete Learning Management System for Virtual Labs where the students can avail various tools for learning, including additional web-resources, video-lectures, animated demonstrations, and self-evaluation.

Smart Classroom:

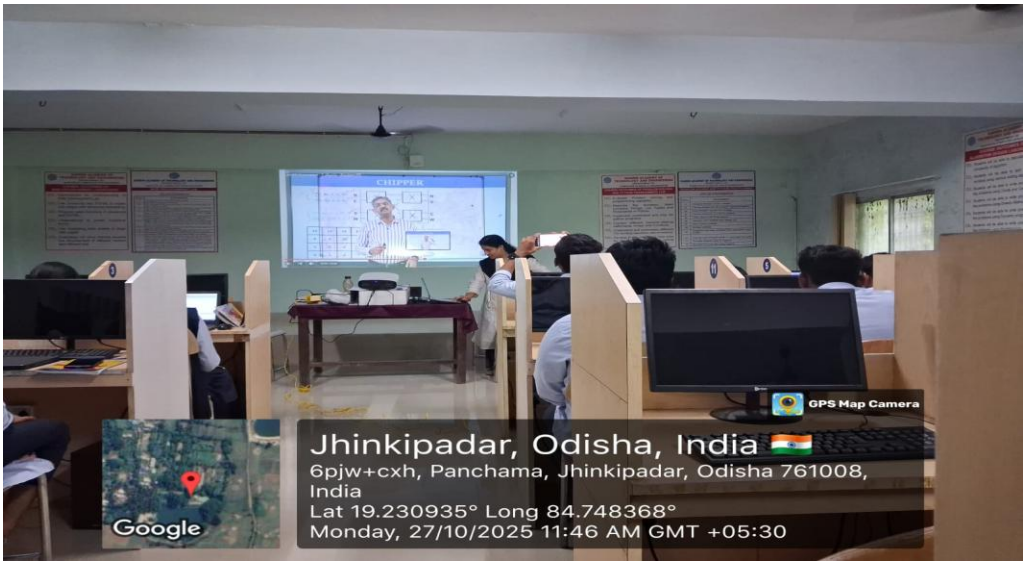
Smart classroom teaching uses digital tools like smart boards, videos, and online activities to make learning fun and interactive. Students can learn at their own pace, join group projects, and explore new ideas through technology. It helps improve understanding, creativity, and participation in every lesson.



2. INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) ENABLED TEACHING LEARNING:-

LCD projector:

Every classroom is provided with an LCD projector, computer with LAN and internet connection. The faculty member can use a blackboard / LCD projector judiciously during the lecture delivery. The faculty member can access the database of the digital library from the classroom which consists of course material, recorded video lectures, and animations.



PPT Presentation:

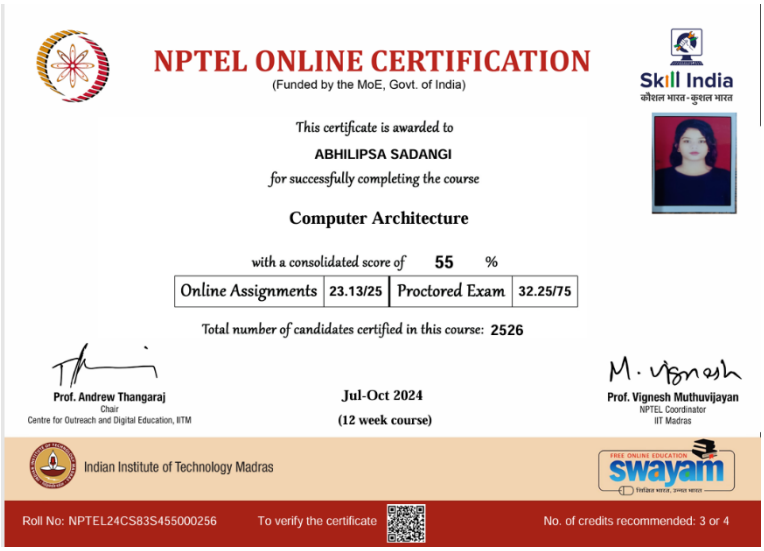
This has become a standard norm in the teaching-learning process. Power point presentations are very effective in Communication Skill Development, Improving verbal skills for effective public speaking and Sharing of Knowledge by communicating in regular interactions. Student Seminars: Seminar from the first semester onwards which is being practiced students to enhance oral expression and presentation skills. This significantly boosts students' confidence and their learning experience. Seminars are a vital part of academic programs that allow developing essential skills and understanding of the subject.

3. MASSIVE OPEN ONLINE COURSES (MOOC):-

NPTEL:

Faculty members are motivated to students to take up online courses for their subjects from various eminent platforms like NPTEL.
NPTEL: The main objective of the National Program on Technology Enhanced Learning (NPTEL) is to enhance the quality of engineering and science education in the country by developing content for undergraduate and postgraduate curricula using video and web-based courses. These courses cover the syllabi prescribed by universities and approved by AICTE. NPTEL Local Chapter: Our college is having NPTEL Local Chapter: It is a partnership between the college and NPTEL. Many students and faculty members in the department enroll for courses and get certified after the successful completion of the course.

URL:- https://nptel.ac.in/noc/E_Certificate/NPTEL24CS83S45500025604255477



4. ACTIVITY BASED TEACHING:-

Group Discussion:

To make students develop communication skills. Group discussion helps students share ideas, express opinions, and learn from others through open conversation. It improves communication, teamwork, and critical thinking skills. By discussing different viewpoints, students gain confidence, develop respect for others' thoughts, and learn to present their ideas clearly and effectively in a group setting.

5. Seminars:

To make students develop communication skills and reduce the stage fear in them. Seminars give students a platform to present topics, share knowledge, and learn through interaction and discussion. They encourage active participation, research, and critical thinking. Students enhance their communication, presentation, and analytical skills while gaining confidence in public speaking. Seminars also promote teamwork, creativity, and a deeper understanding of academic concepts through peer learning and active engagement with new ideas.

5. AUDIO-VISUAL AIDS:-

Learning By Doing:

It is a hands-on approach to learning, meaning students must interact with their environment in order to adapt and learn. Learning by doing is a practical approach where students gain knowledge through hands-on activities and real-life experiences. It encourages active participation, experimentation, and problem-solving. By performing tasks themselves, students understand concepts better, develop critical thinking and creativity, and retain information longer. This method makes learning engaging, meaningful, and connected to real-world applications, helping students build confidence and essential life skills.

6. COMPUTER NETWORKING -LABORATORY

A computer networking laboratory provides hands-on experience with network hardware, protocols, and simulations, essential for computer science students like those in Indian engineering curricula. These labs typically cover cable crimping, device configuration, IP addressing, routing, and protocol implementations using tools like Cisco Packet Tracer or NS2.

Common Experiments

-
- Study and crimp network cables (straight-through and crossover) using RJ-45 connectors.
- Examine network devices like hubs, switches, routers, and bridges.
- Connect computers in a LAN, assign IP addresses, and test with ping/traceroute.
- Implement data link layer framing (character/bit stuffing, checksum).
- Configure routing protocols (RIP, OSPF) and topologies in Packet Tracer

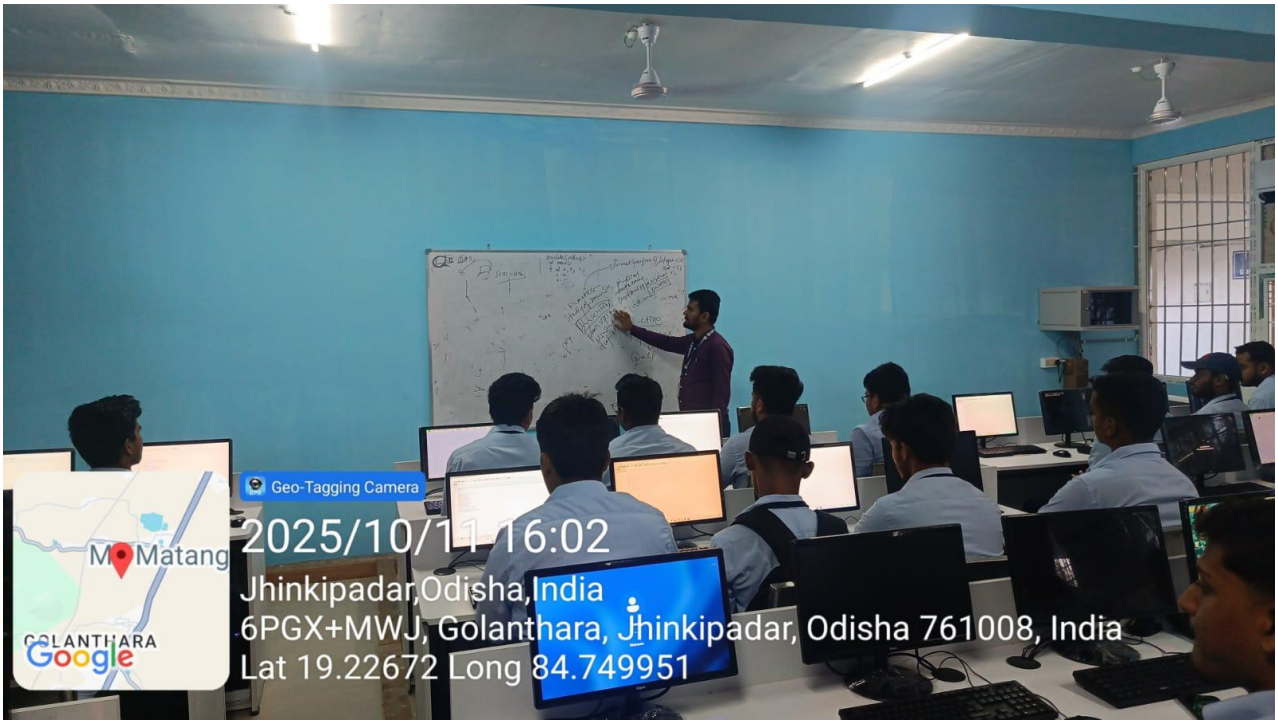
Software Tools

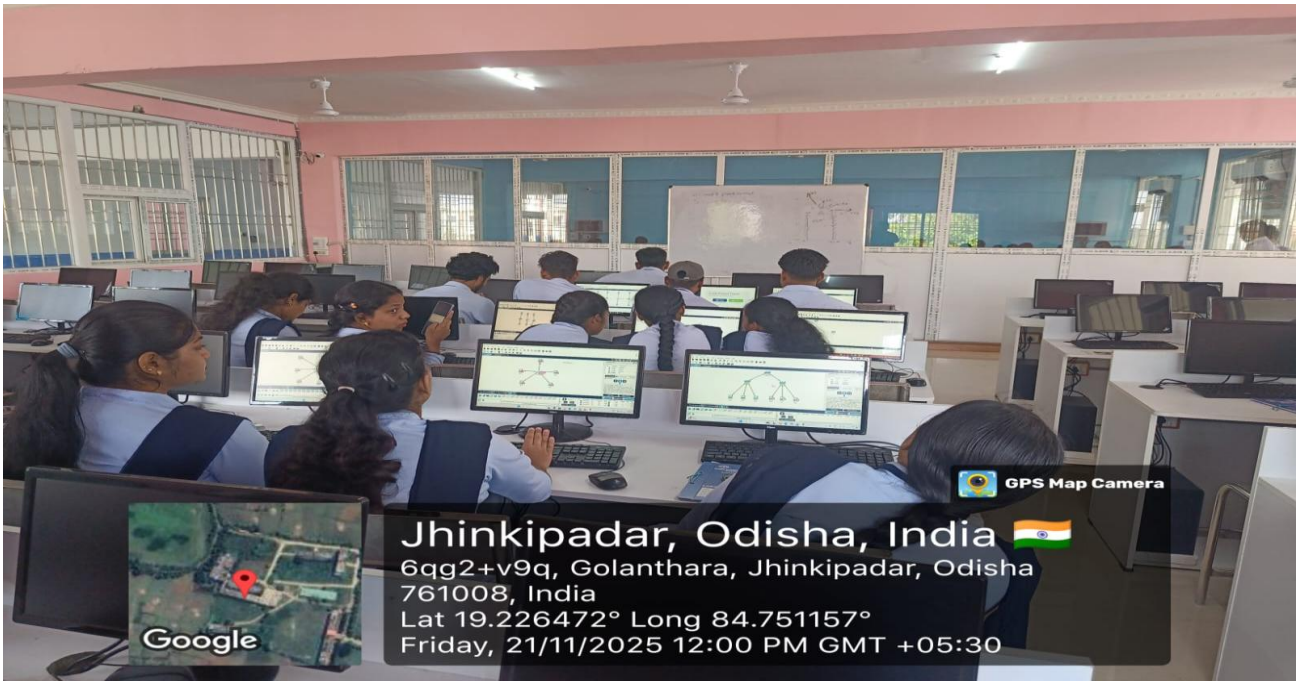
Simulation dominates due to hardware costs.

- Cisco Packet Tracer for topology design, IP schemes, NAT, DHCP.
- NS2/NS3 for congestion analysis, wireless LANs, protocol performance.
- Wireshark for packet capture and analysis (TCP handshake, UDP).
- Socket programming in C for TCP/UDP apps (echo server, chat)
-

- **Learning Objectives**

Students gain skills in protocol analysis, troubleshooting, and simulation to prepare for exams and interviews in networking roles.





LECTURE NOTES
ON

COMPILER DESIGN

Module -I

Introduction to Compiling:

1.1 INTRODUCTION OF LANGUAGE PROCESSING SYSTEM

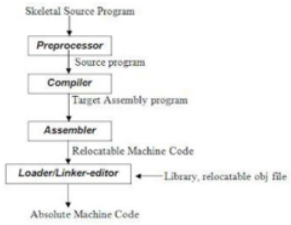


Fig 1.1: Language Processing System

Preprocessor

A preprocessor produce input to compilers. They may perform the following functions.

1. *Macro processing:* A preprocessor may allow a user to define macros that are short hands for longer constructs.
2. *File inclusion:* A preprocessor may include header files into the program text.
3. *Rational preprocessor:* these preprocessors augment older languages with more modern flow-of-control and data structuring facilities.
4. *Language Extensions:* These preprocessor attempts to add capabilities to the language by certain amounts to build-in macro

COMPILER

Compiler is a translator program that translates a program written in (HLL) the source program and translate it into an equivalent program in (MLL) the target program. As an important part of a compiler is error showing to the programmer.

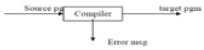


Fig 1.2: Structure of Compiler

Youtube Videos:

The video lectures of specific topics in selected courses were prepared by the course faculty and had the same content as the classroom lectures. Video lectures give students control of the lecture and are portable. Students can replay segments and stop the lecture as they study to understand the content. They can skip segments of topics they know. In effect, they can adjust the instructors delivery speed and topic selection to match their learning pace, especially beneficial to the weak students.

Content Delivery by Video Lectures: Study materials related to any subject of MCA department Course has made available for students. It helps as a remedial material for the absentees and helps those who have any doubt.

SL.NO.	SUBJECT	TOPIC	Link
1	DIGITAL LOGIC DESIGN	CANONICAL & STANDARD FORMS	https://youtu.be/zmtoUDJrQ8s?si=XKFtK1q0G54IFARe
2	COMPILER DESIGN	INTRODUCTION TO COMPILER DESIGN	https://youtu.be/RrpTan1peGY?si=lrZQvABk2wkcKdrz
4	DBMS	Basics of DBMS, Advantages of DBMS 3--Schema Architecture	https://youtu.be/vhDbOUEgQ6U
5	DS	Introduction to Linked list & Types	https://youtu.be/Ucb4FspK_YA?si=wS7-pch0P6XkKRVu
6	IOT	Introduction to IOT	https://youtu.be/bNMCaebOsHw?si=5JFkeR-pfZNC-FaE
7	DBMS	Normalisation	https://youtu.be/i8_v56qCLKc
8	JAVA	Array	https://youtu.be/842fhTZ91gk
9	DS	AVL Tree	https://youtu.be/Oa8oAYRC324?si=6YiOS738LsAou1RZ