



SCIENT INSTITUTE OF TECHNOLOGY

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7.2 BEST PRACTICE-1

“LEARNER-CENTRIC “PEDAGOGY TO ACHIEVE GRADUATE ATTRIBUTES”

1). Information and Communication Technology (ICT) in Teaching and Learning Process:

In recent times, life has become easier, due to the invention of ICT. In the last few decades, there has been a tremendous growth in the use of ICT in all fields such as education, facilities, industries, businesses, societies, lives of people. SCIENT INSTITUTE OF TECHNOLOGY integrating ICT with the teaching and learning process in order to provide knowledge and skills to the learners to meet the challenges of educational environment. With the integration of ICT in education that one can teach students to be participants in the growth process in this era of rapid change. ICT having revolutionized the way people work today and are now transforming educational systems. During the last three decades, the changes in educational environment have been phenomenal. The model, focus, role of the learner and technology has been changed drastically from traditional instruction to virtual learning environment

Changes in Teaching and Learning Environment

Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. This new environment also involves a change in roles of both teachers and learners. The role of the teachers will change from knowledge transmitter to that of facilitator, knowledge navigator and sometime as co-learner. The new role of teachers demands a new way of thinking and understanding of the new vision of learning process. Learners will have more responsibilities of their own learning as they seek out, find, synthesize, and share their knowledge with others. ICT provides powerful tools to support the shift from teacher centered to learner centered paradigm and new roles of teacher, learner, curricula and new media. Learners are expected to collect, select, analyze, organize, extend, transform and present knowledge using ICT in authentic and active learning paradigm. Teachers are expected to create a new flexible and open learning environment with interactive, experimental and multimedia based delivery system. ICT helps teachers and learners to communicate and collaborate without boundaries, make learners autonomous and allow teachers to bring the whole world into classroom activities, especially the concept of on-line programmes. It is ultimately important to understand the roles of ICT in promoting educational changes. A basic principle is that the use of ICT changes the distribution and ownership of information resources in the space of



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teaching and learning and thus changes the relationship among educational participants

Components of ICT for Teaching and Learning

- a) **E-Classrooms:** Using LCD projector one teach in a easy method and one can learn in a easy way .our Scient Institute had LCD projectors in class rooms
- b) **World Wide Web:** The World Wide Web is one of the several internet resources developed to help, publish, organize and provide access to information on the Internet.

Scient Institute had internet connection with high speed broadband connection

- c) **Social Media:** Social media are perhaps the most promising and embracing technology. Some most commonly used social media are MySpace. Facebook, Delicious and Flickr, watsapp, Instagram, twitter etc. Scient Institute had Facebook, Instagram accounts and also class wise , dept wise students watsapp groups.



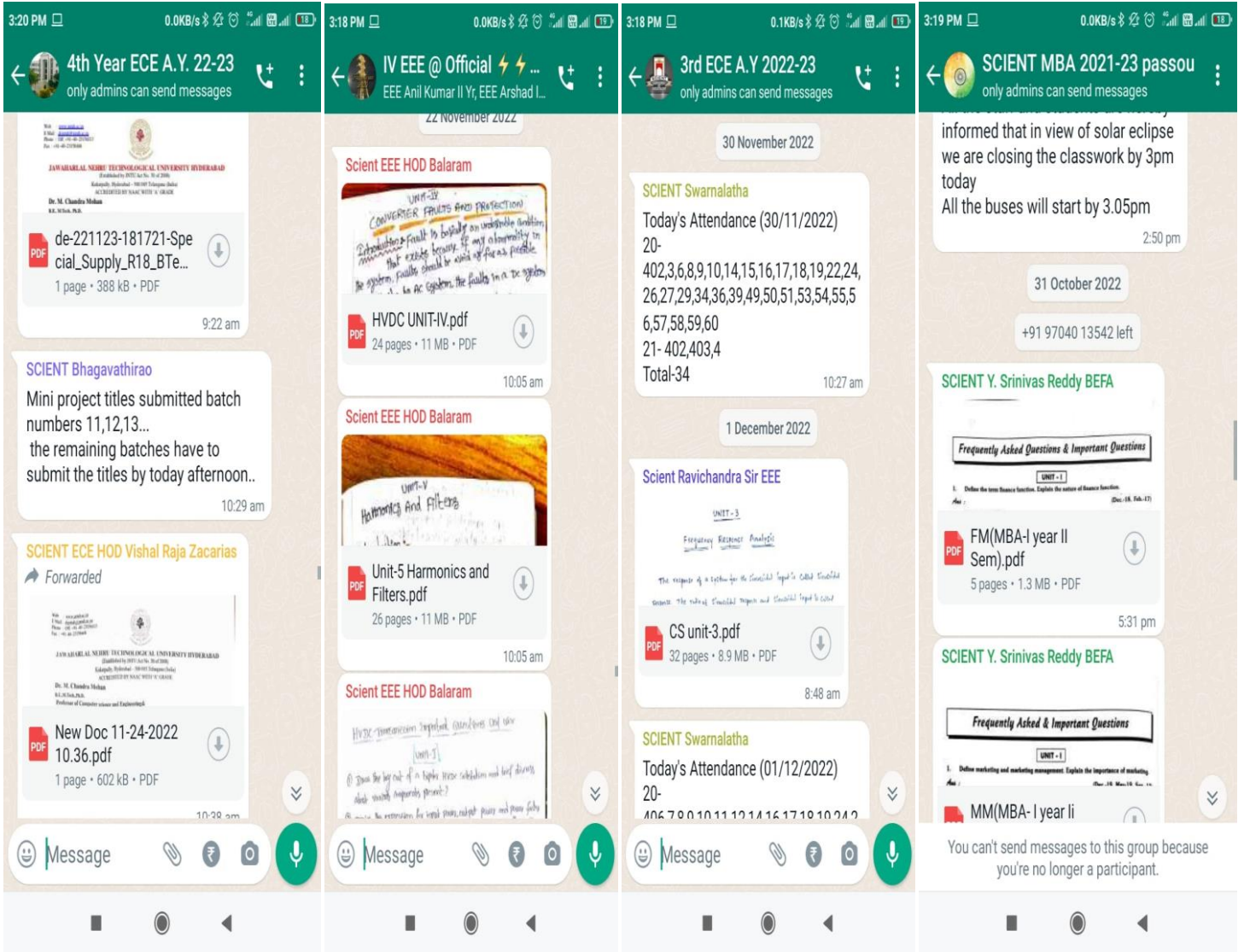
E- CLASSROOM TEACHING



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Class wise ,section wise whatsapp groups in all departments.



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42 Tweets

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EAMCET CODE: SNTI EAMCET CODE: SCTP

100% Placements

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Hyderabad, India scient.ac.in Joined July 2021

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Tweets Tweets & replies Media Likes


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Instagram

scientisnti Edit profile

101 posts 289 followers 64 following

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Dept of Computer Science & Engineering
organizes
A 5 day workshop on
PROGRAMMING ESSENTIALS IN PYTHON & DJANGO
in collaboration with
Nov 21 - 25, 2022
VENUE: C-203

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A three day workshop on
Century Transferable
in collaboration with
TASK
Nov 17th - 19th, 2022


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IN 12/17/2022

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2) Learning by Doing:

Learning by Doing is a guide to teaching and learning methods. Learning by Doing is method ,where a student carries out physical activities rather than listening to a lecture, is the most popular type of **learning** with students - '**doing**' helps them to gain a better understanding of the material .SCIENT INSTITUTE OF TECHNOLOGY provides best facilities to our student to practice the subject in advanced laboratories.



PRACTICE IN LABS




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3). Think-Pair-Share:

Think-pair-share (TPS) is a collaborative learning strategy where students work together to solve a problem or answer a question about an assigned reading. This strategy requires students to

(a) Think individually about a topic or answer to a question


(b) Share ideas with classmates.

The **Think-Pair-Share** strategy is designed to differentiate instruction by providing students time and structure for thinking on a given topic, enabling them to formulate individual ideas and share these ideas with a peer.



SHARING KNOWLEDGE SHARING AMONG THE STUDENTS (Think-Pair-Share)




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SHARING KNOWLEDGE SHARING AMONG THE STUDENTS (Think-Pair-Share)


4) Process Oriented Guided Inquiry Learning (POGIL):

There are two crucial aspects to the design of a POGIL activity. First, sufficient appropriate information must be provided for the initial "Exploration" so that students are able to develop the desired concepts. Second, the guiding questions must be sequenced in a carefully constructed manner so that not only do students reach the appropriate conclusion, but at the same time various process and learning skills are implemented and developed.

Typically the first few questions build on students' prior knowledge and direct attention to the information provided by the model. This is followed by questions designed to help promote the recognitions of relationships and patterns in the data, leading toward some concept development. The final questions may involve applying the concepts to new situations and generalizing students' new knowledge and understanding. Thus, POGIL activities follow the structure of the learning cycle of exploration, concept invention and application, and have a strong basis in constructivism.

In contrast to traditional classrooms, students in a POGIL classroom work in small groups (of 3 or 4) on a specially designed activity. Each student is assigned a role, such as manager, recorder, spokesperson or reflector. The instructor serves as a facilitator who listens to the discussion and intervenes at appropriate times to guide student learning. In groups, students discuss the answers to carefully crafted questions that lead them to consider the general ideas in question and to construct their own understanding of important course concepts. As ideas are formulated, groups share their findings and understanding to new and increasingly difficult problems or contexts.




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Rather than having the instructor begin class by defining terms and laying out concepts, students work actively to master material and formulate a deeper understanding of content. Built into the experience is the support of a variety of important process skills, including communication, teamwork, and critical thinking, which translates to a more complete understanding of the entire concept, and a lasting understanding.



POGIL PRACTICE




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POGIL PRACTICE




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1. POGIL TASK ON - SORTING

Department of CSE
II/IV B.Tech I Semester

INDEX

Contents	Page No
Faculty Information ,Learning Objectives , Preparation Activity Notes, Things to Do, Activity History	

Faculty Information:

Anoosha, Assistant Professor, SNTI, Hyderabad.

Learning Objectives

After completing this activity, learners should be able to:

- Understand and visualize that there will be numerous algorithms/programs for a problem
- Understand and identify different strategies of sorting.
- Able to evaluate/ calculate the complexities of the algorithms.
- Estimate and identify the best possible algorithm for a problem in terms of efficiency.
- Identify and use appropriate asymptotic notations
- Should be able to know the best, worst and average cases for an algorithm.

Prerequisites

Before starting this activity, learners should have an experience, of writing pseudo code.



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Preparation

Optional: Provide the worksheet on the board, a poster, or in presentation software, so teams can see each other's work easily.

Activity Notes

- The facilitator should spend 5 minutes for introducing the activity.
- While student teams work, the facilitator should circulate among the teams to monitor progress and help with problems, although the facilitator should avoid providing or confirming answers to any of the key questions.

Activity History

Before you start, complete the form below to assign a role to each member. If you have 3 people, combine Manager & Reflector.

Team		Date	
Team Role		Team Member	
Recorder: records all answers & questions, and provides copies to team & faculty.			
Speaker: talks to faculty and other teams.			
Manager: keeps track of time and makes sure everyone contributes appropriately.			
Other:			

Introduction

Sorting is the basic operation used in every form of application. Even if you take the contact lists in the cell phone or arrange icons on the desktop in an order/ save files in a folder the sorting algorithm is executed in the background. Let's find out the roots of it in this POGIL sheet.



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(10 min) CASE 1 Planning of strategy:

Given a bowl of marbles arrange them in the order of their size.

- 1: Which marble did you select for the first time?
- 2: Which marble did you select second time?
- 3: How did you select the first marble Describe in sentence?

(5 min) CASE 1 Identifying strategy:

Write down the strategy of arranging the marbles in order.

(10 min) CASE 2 Planning of strategy:

Given the play cards one by one arrange them in the sequence.

1. Note the method (each sequence of steps) of arranging them in the order.

(5 min) CASE 2 Identifying strategy:

Write down the strategy of arranging them in order.

(10 min) CASE 3 Planning of strategy:

Provided the access for any two objects only among 5 at a time. Arrange them in an order .

(5 min) CASE 2 Identifying strategy:

Write down the strategy of arranging them in order.

(15 min) Identifying and comparing the techniques

1. Name the basic methods observed in case1, case2, case3. You provide a name based on the technique you have worked for it.
2. Provided 10 objects in each case list number of steps which method do you consider requires less number of steps by a human.



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3. Is this the same number of steps for the computer also?

(30 min) Tracing with values and finding complexities

1. Given the elements

25 41 21 14 37 18 20 7 235 35

Trace the number of steps using all the three basic sorting techniques

2. Find equations for each method to show number of steps in sorting and derive its asymptotic notation.

3. Compare the three techniques based on the number of steps/ Asymptotic notation.

(15 min) Coding

1. Write code for swapping procedure.

2. For exchange sort write the snippet of code to identify requirement of swapping & code of swapping.

If (condition)

{

Code for swap;


}

3. Write code for selecting the smallest value.

4. For selection sort write the snippet of code to swap the smallest value with the tracing element.

5. Write snippet of code for implementing insertion sort.




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POGIL TASK ON – SEARCHING

Department of CSE

Learning Objectives

After completing this activity, learners should be able to:

- Understand and visualize that there will be numerous algorithms/programs for a problem
- Able to evaluate/ calculate the complexities of the algorithms.
- Estimate and identify the best possible algorithm for a problem in terms of efficiency.
- Identify and use appropriate asymptotic notations
- Should be able to know the best, worst and average cases for an algorithm.

Prerequisites

Before starting this activity, learners should have an experience, of writing pseudocode.

Preparation

Optional: Provide the worksheet on the board, a poster, or in presentation software, so teams can see each other's work easily.

Before you start, complete the form below to assign a role to each member. If you have 3 people, combine Manager & Reflector.



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Recorder: records all answers & questions, and provides copies to team & faculty.	
Speaker: talks to faculty and other teams.	
Manager: keeps track of time and makesure everyone contributes appropriately.	
Other:	

Introduction

In computing, we often must search in a set for a particular item. As computer scientists, we are particularly interested in searching very large sets, with thousands or millions of values. For example, the Harvard University Library has roughly 16,000,000 volumes, and the US Library of Congress has roughly 22 million cataloged books, and over 100,000,000 total items. In this activity, we use a simple game to explore some basic searching algorithms. This will also help us explore more general concepts in algorithm design and analysis, so studying searching is useful even though very few of us may need to implement searching algorithms, since efficient techniques are part of most software libraries.

Hi-Lo Game

Hi-Lo is a number guessing game with simple rules.

- a. There are two players – A and B.
- b. Player A thinks of a number from 1 to 100.
- c. Player B guesses a number.
- d. Player A responds with “too high”, “too low”, or “you win”.
- e. Players B and A continue to guess & respond until B wins (or gives up).

I. (10 min) Player Strategies

1. (3 min) Play the game a few times to ensure that everyone understands the rules.
2. (2 min) List up to 3 ways to clarify the rules.



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3. (3 min) Describe 4-5 different strategies that Player B could use to guess numbers.

Try to have a mixture of simple and clever strategies.

Name each strategy and list it in the first column of the worksheet.

Before you continue, review progress with the facilitator.

II. (10 min) Comparing strategies

1. (2 min) Evaluate each strategy with regard to how **quickly** it will find the right answer, by rank ordering from 1 (least guesses) to 5 (most guesses).

Add the rankings to the worksheet in a column labeled **Quick**.

2. (2 min) Evaluate each strategy with regard to how **easy** it is to describe or specify, by rank ordering from 1 (easiest) to 5 (hardest).

(Suppose you had to explain each strategy to a first-grader so that she could play the game.)

Add the ranking to the worksheet in a column labeled **Easy**.

3. (1 min) For each strategy, multiply the quick rank by the easy rank, and add the product to the worksheet in a column labeled **Product**.

4. (3 min) In complete sentences, describe the relationships between the two sets of rankings.

Before you continue, review progress with the facilitator

III. (10 min) Worst & Average Case Performance

1. (2 min) Discuss and list the pros & cons of measuring program speed with a stopwatch.

2. (3 min) For each strategy, determine the **worst case** (maximum) number of guesses required to win.

Add the numbers to the worksheet in a column labeled **Worst**.

3. (3 min) For each strategy, determine the **average case** (typical) number of guesses required to win.

Add the numbers to the worksheet in a column labeled **Average**.

Note that the **minimum** number of guesses is always 1 – it's nice to be lucky.

4. (2 min) List 3 reasons why it would be useful to have more precise, quantitative ways to measure and discuss the speed of an algorithm.

Before you continue, review progress with the facilitator.



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IV. (10 min) Effect of Input Size

1. (3 min) Assume that Player A chooses a number from 1 to 1000.

For each strategy, what are the worst case & average case number of guesses?

Add the numbers to the worksheet in columns labeled “1K Worst” and “1K Average”.

2. (4 min) **Optional:** Assume that Player A chooses a number from 1 to N. (For example, N=100, N=1000, N=1,000,000)

For each strategy, what are the worst case & average case number of guesses in terms of N?

Add the expressions to the worksheet in columns labeled “N Worst” and “N Average”.

(Hint: you’ve already done N=100 and N=1000; consider other values before generalizing to N.)

3. (3 min) Describe the pros & cons of analysing performance in terms of input size N

WORKSHEET

Strategy name	Quick	Easy	prod	Worst	Average	1k Worst	1k Average	N worst	N Average




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SAMPLE COPY OF POGIL PRACTICE SHEETS

DSD
STJ



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

YEAR & SEM: II year II sem - R18 - ECE

POGIL TASK ON: Design of a full-adder circuit

FACULTY INFORMATION: G. Swarnalatha
Asst. Prof.

Batch no:	Date:
Team Role	Team Member Name
Recorder: records all answers & questions, and provides copies to team & faculty.	N. Vinita
Speaker: talks to faculty and other teams.	T. Saijyothna
Manager: keeps track of time and makes sure everyone contributes appropriately.	P. Saiprasanna
Other:	

Learning Objectives:

- Understand which gates are used to design full adder circuit and function of each logic gate.
- Able to Design the larger arithmetic circuits from smaller building blocks.

Introduction: Addition is one of the most common operations performed by computer systems. We can design adder circuits to perform addition using logic gates. Full-adder circuit can be designed using XOR and AND, OR gates. And full adder can be made using 2 half adders. Full adder is a logic circuit that adds two input bits plus a carry in bit & outputs a carry out bit & sum bit.

Procedure to solve:

Steps

- First write the truth table for full adder consists of two inputs (A, B) and carry in (Cin), outputs
- ↳ Carry out (Cout)

→ k-map obtain the Boolean expressions and carry outputs individually.





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Truth table

Inputs			Outputs	
A	B	C_{in}	Car	S
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

→ Boolean Expressions for S and Car

$$S = A \oplus B \oplus C_{in}$$

$$Car = (A+B) \cdot C_{in} + A \cdot B$$

→ Finally draw the logic diagram using required logic gates.




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Design or coding:

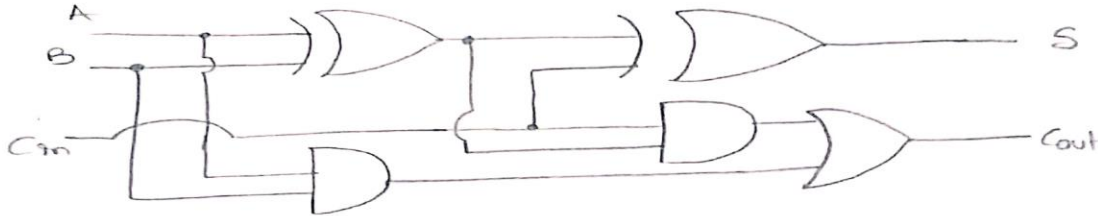


Fig logic diagram for full adder using logic gates.

Results :

If input $A=1$, $B=0$ and $C_{in}=1$
Then sum $(S) = A \oplus B \oplus C = 1 \oplus 0 \oplus 1 = 0$
Carry out $(C_{out}) = (A \oplus B) \cdot C_{in} + A \cdot B$
 $= 1$.

(55)




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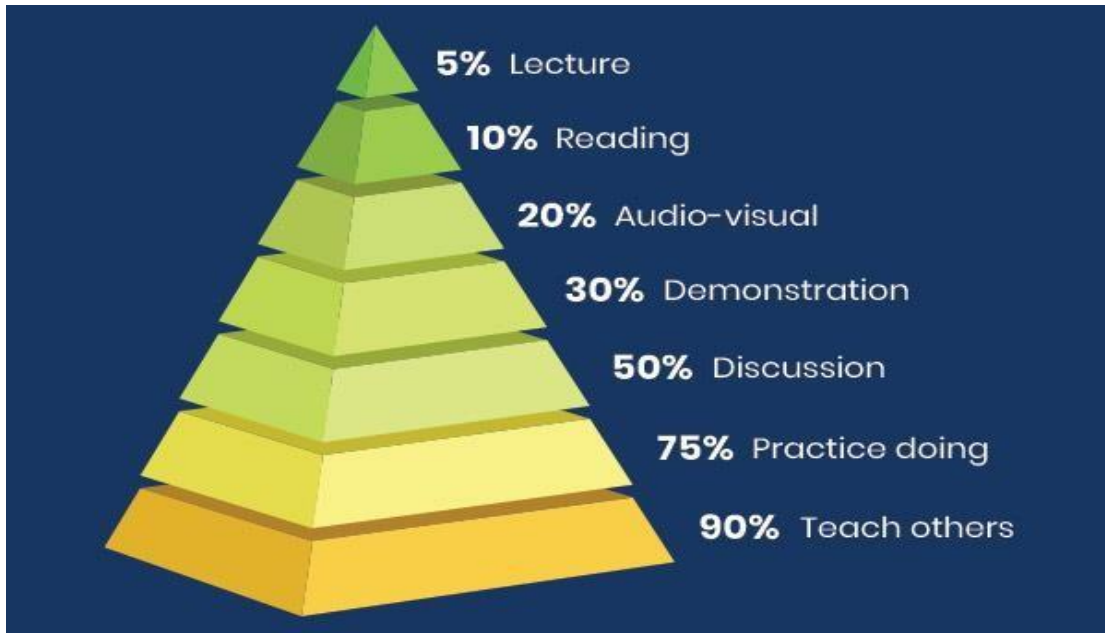


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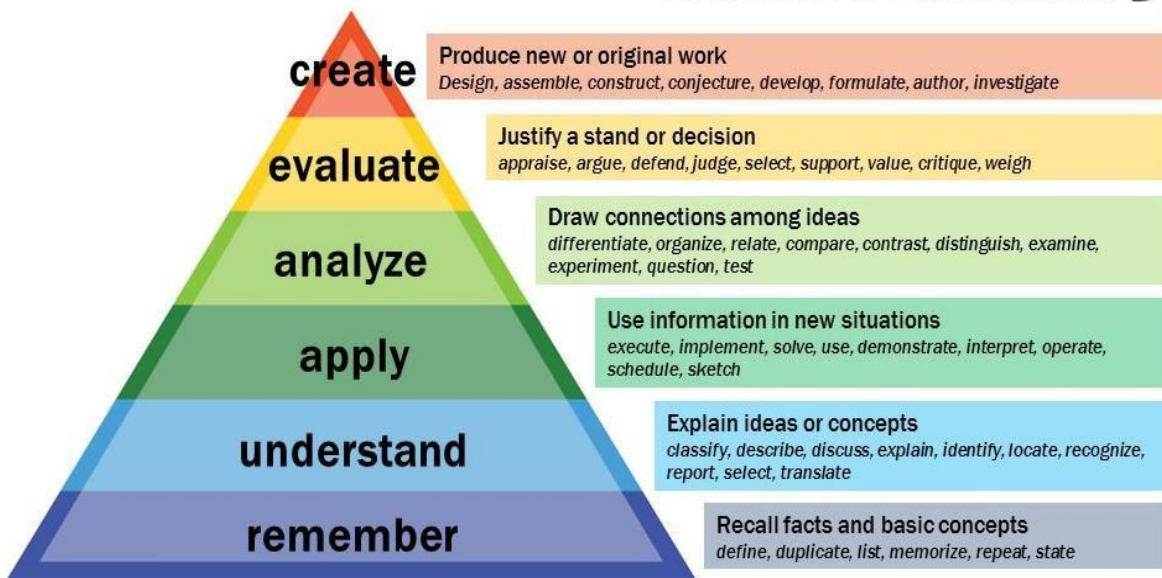
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BLOOM'S TAXONOMY



Bloom's Taxonomy



PYRAMIDAL LEARNING



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5). Course-Based Projects:

This new Program allows prospective Engineering students to see Industry from a student's perspective and allows students to spend a week with a current engineering in the multidisciplinary areas (Computer, Electrical, Electronics and Communication, Software & Hardware, or Systems Design) at the Industry and see what Industry life is really like. Visiting students will go around the Industry, see the manufacturing processes and facilities, and most importantly, get time to talk with working Engineers about their experiences. The Program is an opportunity for budding Engineers to learn what it means to be an Engineer. Students who participate in the program will spend time at that company while they are visiting.



COURSE-BASED PROJECTS



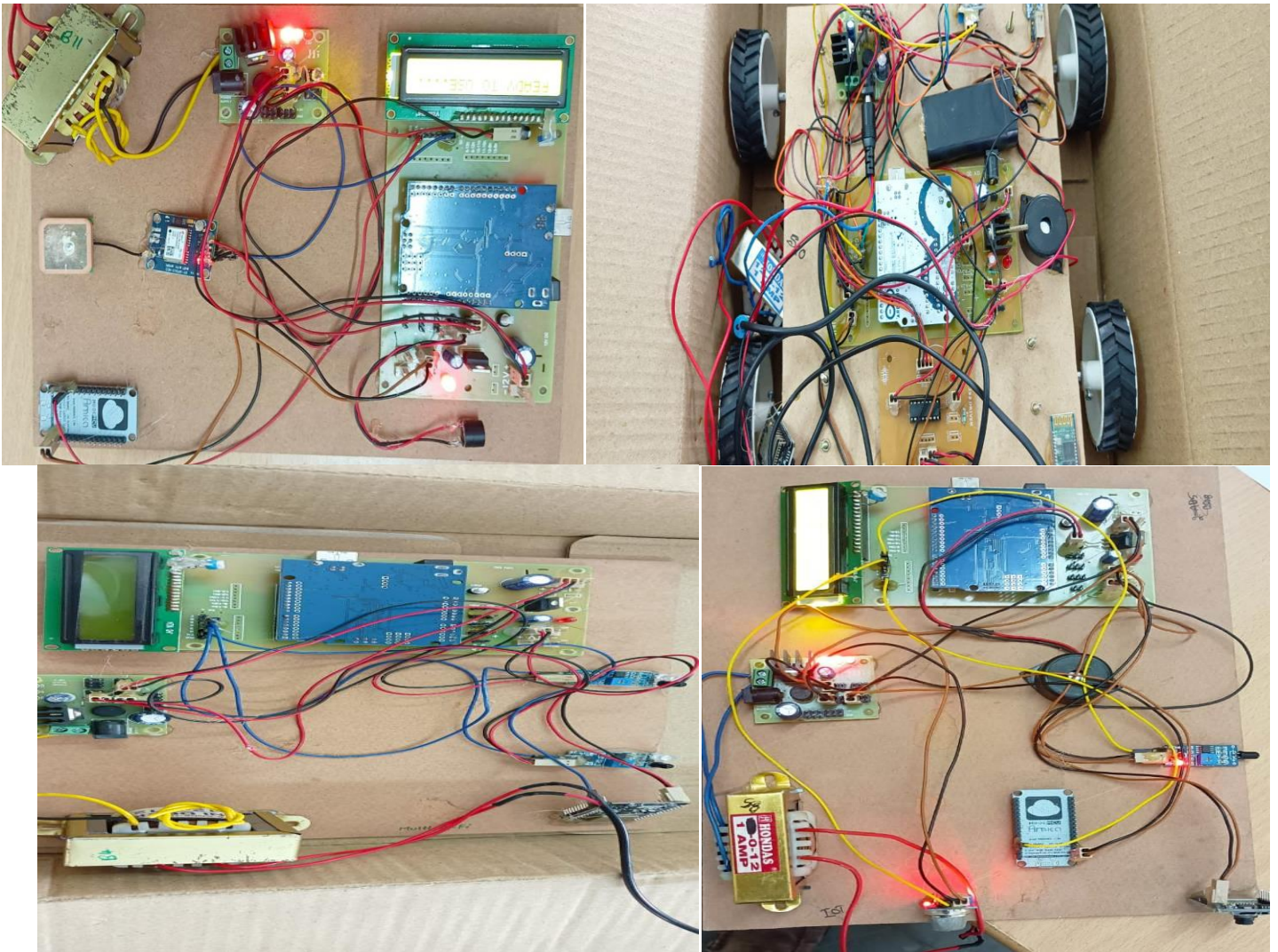
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COURSE-BASED PROJECTS




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6). Career Vision Approach:

Career Vision Approach is a method about what a student want to achieve in his **career** -- the major accomplishments a student hope to attain, the level or position to rise to, and the lasting impacts to make. This method should be something that inspires, energizes, motivates, and directs the SCIENT student towards their goal.



MOTIVATION TOWARDS GOAL




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7). Flipped classroom & Blended learning:

Blended Learning is a combination of online learning and face-to-face learning (often referred to as “traditional learning”). In Flipped **learning** teachers, administrators and instructors prepare audio or video lectures for learners to watch at home, on their own time. Research has proven that blended or flipped classrooms are the most effective pedagogical approach to learning because they move learning in the classroom from being a 'passive' experience to an 'active' one for student.



TRADITIONAL LEARNING




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BEST PRACTICE-2

1. Title of the practice:

STUDENT PROJECTS BASED ON SOCIETAL EMPOWERMENT.

2. Objectives of the practice:

- Involve students and faculty in interdisciplinary research in cutting-edge technologies
- To sharpen the student's practical laboratory skills.
- To upgrade the student's ability to collect, analyze and interpret experimental data.
- To upgrade skills in developing societal projects
- To motivate them towards their goal

3. The Context:

The course structure assigns credits to the industry participation through Mini-Projects, Major Projects addressing the societal needs and Internships. **The Research and Development Cell** of the institute, promotes research and innovation in technologies

4. The Practice:

Course-based projects, The best way to master a subject is by doing **projects**. Through a **project** student not only get a deeper understanding of the subject but also gain hands-on practical experience

Certificate Courses: Certification Course helps an individual to showcase his competency, commitment for the profession, build expertise in his professional subject area, and helps with job advancement. It is a designation earned by a person giving a kind of assurance to the company of his competencies of performing a job.

Big Idea Competition: **Scient** Institute provides platform for our students to explore their innovations, intellectual projects and big ideas. R&D cell conducting project exhibition to develop projects for **societal empowerment** in the fields of Agriculture, Educations, Health and Swachatha

Weekend projects lab transform classroom learning into a project-based experience.

SCIENT HACKATHON: SCIENT HACKATHON is proving grounds for new ideas. They're especially good tools to stimulate the creative and problem-solving juices of developers. Unlike their course based projects where risk-taking may be frowned upon, in a hackathon there is a low cost of failure.



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Research & Development Cell is important to gain knowledge to develop, design, enhance, and modify societal empowerment projects, services, technologies, business plans, processes and sometimes vision. R&D cell motivate students to incubate their ideas.

Entrepreneur and Development Cell: Inculcate entrepreneurial spirit and culture among the Engineering graduates and post graduates. ED cell conduct programs in Entrepreneurship enabling skills.

5. Evidence of Success:

Projects like "smart Helmet", "Cough and wheeze analyzer for respiratory digital health services", 'Solar Powered car' and 'Weapon Locking and Tracking system'.

Some societal empower projects like 'smart walking stick for blind and old age people', 'fully automated solar power grass cutter', 'development of effective wireless sensor network system for water quality and quantity monitoring'. Automated Commando Training System for Greyhounds and 86 Social projects are executed successfully by SCIENT students.

6. Problems Encountered and Resources Required:

Maintaining equilibrium between Research and Academia.


Identifying and retaining the research team

Expertise training in upcoming technologies, on a continuous basis.

Institutional network beyond the academic sphere.

Development of non-scientific skills related to research




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HACKATHON CERTIFICATE





SCIENT INSTITUTE OF TECHNOLOGY & PHARMACY

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IBRAHIMPATNAM-501506, RANGA REDDY DIST., TELANGANA


CERTIFICATE OF PARTICIPATION

This is to certify that Mr/Ms M. SAI KIRAN Studying IV
B.Tech CSE Branch of SCIENT INSTITUTE OF TECHNOLOGY College has
Participated in "HACKATHON" on Web Development held on 3rd and 4th October 2018
In Collaboration With *Brain O Vision Solutions India Pvt. Ltd*

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Entrepreneur and Development Cell:

Scient Institute of Technology - Placement cell organized a one day seminar on "CAREER GUIDANCE" in association with ACE Academy A.Y.2023-24.




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Scient Institute of Technology - Placement Cell organized a Student Development Programme on CAMPUS TO CORPORATE in collaboration with ICFAI BUSINESS SCHOOL A.Y.2023-24.




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Student development program on "CAMPUS TO CORPORATE" seminar Organized by placement cell




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Industrial visits

Industrial visits provide the students with an opportunity to learn practically through interaction, working methods and employment practices. It gives the students an exposure to current work practices as opposed to theoretical knowledge being taught at their college classrooms

Scient Institute of Technology organized a Industrial tour in association with TASK at Infosys SEZ Campus,Pocharam,Hyderabad A.Y.2023-24.



Scient Institute of Technology organized a Industrial tour in association with TASK at NRSC,Hyderabad A.Y.2023-24.



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Department of ECE & EEE organized an Industrial visit for II year students to NRSC(National Remote Sensing Center) , Jeedimetla,Hyderabad A.Y 2023-24.





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