Innovations by the Faculty in Teaching and Learning(20)

OUTCOME BASED EDUCATION (OBE) is a teaching and learning approach that focuses on the outcomes or goals that students are expected to achieve rather than the traditional approach of focusing on the input such as lectures and materials provided by the teacher. It is a teaching and learning approach that focuses on graduate attributes and result-oriented thinking instead of traditional input-based education. In OBE, desired outcomes are determined so that the program curriculum and teaching-learning approach, along with the required facilities, can be designed in a top-down manner

OBE is an approach to measure the outcome of learners that focuses on identifying and measuring the knowledge, skills, and attitudes that students should acquire as a result of their education. The learning goals and objectives are clearly defined and communicated to students, teachers, and parents. These goals and objectives are often referred to as "learning outcomes," and they serve as the basis for planning, teaching, and assessing student learning.

By focusing on specific outcomes, teachers can better align their instruction with the goals of the curriculum, and students can understand what is expected of them and can work towards achieving those expectations.

One of the key benefits of an OBE approach is that it promotes student-centred learning. Rather than simply delivering information to students, teachers in an OBE system encourage students to take an active role in their learning.

Students are encouraged to ask questions, explore, and discover new things on their own, and teachers provide guidance and support as needed. This approach helps students to develop critical thinking skills, problem-solving skills, and the ability to learn independently, which are valuable in today's world.

Another benefit of an OBE system is that it allows for more flexibility and adaptability in the classroom. Because the focus is on student learning rather than teaching methods, teachers can use a variety of instructional strategies and approaches to meet the needs of their students.

This can include traditional lecture-based instruction, hands-on activities, collaborative learning, and other methods. This flexibility allows teachers to tailor their instruction to the unique needs and abilities of their students, which can help to ensure that all students can learn and succeed.

Overall, the emphasis on student learning in outcome-based education is a positive development in the field of education. Student learning and achievements can be viewed at the macro level. This leads to the self-directed learning of students, as they know what they are trying to achieve, and more responsibility is owned by the students. Outcome-based education thus encourages a student-centred approach to learning and teaching.

OBE is based on decision-making and actions. The complete focus of the system is on purposes, learning, results, and accomplishments

Data-driven decision-making is an important approach to improving student learning. This approach involves using data and evidence to improve educational decisions and to ensure that students are getting the best possible education for the following:

- Continual improvement.
- Industry ready.
- Gap identification in the teaching-learning process.
- Improving assessment planning & implementation.

For all the achievement of all the above following innovative practices are adopted at this institute:

(A) Inclusive Classroom

(i) In our classrooms the students of every ability level receive teaching in the sameplace**.** This means that particularly able students learn alongside those who have special educational needs, or the ones with other attention elicit disorders.

(ii) Beside the special need students, we have a full spectrum of socially diverse mix of students. Some come with very weak education base, some from non-English medium schools, some with economically very poor background or some from remoteparts of India.

Personal Touch

(i) There is great emphasis on the personal touch of faculty with each and every student of the class. The faculty is well aware that the present time students have all kinds of distractions to digress from the main course studies. A constant personal vigil and the consequent corrective actions are therefore viewed as an in escapable requirement of the present day college environment. This is accomplished through the Course Coordinators for each class who are like their guardians in the campus.

(ii) The students have total freedom to approach the faculty. The latter can be reached in classroom, faculty chamber or even at home through phone or email. The reverse isalso practiced by the faculty who take this as their duty to interact with their students any where any time should the need be there.

(iii) The students have similar freedom, as a matter of work culture, to access theirHODs, Associate Directors or Director for any reason – personal or official, at any time, any where in the hour of need.

(iv) Great emphasis is laid on the attendance in the first period. The students arequestioned in case of frequent absence. As a policy, they are permitted to attend the class but not marked present,if late.

(v) Minor offences like not being in proper uniform or not being attentive in the classes are not ignored. The idea is to inculcate seriousness in day-to-day life and the rest is believed to fall in place automatically.

(B) Instruction Delivery: Following points are taken in to account for the delivery of lessons-

Decision on the delivery method: This is the critical first step. Taking in to consideration as to what all is going to be taught, following points are considered by the faculty–

- What should be taught to the whole group in a conventional teacher-led lesson?
- What should be covered using cooperative learning?
- Is a lesson best suited for small group instruction? If yes it could be taken up in smaller batches or may be repeated in tutorial classes.

- **Launch of lesson.** A plan is kept in mind as to how the lesson is going to be launched with the flexibility of change as per the need. In order to ensure attention of the students into the lesson, some technology integration like showing a video clip isused to set the stage.
- **Clear directions on expectations from the lesson**: After making sure that all ears are tuned to the lesson the expectations for the lesson are stated. These are checked back from some students as to what is expected from them.
- **Random checks to ensure attention**. As the class proceeds, random questioning is done to ascertain attention in the class. When the students know that any one of them could be asked, they tend to remain alert.
- **The pace of teaching**: The tempo of the class is kept at a pace that best meets the needs of the students. If found to be confused, the pace is slowed. If they are getting restless, the pace is fastened a bit.
- **The variety and enthusiasm:** The variety is the spice to life. Efforts are made tobreak the monotony of the class by adding humor or other means. Most importantly, the teachers ensure to exhibit great enthusiasm about their instructions.

(C) Methods of Instruction: The biggest challenge for any teacher is capturing each students attention, and conveying ideas effectively enough to create a lasting impression. As a teacher, to tackle this challenge effectively, the faculty practices many innovative ideas that make the classroom experience much more lovable for the students. These teaching methods broadly fall under three categories which are briefly touched upon as under-

- **Differentiated Instruction (Low Tech)Method**: It is the teaching practice of tailoring instructions to meet the individual students' needs in a classroom. Some of the approaches followed are given below-

- **Stimulating Classroom Environment:** A classroom environment that iswell-kept, airy and well lit helps stimulate a student' mind and helps him think and learn better. An environment that positively impacts the students is beneficial for the instructor as well.

- **Introduce the Lesson**: In order to make the learning sessions more interesting some creative ways are practiced before introducing the subject. A popular way is to recapitulate what was done in the previous session and spend some time in introducing the ensuing topic.

- **Real-World Learning:** Infusing real-world experiences in to the instructions makes teaching moments fresh, and enrich classroom learning. Efforts are made to relate and demonstrate the lesson with the real-life situations to make the material easy to understand and easy to learn.

- **Classes Outside the Classroom:** Some lessons are best learnt, when they are taught outside of the classroom. With this in mind the students are taken for industrial visits where students get industry exposure, and get to see the technology employed on ground in real terms.

- **Puzzles and Games**: Learning is fun when puzzles and games are part of education. Students may not require any conscious effort when their lessons are introduced through Puzzles. We therefore regularly hold surprise tests in the form of cross word puzzles.

- **Model Based Learning**: Where ever possible, old projects, models or posters etc. are used as teaching aids. The students are able to connect well with the subject as something working is in front of them.

- **Inquiry-based Learning (High Tech):** Inquiry-based learning is a teaching method that casts a teacher as a supportive figure who provides

guidance and support. This is basically collaborating learning and implies following–

- **Student Presentations:** Discussions on presentations.
- **Tutorial Classes**: These are regularly held as a doubt clearing session for the students. The classes are half the size of regular batch for more intimate interaction.
- **Brainstorming Sessions:** The secessions are frequently held in the classrooms to get the creative juices flowing. When the multiple brains focus on one single idea, one is sure to get numerous ideas and will also involve every one into the discussion. These sessions are a great platform for students to voice their thoughts without having to worry about right or wrong.
- **Students Projects:** Students do small own time projects like those for technical festivals or competitive events etc. Faculty encourages students to deal with real world problems and work on socially relevant projects. Mini projects are also given to students of second and third year to motivate them for group learning and having hands-on experience.

(D) Professional Bodies

The importance of active association with the professional bodies like IEEE and their likes are impressed upon the engineers in making. They are encouraged to become member of such bodies,

and are made to participate in their deliberations in local chapters for the firsthand exposure. Many

Faculties and students in the department are members of such professional Societies

as already mentioned:

S. No.	Name of Faculty	Professional Body	Membership Type	Membership No.
1	Dr Umesh Kumar Pandey	The Indian Science Congress Association	Lifetime	L18302
		Computer Society of India	Lifetime	2010000372
		Institute of Doctors Engineers and Scientists	Lifetime	5029
		International Association of Computer Science and Information	Lifetime	80341827

		Technology (IACSIT)		
		International Association of Engineers	Lifetime	113456
2	Mr. Abhishek Malviya	IEEE	3 years	98448870
3	Dr. Amit Kr. Tiwari	IEEE	3 years	90932008
		The Indian Society for Technical Education	Lifetime	LM64239
		CSI	Faculty	F8004250

(E) Research Publication

- Students and faculty members have been participating/presenting papers in National/International Conferences and publishing their articles in National/International Journals to enrich their knowledge.
- Faculty members have uploaded their research papers on Google Scholar /Research Gate which provides them public access. This also helps the students to get motivated to involve themselves in research too.
- Sometimes faculty members take students to laboratories for demonstration of experiments before the class so that same topic can be easily understood in theory class.
- **Expeditionary Learning (High Tech)**. The learning in this model includes multiple content areas so that students can see how problem-solving can happen in the real world. The examples of this in our case are given below–
  - **Software Tools**: Faculty members use and demonstrate the use of digital library, MATLAB, P-Spice, Network Simulator tool, TINA and other open source tools to familiarize the students with the utility of these tools.
  - **Use of ICT**. Extensive use of audio-visual aids is made to supplement the text books during classroom sessions. These can be models, videos, charts/posters or other mind mapping tools. Such tools help the students‟ imagination thrive and grow. These methods not only develop their ability to listen but also help them understand the concepts better. ICT is therefore viewed as the most potent tool in the hands of the faculty to make the teaching learning most meaningful. Some of its applications are outlined below-

Faculty motivates students to go for ICT supported learning (MOOCs, e- learning, SWAYAM videos etc.).

- To facilitate better understanding of students, faculty shares topic wise NPTEL and other related content videos with them. This provides the man easy access and broad exposure to the detailed subject material for after the class study.
- Use of modern teaching aids like LCD projectors, internet enabled computer systems, smart boards etc. are employed in classrooms
- **Creative Teaching:** Faculty takes the help of various tools to stimulate creativity. The emphasis is on the visuals that excite young minds and capture their interest. They encourage different ideas of the students and give them the freedom to explore.

- Assigning **Miracle Group** (Specialized for subject) for practical subject Conducting
- **PSD (Programming Skill Development)** Classes by different Specialized trainer.
- Use of **Kahoot** Quiz platform to encourage group learning.
- Use of **Quizizz** Quiz platform to encourage group learning.
- Use of **Hacker Rank** platform to encourage group learning.
- Use of **ICT (Information & communication technology)** to encourage group learning.
- Assigning **minor projects** to encourage learning beyond curriculum.
- **Group discussion** to help in analysis and synthesis.
- **Seminar/Webinar** to improve communication and awareness towards new topics.
- **Home assignments** to encourage learning beyond working hours.
- **Conducting technical fest** to enhance intra-group competitiveness and inter group learning.
- **Conducting cultural fest** to enhance extra-curricular and social aspects of life.
- **Video Lectures** to improve learning beyond working hours.
- **Forming various groups** of senior and junior students (third year-second year, fourth year – third year students) for having regular technical discussions on various topics **Using Virtual labs** for demonstrating the working of basic programs in python so that students can easily understand the basic logic of fundamental programs
- **Organizing Coding based various competitive events** for second year, third year students on regular basis to groom the coding skills among them
- **Organizing project based competitive events** for final year students
- **Organizing in house summer trainings** on various basic and advanced topics to enhance the coding skill of students in different languages and encouraging them to implement their concepts in various projects
- **Using MOODLES and Microsoft Forms for organizing** online MCQ baaed Quiz on various topics for the students. The shorter versions of these quizzes are regularly being used in classes for making the class interesting and increasing attentiveness of students in the class
- **Organizing Expert lectures** from the eminent professors/ experts from various institutions including MNNIT and IIIT and other distinguished institutions

(F) Seminars/Expert Talks/FDP.

- The faculty members are encouraged to participate in short term courses, webinar, faculty development programs and workshops to keep their knowledge base current and abreast with the times as mentioned:

S. No.	Name of Faculty	Type of Activities	Place
1	Dr. Umesh Kr. Pandey	Conference Committee Member/Organizers	• Technical Program committee member and reviewer in the congress on Smart Computing Technologies (CSCR 2023) held during December 02-03 2023 • Program committee member and reviewer in the 3rd international conference on intelligent vision and computing (ICIVC 2023) held during November 25-26 2023 • Technical Committee Member of National Conference on "Futuristic Development of Computing Technologies in Education of India: Vision 2023 • General chair of an "International conference on Applied Sciences, Engineering and Technology" Organized at United Institute of Technology Naini Prayagraj held on 15 & 16 July 2022 • Program Coordinator of one-week faculty development program titled "Teaching Methodologies for Contemporary Engineering Education" Held at United Institute of technology Naini Prayagraj held in April 2022 • Reviewer, for International conference on "Power Electronics &IoT Applications in Renewable Energy and its Control (PARC-2022), GLA University Mathura India, held in Jan 2022 • Participated in :The Ninth International Conferencce on Big data Analytics (BDA 2021) Organized by Indian Institute of Technology Allahabad during 15-18 December 2021 • Technical Program Committee member in IEEE International Conference on Technology, Research & Innovation for Betterment of Society (TRIBES-2021) held at Indian Institute of Information Technology Naya Raipur Chhattisgarh India during 17-19 December 2021. • Committee member of "The 2018 International Conference on Education Science and Human Development (ESHD2018)" Held in GuiLin, China, 19-21, October, 2018. • Organizing Committee member of International Seminar on "IT Innovations And Security Issues" Organized by MATS School of Information Technology, MATS University Raipur Chhattisgarh held on 29th-30th December 2016 • Organizing Committee member of Corporate Summit on "IT Uddhyamita 2016" organized by MATS School of Information Technology, MATS

			University Raipur Chhattisgarh held on 30 July 2016
		Awards & Appraisals	• Indo - Thai Academic Awards-2019 for Distinguished Professor; Award venue KU Home, Kasetsart University, Chatuchak, Bangkok, Thailand By International Association of Research and Developed Organization • Green ThinkerZ Outstanding Educator Award 2017. • Chairman Computer Society of India Raipur Local Chapter 2018-19 Editorial Board Membership • Executive Editor of Advanced Scientific Research: Web-link (http://www.advancedscientificresearch.in/drumeshkrpandey.php) • International Journal of Computers & Technology • International Journal of Intelligent Information System • Education Journal
		External Paper Setter/Reviewer/External Examiner	UPRTOU Prayagraj VBSPU Jaunpur MATS University Kalinga University Raipur United University Prayagraj RMLAU Ayodhya
2	Dr. Amit Kumar Tiwari	External Practical Examiner	AKTU Practical Examiner
		International Conference on Applied Sciences, Engineering and Technology (ASET2022)	UIT, Prayagraj
3	Mr. Prafull Pandey	External Paper Setter/Reviewer/Practical	AKTU Lucknow, United University, Prayagraj
4	Mr. Rohit Mishra	External Paper Setter/Reviewer/Practical	AKTU Lucknow, United University, Prayagraj
5	Mr. Anil Singh	Mr. Dhananjay Kumar Sharma	AKTU Lucknow, United University, Prayagraj
6	Mr. Dhananjay Kumar Sharma	External Paper Setter/Reviewer/Practical	AKTU Lucknow, United University, Prayagraj

- The college encourages our faculty to accept offers from the outside agencies like academic institutes, industries and the government bodies to contribute their services liberally as subject experts. This is promoted not only as our academic obligation but isalso done to broaden their intellectual horizon and to get a larger perspective in their domain of work. Such learning outcomes and experiences give them a very definite fillip to become a much better instructor to the definite advantage of our students.

(b) Mock Technical Interviews.

(i) The Placement is a subject of great anxiety for all the students. The Placement Cell of the college understands this well, and therefore starts the preparations for this from the First Year itself.

(ii) The responsibility for this activity rests with the faculty of Student Development Programme (SDP) - a unique initiative of the college. The idea is to prepare the students in following areas – Soft skills, technical skills and some level of proficiency in coding and to let them industry ready.

(iii) Experts from the SDP take care of soft skills and aptitude training while the technical subject specific skills and the technical coding are provided by the department experts.

(iv) Campus Recruitment Training Program takes a very professional approach to prepare and grill the aspirants to face the challenge squarely. A tailor made crash course based on the thrust areas of the employer is planned and run for the ensuing visit of the employer. This embodies following subjects –

- ✓ CV Building
- ✓ Quantitative Aptitude
- ✓ Case studies
- ✓ Technical sessions
- ✓ Interview Preparation

It is the in genuity and the dedication of complete team which helps our students to succeed in such competitive times.

Assessments for Evaluation. Every lesson we deliver has something we want our students to "get." To find if they "got" it, questions are asked and all the students are encouraged to respond by raising hand. It is a clear reflection of the effectiveness of the delivery of the instruction. What worked? What didn't? This is analyzed by the instructor, and based on this a call is taken to repeat the lesson to refresh the topic. Answers are also searched for if there was a need to re-teach this lesson, what would be retained or what would be changed? Self-reflection is a vital step in helping the instructor to become a better teacher.