2.3.1 - Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences

Additional Information

The Institute makes continuous and conscious efforts to enable its students to realize their potential and evolve as leaders and transforming agents of society. The basic focus of the institute is Student Centric Approach, for which the institute is gradually adopting the Outcome Based Education (OBE) framework along with Choice based Credit System (CBCS) which is in-line with the vision of the parent university. The curriculum of each programme ensures that students receive a sound theoretical foundation as well as excellent hands-on learning with the development of analytical and problem solving and design thinking skills. Some of the prominent features could be illustrated as below: Programmes offered have scope for interdisciplinary learning and research which can be seen in areas like (but not limited to) Robotics, IoT, AI, Big Data Analytics, Information Security, Cyber Security etc. There is a clear interaction across disciplines through not only project-based learning approaches in certain courses but also in the form of Programme Electives, Open Electives/ Other Electives. Pedagogy includes a fair bit of innovation such as the use of flipped classroom model, MOOCs with proctored exams, project-based courses with simultaneous emphasis on theory and practice, group projects and presentations for fostering peer-learning, research seminars, team building and interpersonal communication, use of LMS and communication platforms.

Through the joint efforts of teachers and students, innovative teaching practices are implemented as a continuous learning process. The university's regulations and curriculum structure are designed to support the learning experience. Experiential learning, participatory learning and problem solving methods have been integrated in the entire teaching process The Institute adopts a student-centric teaching and learning approach. Teachers conduct internal evaluations based on problem-solving methods/case studies/creative assignments, etc. The curriculum structure of various programs also provides a series of practical subjects and a series of elective subjects for students to choose from their fields of interest. These elective courses enable students to develop professional knowledge in their areas of interest. These elective courses are designed according to industry development and requirements. These courses prepare students to adapt to the real world and become more employable.

In addition, most of the departments provide major/minor projects in the form of academic research projects/industry-oriented projects/dissertations, which are mandatory requirements for the curriculum. This enhances experiential learning and provides students with practical opportunities. In addition to lectures and tutoring, students also participate in group discussions, group projects, individual projects, internships, field work, etc. All these activities are aimed at experiential learning, participatory learning and collaborative learning in an efficient manner. Industrial interaction is in the form of well-known speakers from industry, academic/research organizations and other fields. Industry visits, entrepreneur development programs, etc. are regular functions of most programs provided by the Institute.

In order to impart innovative educational practices, the primary focus of the Institute is to regularly improve teaching methods. This is done through a strong training culture, the establishment of

knowledge inquiry capabilities, and a challenging platform for students to develop innovative methods of learning and practice. The Institute uses a variety of technologies to ensure student-centred learning, thereby increasing student participation and motivation: In teaching pedagogy various activities like Group Discussions , Role Plays , Projects , Internships , Industrial Visits , Group Learning, Case Studies , Presentations , Field Visits , workshops , seminars , personal counselling etc. are used for enhancing learning experiences.

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NAAC ACCREDITED GRADE "A" INSTITUTE
Approved by AICTC, Ministry of HRD, Govt. of India, Affiliated to GGSIP University
Recognized Under Sec. 2(f) of UGC Act 1956
INSTITUTIONAL AREA MADHUBAN CHOWK,ROHINI,DELHI 110085
Tel:91-11-27555121-24, E-Mail : directortias@tecnia.in, Website: www.tiaspg.tecnia.in

Department of Information, Communication & Technology

Course Name: Computer Networks

Academic Session: 2021-22

Experiential Learning Activity:

Role Play on Star Topology

This role-play consists of 5 students. Student 1, student 2, student 3 and student 4 act as device 1, device 2, device 3 and device 4 respectively. Each of these devices are connected to the hub of the star topology. Student 5 plays the role of the hub. Two scenarios have to be depicted:

1. Normal working of the star topology: Device 2 has to send data to device 4. Device 2 send data to the hub and then the hub through the hub
2. Hub as a single point-of-failure: Communication halts among devices

Role Play on Ring Topology

This role-play consists of 5 students. Student 1, student 2, student 3, student 4 and student 5 act as device 1, device 2, device 3, device 4 and device 5 respectively. Each of these devices are connected to each other in a ring topology. Two scenarios have to be depicted:

1. Normal working of the ring topology: Device 1 has to send data to device 5. Although device 1 is directly connected to device 5, but since the direction of communication is from device 1 -> device 2 -> device 3 -> device 4 -> device 5, the data sent by device 1 will cross all the other devices to reach device 5.
2. Failure of device 3: Communication cannot happen between device 1 and device 5

Learning Outcomes: Student will be able to

1. Understand the working of Ring and Star topologies.
2. Analyze the advantages and disadvantages of Ring and Star topologies.

Problem-Solving Techniques:

Numerical 1:

Consider an optical fibre network where data needs to be carried along a distance of 2.1 km. The speed of data transfer in an optical fibre is 70% of the speed of light. Calculate the propagation delay for this network.

Learning Outcomes: Student will be able to

1. Understand the relation between speed, distance and propagation delay.
2. Calculate the value of propagation delay.

Numerical 2:

The bandwidth of a noisy channel is 4 KHz and the Signal-to-Noise Ratio is 100. Calculate the maximum bit rate using Shannon Capacity.

Learning Outcomes: Student will be able to

1. Understand the relation between bandwidth, Signal-to-Noise Ratio and Capacity of a channel.
2. Calculate the maximum bit rate of a channel using Shannon Capacity.

Participative Learning:

Group Discussion:

Compare and contrast the features of:

1. Frequency Division Multiplexing, Wavelength Division Multiplexing and Time Division Multiplexing
2. Circuit Switching, Packet Switching and Message Switching

Learning Outcome: Student will be able to analyze the characteristics of various multiplexing and switching techniques.