

**BATCH 2023**

**WELCOME**

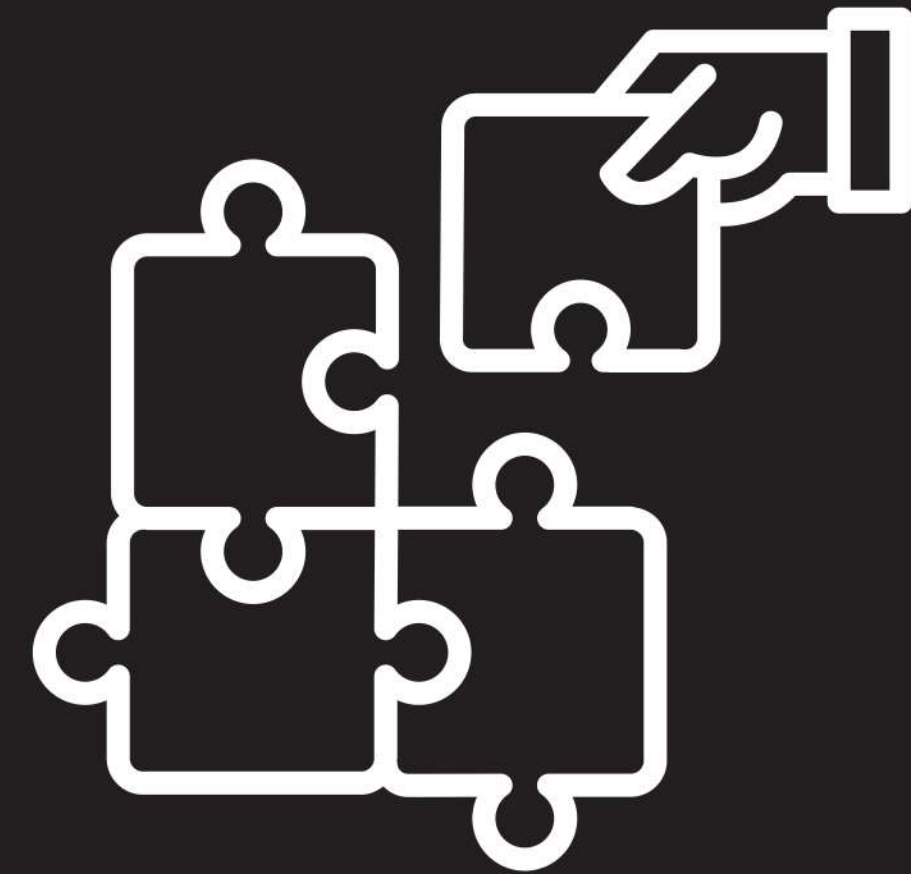
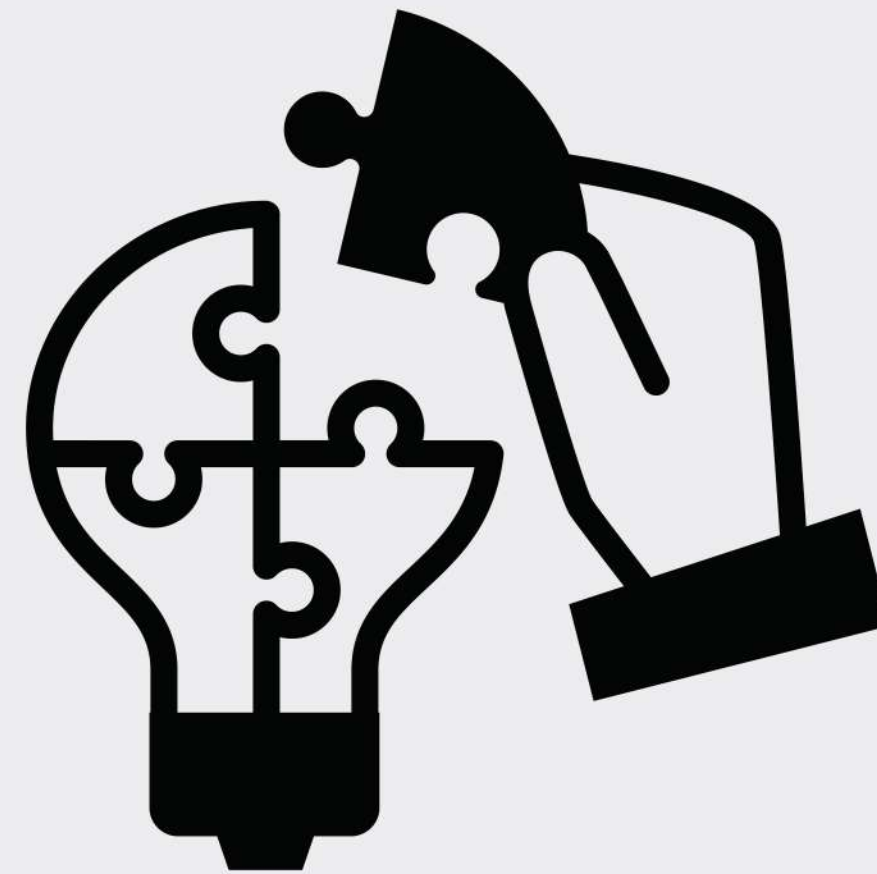
**to Computer Science  
Department**

**PROF. MUHAMMAD IQBAL BHAT**

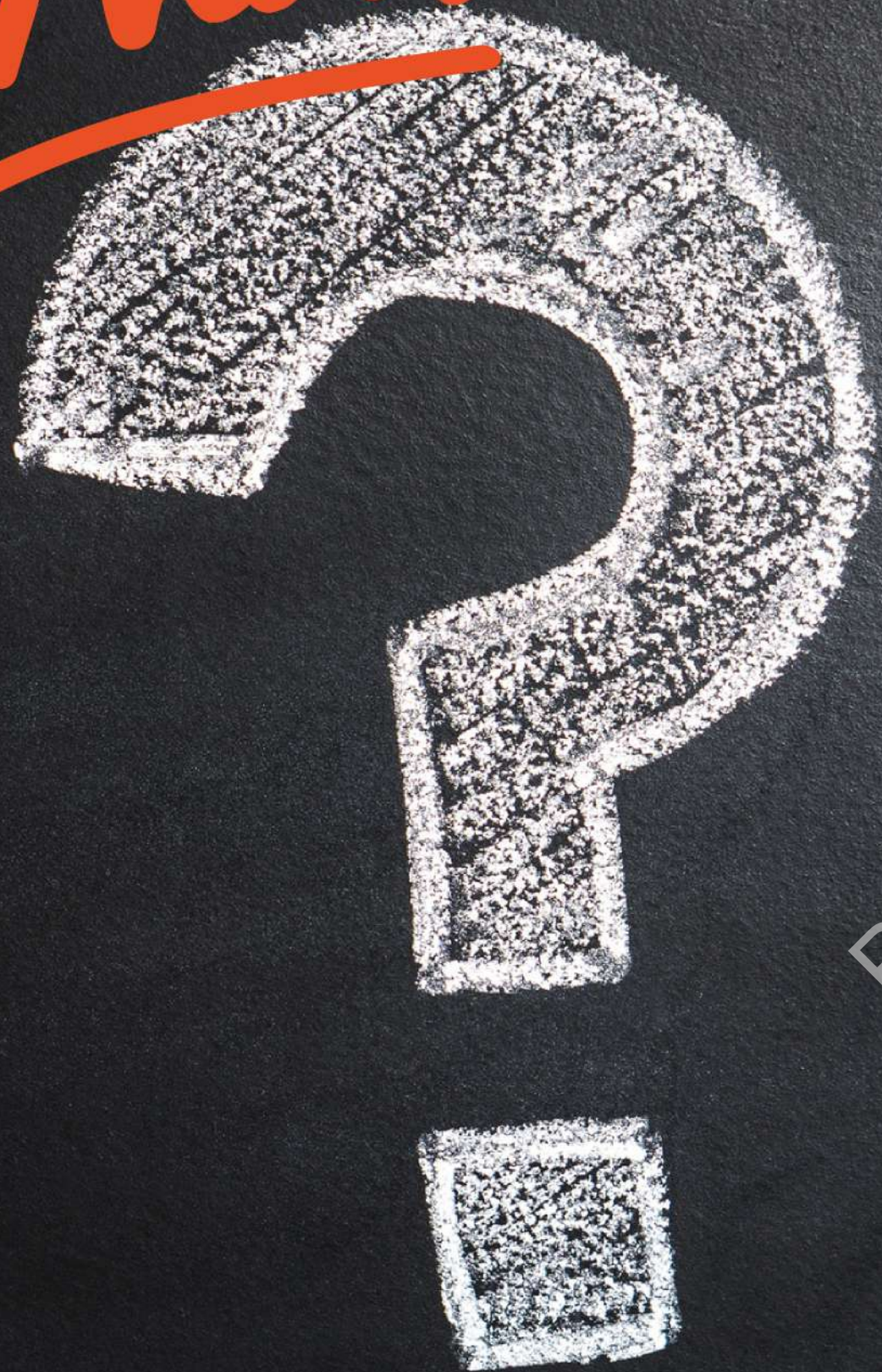
**Head**

**Department of Computer Sciences**

Computer science is not just about coding, it's about problem-solving, creativity, and innovation that can change the world.



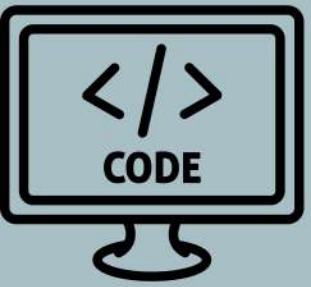
# What? IS COMPUTER SCIENCE



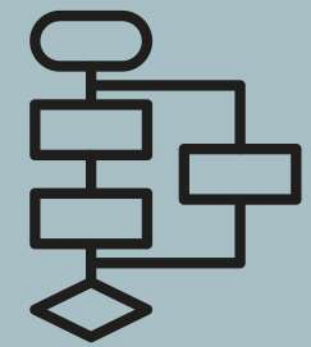
**Computer Science is the study of computers and computational systems. Unlike electrical and computer engineers, computer scientists deal mostly with software and software systems; this includes their theory, design, development, and application.**

Prof. M. Iqbal Bhat (UJHEP)

# Computer Science encompasses a wide range of topics, including



- **Programming languages:** Programming languages are used to write instructions for computers to follow. Some popular programming languages include Python, Java, C++, and JavaScript.



- **Data structures and algorithms:** Data structures are ways of organizing data so that it can be efficiently accessed and manipulated. Algorithms are step-by-step instructions for solving problems.



- **Computer architecture:** Computer architecture is the study of how computers are designed and built.

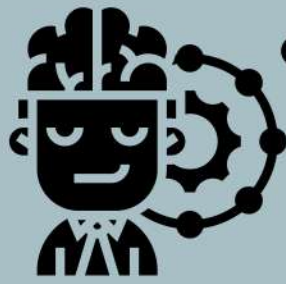


- **Software engineering:** Software engineering is the process of designing, developing, testing, and maintaining software.

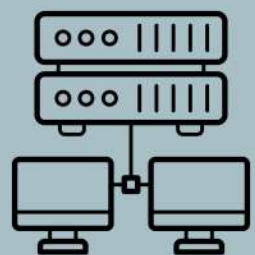
# Computer Science encompasses a wide range of topics, including



- **Artificial intelligence:** Artificial intelligence is the field of computer science that deals with creating intelligent agents, which are systems that can reason, learn, and act autonomously.



- **Machine learning:** Machine learning is a type of artificial intelligence that allows computers to learn without being explicitly programmed.



- **Computer networks:** Computer networks are systems that allow computers to communicate with each other.



- **Database systems:** Database systems are used to store and manage large amounts of data.



- **Computer security:** Computer security is the field of computer science that deals with protecting computers and networks from cyberattacks.



# Importance of Computer Science

Computer science drives innovation in every field and industry. Understanding coding languages can create limitless opportunities for employment and growth.

Prof. M. Iqbal Bhat (UKIHD)

# Importance of Computer Science

## Why is Computer Science Important?

## Statistics

Computer science is used in every aspect of our lives, from our personal devices to the critical infrastructure that powers our society.

According to the World Economic Forum, digital skills are among the top 10 most in-demand skills for the future of work.

Computer science graduates are in high demand in a wide range of industries.

A 2022 study by LinkedIn found that computer science jobs are the most in-demand jobs in the world.

Computer science graduates can expect to earn a good salary.

The average salary for computer science jobs is 57% higher than the average salary for all jobs.

Computer science is at the forefront of many of the most important challenges facing the world today, such as climate change, healthcare, and education.

According to a 2023 report by the National Science Foundation, computer science research and development is expected to grow at a rate of 12% per year over the next decade.

# Importance of Computer Science

Statistic	Value	Source
Percentage of the world's data created in the last two years	90%	IBM
Expected growth of the global artificial intelligence market from 2021 to 2028	400%	MarketsandMarkets
Expected growth of the global cybersecurity market from 2021 to 2027	63%	Statista
Percentage of software developers in the US who identify as female	25%	US Bureau of Labor Statistics
Median annual salary for software developers in the US	\\$110,140	US Bureau of Labor Statistics
Percentage of computer science graduates who are employed within six months of graduation	95%	National Association of Colleges and Employers



# Importance of Computer Science

In addition to the statistics above, here are some other examples of the importance of computer science:

- Computer science is used to develop new medical technologies, such as MRI machines and artificial intelligence-powered diagnostic tools.
- Computer science is used to develop new educational technologies, such as online learning platforms and personalized learning software.
- Computer science is used to develop new renewable energy technologies, such as solar panels and wind turbines.
- Computer science is used to develop new transportation technologies, such as self-driving cars and electric vehicles.

# Computer Science and Job Market

Coding skills are in high demand across all industries. Computer science graduates have a competitive edge and a wide range of career options.

# JOB for Programmers

Programming language	Number of jobs	Median annual salary
Python	68,534	\\$110,140
SQL	57,971	\\$103,220
Java	57,236	\\$110,510
JavaScript	48,041	\\$106,970
C	35,702	\\$111,120
C++	35,281	\\$110,950

Programming language	Number of jobs	Median annual salary
Go	32,503	\\$124,290
C#	29,084	\\$106,500
Swift	27,345	\\$113,970
R	26,832	\\$109,530
PHP	26,602	\\$101,580



# Course Structure for FYUGP in Computer Applications

Prof. M. Iqbal Bhat (JKHED)

**PROPOSED FYUP CURRICULAR FRAMEWORK UNDER NEP - 2020 (WITH ONE MAJOR AND ONE MINOR)**

BLOCK		I			II			III				
		SEM-I	SEM-II	SEM-III	SEM-IV	SEM-V	SEM-VI	SEM-VII	HONOURS	TOTAL	RESEARCH	
SEMESTER →		CREDITS										
SUBJECT TYPE ↓		CREDITS										
<b>MAJOR</b> SUBJECT-A	CT-3 (COURSE TYPE)				4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	30	
	CT-2	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	4*	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	28	
	CT-1				3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	20 + 18	3 + 1 = 4
<b>MINOR</b> SUBJECT-B	CT-1	4 + 2 = 6	4 + 2 = 6	4 + 2 = 6	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	3 + 1 = 4	20 + 18	3 + 1 = 4
<b>INTERNSHIP/RESEARCH</b>						2* (SUMMER/WINTER INTERNSHIP)					2	12 RESEARCH PROJECT
<b>MULTI-DISCIPLINARY COURSES (MDCs)</b>		3	3	3							9	
<b>ABILITY ENHANCEMENT COURSES (AECs)</b>		3 (ENGLANG/ COMM SKILL)	3 (COMM SKILL/ ENGLANG)	3 (MIL)							9	
<b>VALUE-ADDED COURSES (VACs)</b>		2 x 2 = 4 (ENV. STD & H&W)	2 x 2 = 4 (UND. INDIA & DTS)								8	
<b>SKILL ENHANCEMENT COURSE VERTICAL (SEC)</b>		2 + 2 = 4	2 + 2 = 4	2 + 2 = 4							12	
<b>TOTAL CREDITS</b>		<b>26</b>	<b>26</b>	<b>22</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>174</b>	<b>20</b>





### Left out Courses

- PLP
- Systems Prog
- Simulation
- Numerical Meth
- Operations Research
- Object Or Design
- Internet tech
- ASP.NET Core
- Wireless & Mobile
- Cloud Comp
- Microprocessor ALP
- Compiler Design
- Image Processing
- Graphics
- Cryptography

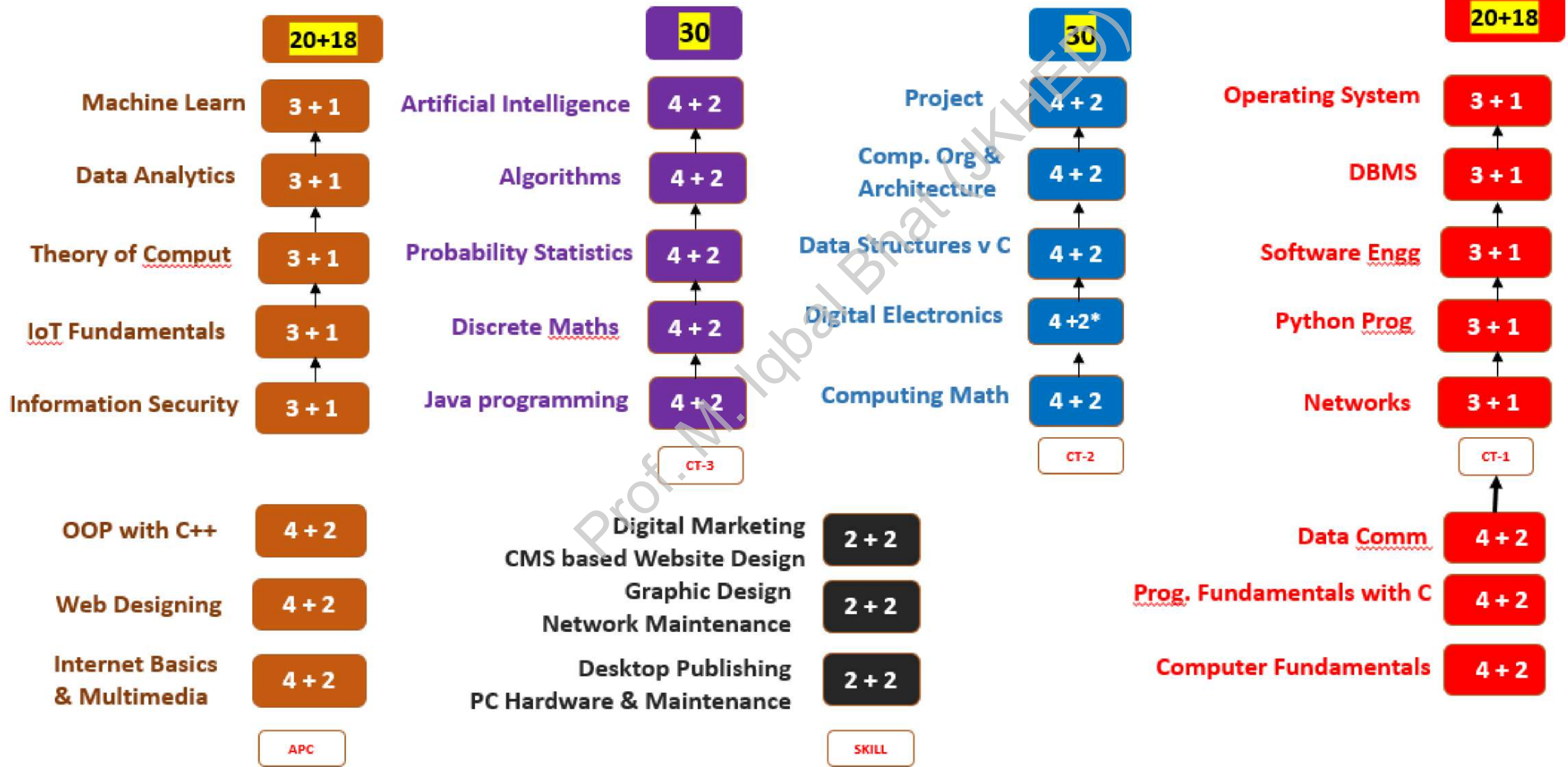
- Linux and Server Administration
- Functional Programming with F#
- Robotics
- Shell Scripting
- Raspberry Pi and Arduino
- Principles of UI Design

## PROPOSED CREDIT BREAKUP SINGLE/DOUBLE MAJOR WITH A MINOR SUBJECT

**\*\*Project** VIII B  
(Research)

**3 + 1** **Research Method**    **3 + 1** **DSE**    **12\*\*** **Research Project**

- Total**
- VIII A  
(HONS)
- VII
- VI
- V
- IV
- Course  
Type
- III
- II
- I

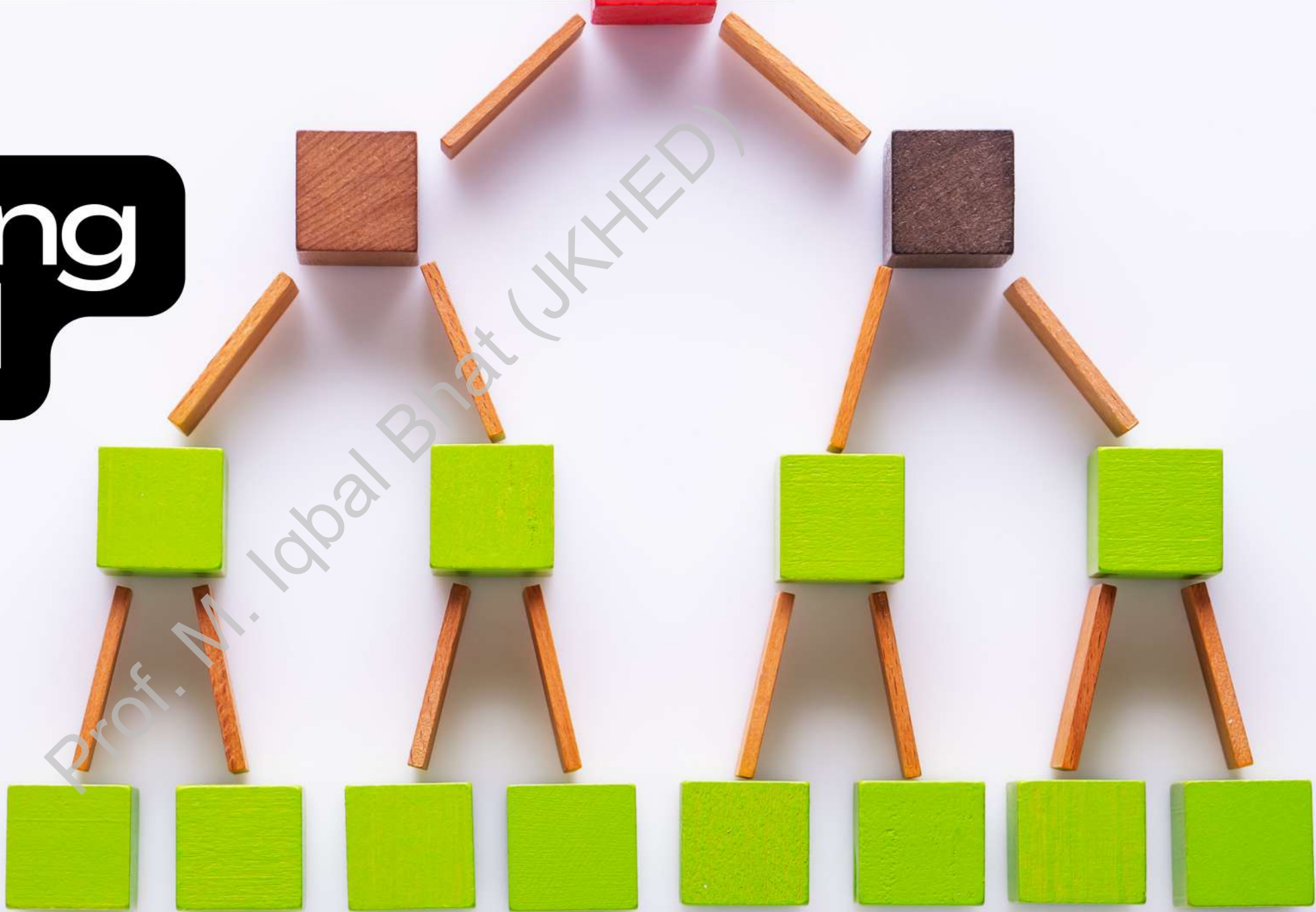


Semester	Major Course CT0 3+1	Major Course CT1 4+2	Major Course CT2 4+2	Minor (APC) 3+1
1	Computer Fundamentals			Web Designing
2	Programming Fundamentals with C			Cloud Computing
3	Data Communication & Networks			Frontend Programming
4	Digital Electronics	Computing Mathematics	OOP with Java	Information Security
5	Python Programming	Computer Organisation & Architecture	Discrete Mathematics	Mobile Development
6	Operating System	Data Structures using C	Artificial Intelligence	Foundations of IoT
7	Database Management System	Algorithms	Theory of Computation	Machine Learning
8	Software Engineering	Project	Computer Graphics & Image Processing	Advanced Web Development

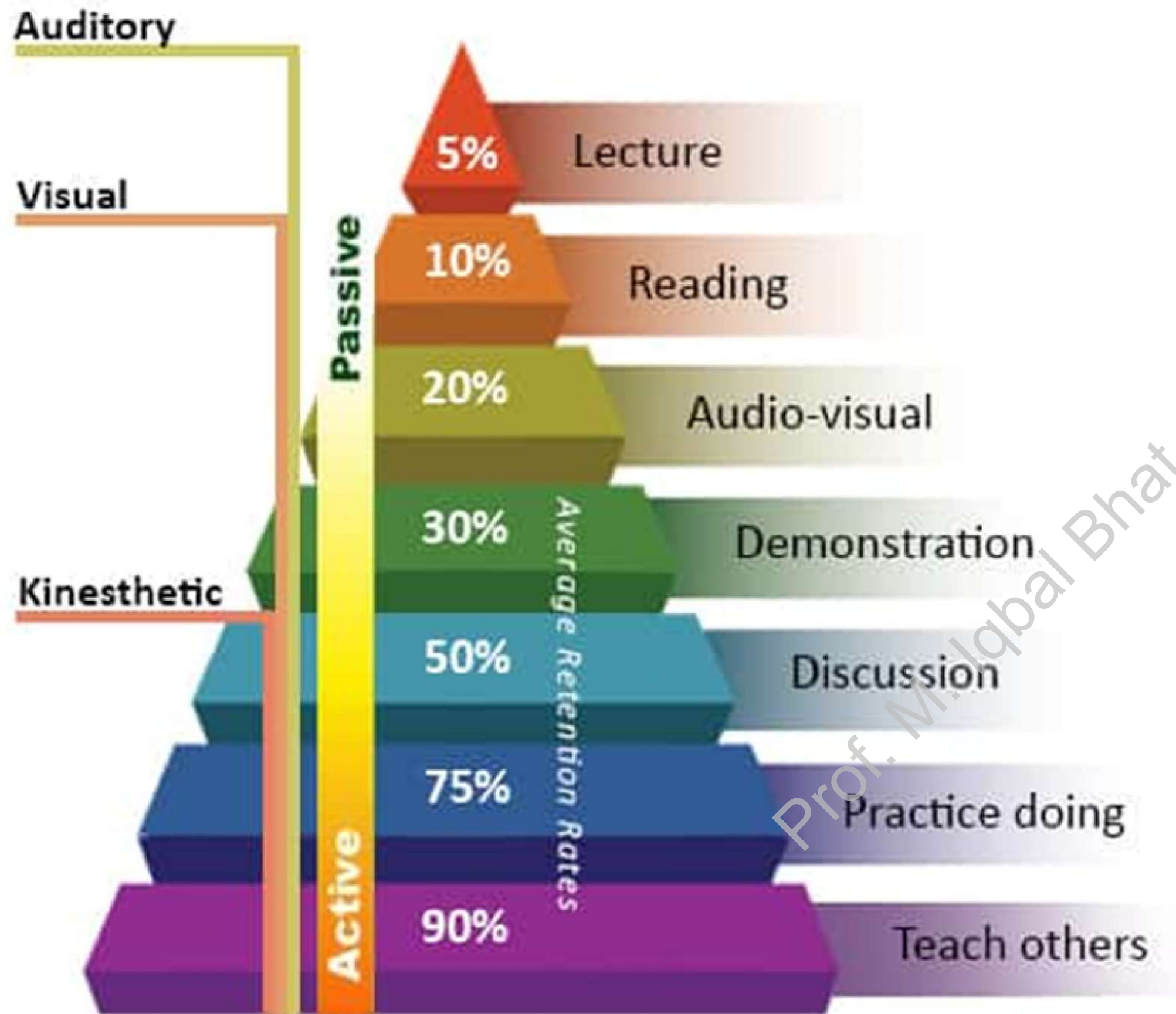


# Learning Strategy

## The Learning Pyramid



# Introduction



The Learning Pyramid suggests we retain 90% of information by teaching others or using immediately. 30% by demonstration, 20% by audiovisual, 10% by reading and 5% by lecture. Three learning styles include visual, auditory, and kinesthetic.

# Learning Pyramid Levels

Lecture and reading are the least effective learning methods.

Audiovisual methods and demonstrations are more effective.

Practice and teaching others are the most effective methods.





# Lecture

The learning pyramid shows that lectures are the least effective form of learning, with only a 5% retention rate. Use visuals and active learning instead.



# Reading

Active reading strategies such as note-taking, summarizing, and asking questions can improve retention and comprehension of reading material.



# Audiovisual

The Learning Pyramid suggests that we retain 90% of what we learn when we use audiovisual methods. Use videos, images, and sound to enhance learning.

Prof. M. Iqbal Bhat (JKHEP)



# Demonstration

THE LEARNING  
PYRAMID SHOWS  
THAT WE RETAIN 90%  
OF WHAT WE LEARN  
WHEN WE TEACH  
OTHERS OR USE IT  
IMMEDIATELY.  
PRACTICE AND  
FEEDBACK ARE  
CRUCIAL!

Prof. M. J. Abal Bralukhed

# Discussion

The Learning Pyramid suggests that we retain 10% of what we read, 20% of what we hear, 30% of what we see, 50% of what we see and hear, 70% of what we say, and 90% of what we do. Discuss how you can apply this in your learning process.

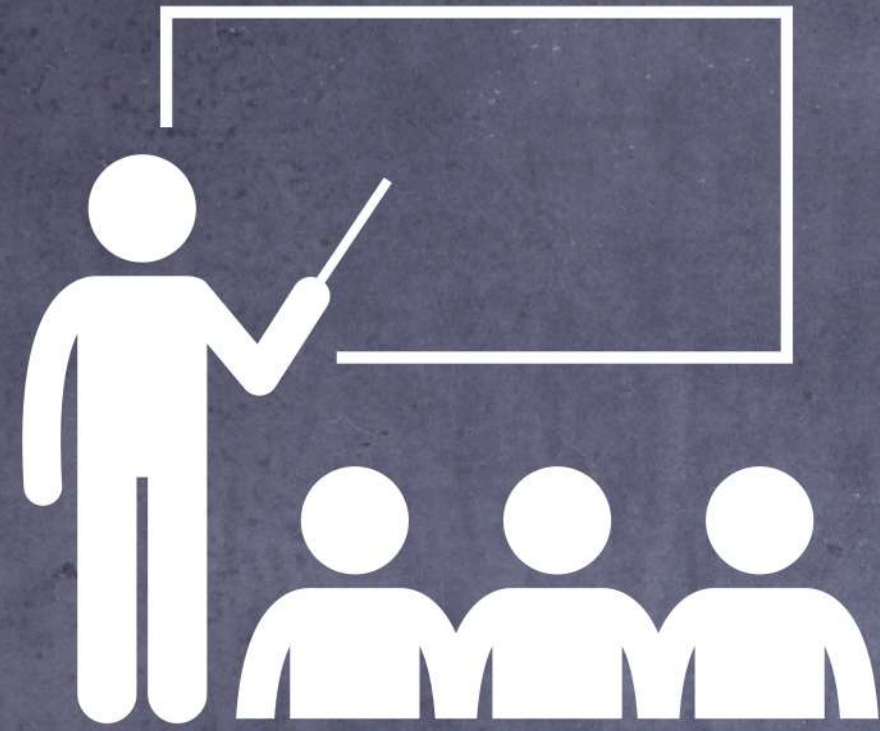






# Practice by Doing

The Learning Pyramid suggests that learners retain 90% of what they learn when they put new skills into practice immediately after learning them.



# Teach Others

ACCORDING TO THE LEARNING PYRAMID, TEACHING OTHERS IS THE MOST EFFECTIVE WAY OF RETAINING INFORMATION. IT INVOLVES ACTIVE LEARNING AND BOOSTS CONFIDENCE.



*Thank  
You*

Prof. M. Iqbal Bhat (JKHED)

