

# University of Mumbai



No. AAMS\_UGS/ICC/2024-25/ 103

## CIRCULAR:-

Attention of the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Departments is invited to this office circular No. AAMS\_UGS/ICC/2024-25/4 dated 11<sup>th</sup> June, 2024 relating to the NEP UG & PG Syllabus.

They are hereby informed that the recommendations made by the **Ad-hoc Board of Studies in Computer Science** at its meeting held on 01<sup>st</sup> July, 2024 and subsequently passed by the Board of Deans at its meeting held on 10<sup>th</sup> July, 2024 **vide** item No. 6.5 (R) have been accepted by the Academic Council at its meeting held on 12<sup>th</sup> July, 2024 **vide** item No.6.5 (R) and that in accordance therewith to correction in the syllabus 1) on page 10 Subject Table for Sem- II –VSC subject title to be read as Web Technologies instead of Web designing 2) on page 50 the Title of the VSC subject to be read as Web Technologies instead of Web Designing for the **B.Sc. (Computer Science) (Sem. I & II)** as per appendix (NEP 2020) with effect from the academic year 2024-25.

(The circular is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032  
22<sup>nd</sup> August, 2024  
To

*Baliram*  
(Prof.(Dr) Baliram Gaikwad)  
I/c Registrar

The Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Department.

**A.C/6.5(R)/12/07/2024**

Copy forwarded with Compliments for information to:-

- 1) The Chairman, Board of Deans,
- 2) The Dean, Faculty of Science & Technology,
- 3) The Chairman, **Ad-hoc Board of Studies in Computer Science**,
- 4) The Director, Board of Examinations and Evaluation,
- 5) The Director, Board of Students Development,
- 6) The Director, Department of Information & Communication Technology,
- 7) The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari.
- 8) The Deputy Registrar, Admissions, Enrolment, Eligibility & Migration Department (AEM),

<b>Copy forwarded for information and necessary action to :-</b>	
1	The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Dept)(AEM), <a href="mailto:dr@eligi.mu.ac.in">dr@eligi.mu.ac.in</a>
2	The Deputy Registrar, Result unit, Vidyanagari <a href="mailto:drresults@exam.mu.ac.in">drresults@exam.mu.ac.in</a>
3	The Deputy Registrar, Marks and Certificate Unit,. Vidyanagari <a href="mailto:dr.verification@mu.ac.in">dr.verification@mu.ac.in</a>
4	The Deputy Registrar, Appointment Unit, Vidyanagari <a href="mailto:dr.appointment@exam.mu.ac.in">dr.appointment@exam.mu.ac.in</a>
5	The Deputy Registrar, CAP Unit, Vidyanagari <a href="mailto:cap.exam@mu.ac.in">cap.exam@mu.ac.in</a>
6	The Deputy Registrar, College Affiliations & Development Department (CAD), <a href="mailto:deputyregistrar.uni@gmail.com">deputyregistrar.uni@gmail.com</a>
7	The Deputy Registrar, PRO, Fort, (Publication Section), <a href="mailto:Pro@mu.ac.in">Pro@mu.ac.in</a>
8	The Deputy Registrar, Executive Authorities Section (EA) <a href="mailto:eau120@fort.mu.ac.in">eau120@fort.mu.ac.in</a>  He is requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to the above circular.
9	The Deputy Registrar, Research Administration & Promotion Cell (RAPC), <a href="mailto:rapc@mu.ac.in">rapc@mu.ac.in</a>
10	The Deputy Registrar, Academic Appointments & Quality Assurance (AAQA) dy.registrar.tau.fort.mu.ac.in <a href="mailto:ar.tau@fort.mu.ac.in">ar.tau@fort.mu.ac.in</a>
11	The Deputy Registrar, College Teachers Approval Unit (CTA), <a href="mailto:concolsection@gmail.com">concolsection@gmail.com</a>
12	The Deputy Registrars, Finance & Accounts Section, fort <a href="mailto:draccounts@fort.mu.ac.in">draccounts@fort.mu.ac.in</a>
13	The Deputy Registrar, Election Section, Fort <a href="mailto:drelection@election.mu.ac.in">drelection@election.mu.ac.in</a>
14	The Assistant Registrar, Administrative Sub-Campus Thane, <a href="mailto:thanesubcampus@mu.ac.in">thanesubcampus@mu.ac.in</a>
15	The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan, <a href="mailto:ar.seask@mu.ac.in">ar.seask@mu.ac.in</a>
16	The Assistant Registrar, Ratnagiri Sub-centre, Ratnagiri, <a href="mailto:ratnagirisubcentre@gmail.com">ratnagirisubcentre@gmail.com</a>

**Copy for information :-**

1	P.A to Hon'ble Vice-Chancellor, <a href="mailto:vice-chancellor@mu.ac.in">vice-chancellor@mu.ac.in</a>
2	P.A to Pro-Vice-Chancellor <a href="mailto:pvc@fort.mu.ac.in">pvc@fort.mu.ac.in</a>
3	P.A to Registrar, <a href="mailto:registrar@fort.mu.ac.in">registrar@fort.mu.ac.in</a>
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), <a href="mailto:camu@accounts.mu.ac.in">camu@accounts.mu.ac.in</a>

1	The Chairman, Board of Deans
2	The Dean, Faculty of Humanities,
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, <a href="mailto:dboee@exam.mu.ac.in">dboee@exam.mu.ac.in</a>
5	The Director, Board of Students Development, <a href="mailto:dsd@mu.ac.in@gmail.com">dsd@mu.ac.in@gmail.com</a> <b>DSW</b> <a href="mailto:direcotr@dsw.mu.ac.in">direcotr@dsw.mu.ac.in</a>
6	The Director, Department of Information & Communication Technology,
7	The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari, <a href="mailto:director@idol.mu.ac.in">director@idol.mu.ac.in</a>

## As Per NEP 2020

### University of Mumbai



#### Title of the program

- A- U.G. Certificate in Computer Science
- B- U.G. Diploma in Computer Science
- C- B.Sc. (Computer Science)
- D- B.Sc. ( Hons.) in Computer Science
- E- B.Sc. (Hons. with Research) in Computer Science

#### Syllabus for

#### Semester – I & II

Ref: GR dated 20<sup>th</sup> April, 2023 for Credit Structure of UG

(With effect from the academic year 2024-25 progressively)

# University of Mumbai



(As per NEP 2020)

Sr. No.	Heading	Particulars	
<b>1</b>	<b>Title of program</b> O: _____ <b>A</b>	<b>A</b>	<b>U.G. Certificate in Computer Science</b>
	O: _____ <b>B</b>	<b>B</b>	<b>U.G. Diploma in Computer Science</b>
	O: _____ <b>C</b>	<b>C</b>	<b>B.Sc. (Computer Science)</b>
	O: _____ <b>D</b>	<b>D</b>	<b>B.Sc. (Hons.) in Computer Science</b>
	O: _____ <b>E</b>	<b>E</b>	<b>B.Sc. (Hons. with Research) in Computer Science</b>
<b>2</b>	<b>Eligibility</b> O: _____ <b>A</b>	<b>A</b>	<p>A candidate for being eligible for admission must have passed <b>Higher Secondary School Certificate Examination</b> (Std. XII) in <b>Science stream</b> conducted by the Maharashtra State Board of Secondary and Higher Secondary Education with <b>Mathematics and Statistics as one of the subject</b> or its equivalent. Admission will be on merit, based on order of preference as follows:</p> <ol style="list-style-type: none"> <li>1. Aggregate Marks at H.S.C. or equivalent.</li> <li>2. Aggregate Marks in Science Group (Physics, Chemistry and Mathematics)</li> <li>3. Marks in Mathematics and Statistics and Physics. Marks in Mathematics and Statistics.</li> </ol> <p style="text-align: center;"><b>OR</b></p> <p>Passed Equivalent <b>Academic Level 4.0</b> with <b>Mathematics and Statistics as one of the subject</b></p>
	O: _____ <b>B</b>	<b>B</b>	Under Graduate Certificate in Computer Science <b>Academic Level 4.5</b>
	O: _____ <b>C</b>	<b>C</b>	Under Graduate Diploma in Computer Science <b>Academic Level 5.0</b>
	O: _____ <b>D</b>	<b>D</b>	Bachelors of Science in Computer Science with minimum CGPA of 7.5 <b>Academic Level 5.5</b>
	O: _____ <b>E</b>	<b>E</b>	Bachelors of Science in Computer Science with minimum CGPA of 7.5 <b>Academic Level 5.5</b>

<b>3</b>	<b>Duration of program</b> R: _____	<b>A</b>	One Year
		<b>B</b>	Two Years
		<b>C</b>	Three Years
		<b>D</b>	Four Years
		<b>E</b>	Four Years
<b>4</b>	<b>Intake Capacity</b> R: _____		
<b>5</b>	<b>Scheme of Examination</b> R: _____	NEP <b>40% Internal</b> <b>60% External</b> , Semester End Examination <b>Individual Passing</b> in Internal and External Examination	
<b>6</b>	<b>Standards of Passing</b> R: _____	<b>40% in each component</b>	
<b>7</b>	<b>Credit Structure</b> Sem. I - R: _____ <b>A</b> Sem. II - R: _____ <b>B</b>	Attached herewith	
	<b>Credit Structure</b> Sem. III - R: _____ <b>C</b> Sem. IV - R: _____ <b>D</b>		
	<b>Credit Structure</b> Sem. V - R: _____ <b>E</b> Sem. VI - R: _____ <b>F</b>		
<b>8</b>	<b>Semesters</b>	<b>A</b>	Sem I & II
		<b>B</b>	Sem III & IV
		<b>C</b>	Sem V & VI
		<b>D</b>	Sem VII & VIII
		<b>E</b>	Sem VII & VIII
<b>9</b>	<b>Program Academic Level</b>	<b>A</b>	4.5
		<b>B</b>	5.0
		<b>C</b>	5.5
		<b>D</b>	6.0
		<b>E</b>	6.0
<b>10</b>	<b>Pattern</b>	Semester	
<b>11</b>	<b>Status</b>	New	
<b>12</b>	<b>To be implemented from Academic Year Progressively</b>	From Academic Year: 2024-25	

*This syllabus is applicable to IDOL students as well, w. e. f. 2025-26.*

**Sign of the BOS Chairman**  
**Dr. Jyotshna Dongardive**  
Ad-hoc BOS (Computer Science)

**Sign of the Offg. Associate Dean**  
**Dr. Madhav R. Rajwade**  
Faculty of Science & Technology

**Sign of Offg. Dean**  
**Prof. Shivram S. Garje**  
Faculty of Science & Technology

# Preamble

## 1) Introduction

In the era of Information and Communication Technology (ICT), the transformative impact of computers on society is undeniable. The pervasive applications of computing across diverse fields have given rise to dynamic industries, evolving in tandem with the swift pace of technological change. As the landscape of the computing field continues to advance, it becomes imperative for students to cultivate a robust foundation that not only facilitates their current skills but also empowers them to adapt to the evolving nature of the field.

In line with the National Education Policy (NEP) 2020, our revised Computer Science program is designed to instill in students the ability to navigate the ever-changing technological terrain. Recognizing that specific languages and platforms may undergo transformations, the curriculum places a strong emphasis on fostering adaptability. Students will not only be exposed to a diverse array of programming languages, tools, paradigms, and technologies but will also delve into the fundamental principles that underpin the realm of computer science.

The core of our program encompasses essential courses such as programming languages, data structures, computer architecture and organization, algorithms, database systems, operating systems, and software engineering. Complementing these foundational elements are specialized courses in areas such as artificial intelligence, computer-based communication networks, distributed computing, information security, graphics, human-computer interaction, multimedia, scientific computing, web technology, and other cutting-edge topics in computer science.

### **Key Philosophy of the Program:**

- **Form Strong Foundations:** Lay the groundwork for a comprehensive understanding of Computer Science.
- **Nurture Skills:** Develop programming, analytical, and design skills to tackle real-world problems effectively.
- **Introduce Gradually:** Familiarize students with emerging trends in a gradual and coherent manner.
- **Prepare for Industry Challenges:** Groom students to meet the challenges of the ICT industry with confidence and competence.

In acknowledgement of the evolving aspirations of students, our program not only prepares them for careers in the industry but also opens doors to research opportunities. The primary goal is to deliver a modern curriculum that equips graduates with both theoretical depth and practical acumen, empowering them to excel in the workplace while fostering a mindset of lifelong learning.

This program not only paves the way for a successful career in the software industry but also inspires students to pursue further studies and research opportunities. Graduates can seamlessly transition into postgraduate programs in Computer Science, leading to research and development roles, employment in IT industries, or even a career in business management.

As we unveil this syllabus, we invite students on a journey of exploration, learning, and innovation, ensuring they are not only prepared for the present but also poised to shape the future of Computer Science.



## 2) Aims and Objectives

**Understanding and Knowledge Base:** Develop a profound understanding and knowledge of the fundamental theories, systems, and applications that form the bedrock of Computer Science. This includes establishing a strong foundation in theoretical concepts and cultivating expertise in the practical application of Computer Science theories.

**Analytical Abilities and Problem Solving:** Foster essential skills and analytical abilities required for devising computer-based solutions to real-life problems. This involves developing critical thinking skills for problem identification and analysis, as well as cultivating the ability to design and implement effective solutions using computational tools.

**Training in Emerging Technologies:** Provide training in emergent computing technologies, facilitating the development of innovative solutions for both industry and academia. This includes exposing students to cutting-edge technologies and their applications, as well as encouraging exploration and experimentation with emerging tools and platforms.

**Preparation for Post-Graduate Studies:** Develop the necessary study skills and knowledge for students to pursue further post-graduate study in Computer Science or related fields. This involves equipping students with the academic rigor required for advanced studies and fostering a passion for continuous learning and research in the field.

**Professional Skillset Development:** Develop the professional skillset required for a successful career in an information technology-oriented business or industry. This includes providing practical exposure to industry-relevant tools and practices, as well as instilling a sense of professional ethics and responsibility.

**Independent and Collaborative Work:** Enable students to work independently and collaboratively, communicate effectively, and become responsible, competent, confident, insightful, and creative users of computing technology. This involves cultivating independence in problem-solving and project execution, as well as enhancing communication and collaboration skills for effective teamwork.



### 3) Learning Outcomes

**At the end of three year Bachelor of Computer Science the students will be able:**

- Formulate, model, and design solutions and procedures, utilizing software tools to address real-world problems effectively.
- Design and develop computer programs and computer-based systems in diverse areas such as networking, web design, security, cloud computing, IoT, data science, and other emerging technologies.
- Familiarize themselves with modern-day trends in industry and research-based settings, fostering the ability to innovate novel solutions to existing problems.
- Apply concepts, principles, and theories related to computer science to new and challenging situations.
- Demonstrate proficiency in using current techniques, skills, and tools essential for computing practice.
- Apply standard Software Engineering practices and strategies in real-time software project development.
- Pursue higher studies of specialization and confidently enter technical employment.
- Work independently or collaboratively as effective team members on substantial software projects, showcasing project management and teamwork skills.
- Communicate and present their work effectively and coherently, both in oral and written formats.
- Display ethical conduct in the usage of the Internet and Cyber systems, understanding and adhering to ethical standards in computing practices.
- Engage in independent and life-long learning, adapting to the rapidly changing IT industry and staying abreast of evolving technologies.

4) Credit Structure of the Program (Sem I, II, III & IV) (Table as per Parishisht 2 with sign of HOD and Dean)

Under Graduate Certificate in Computer Science

R: _____ A										
Level	Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr. / Sem.	Degree/ Cum. Cr.
		Mandatory	Electives							
4.5	I	MJ1: Digital Systems & Architecture (TH) – 2	-	-	2+2	VSC:2 Introduction to Programming with Python – 2	AEC:2, VEC:2, IKS:2	CC:2	22	UG Certificate 44
		MJ2: Fundamentals of Database Systems (TH) – 2				SEC:2 Statistics with R Programming – 2				
		MJP1: Computer Science Practical 1 (PR) – 2				OR Linux Operating System – 2				
	<b>6</b>									
R: _____ B										
4.5	II	MJ3: Design & Analysis of Algorithms (TH) – 2	-	2	2+2	VSC:2 Web Technologies – 2	AEC:2, VEC:2	CC:2	22	UG Certificate 44
		MJ4: Object Oriented Programming (TH) – 2				SEC:2 Database Management Systems using PL/SQL – 2				
		MJP2: Computer Science Practical 2 (PR) – 2				OR Advanced Python Programming – 2				
<b>6</b>										
Cum Cr.		<b>12</b>	-	<b>2</b>	<b>8</b>	<b>4+4</b>	<b>4+4+2</b>	<b>4</b>	<b>44</b>	
Exit option: Award of UG Certificate in Major with 40-44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										

**Under Graduate Diploma in Computer Science**

<b>R: _____ C</b>										
Level	Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr. / Sem.	Degree/ Cum. Cr.
		Mandatory	Electives							
<b>5.0</b>	<b>III</b>	<b>MJ5:</b> Principles of Operating Systems (TH) – 2	-	4	2	<b>VSC:2</b> Java Programming – 2	AEC:2	FP: 2CC:2	22	<b>UG Diploma 88</b>
		<b>MJ6:</b> Theory of Computation (TH) – 2								
		<b>MJ7:</b> Data Structures (TH) – 2								
		<b>MJP3:</b> Computer Science Practical 3 (PR) – 2								
	<b>8</b>									
<b>R: _____ D</b>										
<b>5.0</b>	<b>IV</b>	<b>MJ8:</b> Computer Networks (TH) – 2	-	4	2	<b>SEC:2</b> Mobile Application Development – 2  <b>OR</b> MEAN Stack Development – 2	AEC:2	CEP: 2 CC:2	22	<b>UG Diploma 88</b>
		<b>MJ9:</b> Software Engineering (TH) – 2								
		<b>MJ10:</b> IoT Technologies (TH) – 2								
		<b>MJP4:</b> Computer Science Practical 4 (PR) – 2								
<b>8</b>										
<b>Cum Cr.</b>		<b>28</b>	-	<b>10</b>	<b>12</b>	<b>6+6</b>	<b>8+4+2</b>	<b>8+4</b>	<b>88</b>	
<b>Exit option; Award of UG Diploma in Major and Minor with 80-88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor</b>										

**B.Sc. (Computer Science)**

R: _____ E											
Level	Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr. / Sem.	Degree/ Cum. Cr.	
		Mandatory	Electives								
5.5	V	<b>MJ11:</b> Artificial Intelligence (TH) – 2  <b>MJ12:</b> Cyber & Information Security (TH) – 2  <b>MJ13:</b> Moral & Ehtical AI (TH) – 2  <b>MJP5:</b> Computer Science Practical 5 (PR) – 2  <b>MJP6:</b> Mini Project – I (PR) – 2  <b>10</b>	<b>MJEL1:</b> Software Testing & Quality Assurance (TH) – 2  <b>OR</b> <b>MJEL2:</b> Wireless & Sensor Networks (TH) – 2  <b>MJELP1:</b> Software Testing & Quality Assurance Practical (PR) – 2  <b>OR</b> <b>MJELP2:</b> Wireless & Sensor Networks Practical (PR) – 2  <b>4</b>	4	-	VSC: 2  Ethical Hacking – 2	-	FP/CEP:2	22	UG Degree 132	
	R: _____ F										
	VI	<b>MJ14:</b> Data Science (TH) – 2  <b>MJ15:</b> Cloud Computing (TH) – 2  <b>MJ16:</b> Software Project Management (TH) – 2  <b>MJP7:</b> Computer Science Practical 6 (PR) – 2  <b>MJP8:</b> Mini Project – II (PR) – 2  <b>10</b>	<b>MJEL3:</b> Information Retrieval (TH) – 2  <b>OR</b> <b>MJEL4:</b> Linux Server Administration (TH) – 2  <b>MJELP3:</b> Information Retrieval Practical (PR) – 2  <b>OR</b> <b>MJELP4:</b> Linux Server Administration Practical (PR) – 2  <b>4</b>	4	-	-	-	OJT:4	22		
<b>Cum Cr.</b>		<b>48</b>	<b>8</b>	<b>18</b>	<b>12</b>	<b>8+6</b>	<b>8+4+2</b>	<b>8+6+4</b>	<b>132</b>		
<b>Exit option: Award of UG Degree in Major with 132 credits OR Continue with Major and Minor</b>											

[Abbreviation - OE – Open Electives, VSC – Vocation Skill Course, SEC – Skill Enhancement Course, (VSEC), AEC – Ability Enhancement Course, VEC – Value Education Course, IKS – Indian Knowledge System, OJT – on Job Training, FP – Field Project, CEP – Continuing Education Program, CC – Co-Curricular, RP – Research Project ]

## Semester I

Component	Major		Minor	OE	VSC	SEC	AEC	VEC	IKS	CC	Total
	Mandatory	Electives									
Credits	2+2+2	---	---	2+2	2	2	2	2	2	2	22

Component	Subject	Total Credits
Major	Digital Systems & Architecture	2
Major	Fundamentals of Database Systems	2
Major	Computer Science Practical 1	2
VSC	Introduction to Programming with Python	2
SEC (any one)	Statistics with R Programming	2
	Linux Operating System	

## Semester II

Component	Major		Minor	OE	VSC	SEC	AEC	VEC	IKS	CC2	Total
	Mandatory	Electives									
Credits	2+2+2	---	2	2+2	2	2	2	2	---	2	22

Component	Subject	Total Credits
Major	Design & Analysis of Algorithms	2
Major	Object Oriented Programming using C++	2
Major	Computer Science Practical 2	2
VSC	Web Technologies	2
SEC (any one)	Database Management Systems using PL/SQL	2
	Advanced Python Programming	

**Sem – II**

## Name of the Course: Design and Analysis of Algorithms

Sr. No.	Heading	Particulars
1	Description the course:	<p><b>Introduction:</b></p> <p>The Design and Analysis of Algorithms course is a fundamental exploration into the systematic study of algorithms, their design principles, and the analysis of their efficiency. It forms the backbone of computer science education, providing essential skills for solving complex computational problems.</p> <p><b>Relevance:</b></p> <p>In the ever-evolving landscape of computer science, the Design and Analysis of Algorithms course is highly relevant. It equips students with the intellectual tools necessary to address challenges in diverse areas, from software development to artificial intelligence.</p> <p><b>Usefulness:</b></p> <p>This course is instrumental in cultivating algorithmic thinking. Participants learn to devise efficient algorithms, analyze their correctness, and evaluate their performance, essential skills for creating optimized solutions in various computing applications.</p> <p><b>Application:</b></p> <p>The knowledge gained from this course finds application in a myriad of scenarios, from developing efficient search and sorting algorithms to optimizing resource utilization in network design and artificial intelligence.</p> <p><b>Interest:</b></p> <p>The course often captivates students due to its intellectual challenges and problem-solving nature. Participants engage in dissecting complex problems, devising algorithmic solutions, and analyzing their efficiency, fostering a deep appreciation for algorithmic thinking.</p> <p><b>Connection with Other Courses:</b></p> <p>The Design and Analysis of Algorithms course establishes vital connections with other computer science disciplines. It forms the basis for advanced courses in data structures, algorithmic complexity, and computational theory, providing a holistic understanding of computation.</p>



		<p><b>Demand in the Industry:</b></p> <p>Professionals well-versed in algorithm design and analysis are in high demand. Industries ranging from technology and finance to healthcare actively seek individuals who can develop efficient algorithms to solve complex problems and enhance system performance.</p> <p><b>Job Prospects:</b></p> <p>Graduates from a Design and Analysis of Algorithms course find themselves well-positioned for various roles, including software engineer, algorithm developer, data scientist, and research scientist. These professionals are valued for their ability to devise elegant and efficient solutions to computational challenges.</p>
2	<b>Vertical:</b>	Major
3	<b>Type:</b>	Theory
4	<b>Credits:</b>	2 credits ( 1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester )
5	<b>Hours Allotted:</b>	30 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<p><b>Course Objectives(CO):</b></p> <p><b>CO 1.</b> To make students understand the basic principles of algorithm design</p> <p><b>CO 2.</b> To give idea to students about the theoretical background of the basic data structures</p> <p><b>CO 3.</b> To familiarize the students with fundamental problem-solving strategies like searching, sorting, selection, and recursion and help them to evaluate efficiencies of various algorithms.</p> <p><b>CO 4.</b> To teach students the important algorithm design paradigms and how they can be used to solve various real world problems</p>	
8	<p><b>Course Outcomes (OC):</b></p> <p><b>OC 1.</b> Students should be able to understand and evaluate efficiency of the programs that they write based on performance of the algorithms used.</p> <p><b>OC 2.</b> Students should be able to appreciate the use of various data structures as per need</p> <p><b>OC 3.</b> To select, decide and apply appropriate design principle by understanding the requirements of any real life problems.</p>	
9	<p><b>Modules:-</b></p> <p><b>Module 1 (15 hours):</b></p> <p><b>Introduction to algorithms</b> - What is algorithm, analysis of algorithm, Types of complexity, Running time analysis, How to Compare Algorithms, Rate of Growth, Types of Analysis, Asymptotic Notation, Big-O Notation, Omega-<math>\Omega</math> Notation, Theta-<math>\Theta</math> Notation, Asymptotic Analysis, Performance characteristics of algorithms,</p>	

	<p>Estimating running time / number of steps of executions on paper, Idea of Computability</p> <p><b>Introduction to Data Structures</b> - What is data structure, types, Introduction to Array(1-d &amp; 2-d), Stack and List data structures, operations on these data structures, advantages disadvantages and applications of these data structures like solving linear equations, Polynomial Representation, Infix-to-Postfix conversion.</p> <p><b>Recursion</b> - What is recursion, Recursion vs Iteration, recursion applications like Factorial of a number, Fibonacci series &amp; their comparative analysis with respect to iterative version, Tower of Hanoi problem.</p> <p><b>Basic Sorting Techniques</b> - Bubble, Selection and Insertion Sort &amp; their comparative analysis</p> <hr/> <p><b>Module 2 (15 hours):</b></p> <p><b>Searching Techniques</b> - Linear Search and its types, Binary Search and their comparative analysis, Selection Techniques - Selection by Sorting, Partition-based Selection Algorithm, Finding the Kth Smallest Elements in Sorted Order &amp; their comparative analysis, String Algorithms - Pattern matching in strings, Brute Force Method &amp; their comparative analysis</p> <p><b>Algorithm Design Techniques</b> - Introduction to various types of classifications/design criteria and design techniques, Greedy Technique - Concept, Advantages &amp; Disadvantages, Applications, Implementation using problems like - file merging problem. Divide-n-Conquer - Concept, Advantages &amp; Disadvantages, Applications, Implementation using problems like - merge sort, Strassen's Matrix Multiplication</p> <p><b>Dynamic Programming</b> - Concept, Advantages &amp; Disadvantages, Applications, Implementation using problems like - Fibonacci series, Factorial of a number, Longest Common subsequence</p> <p><b>Backtracking Programming</b> - Concept, Advantages &amp; Disadvantages, Applications, Implementation using problems like N-Queen Problem</p>
10	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Data Structure and Algorithm Using Python, Rance D. Ncaise, Wiley India Edition, 2016.</li> <li>2. Data Structures and Algorithms Made Easy, Narasimha Karumanchi, CareerMonk Publications, 2016.</li> <li>3. Introduction to Algorithms, Thomas H. Cormen, 3rd Edition, PHI.</li> </ol>
11	<p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson, 3rd Edition, 2011.</li> <li>2. Design and Analysis of Algorithms, S. Sridhar, Oxford University Press, 2014.</li> </ol>

<b>12</b>	<b>Internal Continuous Assessment: 40%</b>	<b>Semester End Examination: 60%</b>																
<b>13</b>	<b>Continuous Evaluation through:</b> Class Test on Module 1: 10 marks Class Test on Module 2: 10 marks <hr/> <b>Average of 2 Class Tests: 10 marks</b> Assignment on Module 1: 5 marks Assignment on Module 2: 5 marks <hr/> <b>Total of 2 Assignments: 10 marks</b> <b>Total: 20 marks</b>	<b>Evaluation through:</b> A <b>Semester End Theory Examination of 1 hour duration</b> for <b>30 marks</b> as per the paper pattern given below. <hr/> <b>Total: 30 marks</b>																
<b>14</b>	<b>Format of Question Paper:</b>  <b>Total Marks: 30</b> <span style="float: right;"><b>Duration: 1 Hour</b></span> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Question</th> <th style="width: 25%;">Based On</th> <th style="width: 40%;">Options</th> <th style="width: 10%;">Marks</th> </tr> </thead> <tbody> <tr> <td><b>Q. 1</b></td> <td>Module 1</td> <td><i>Any 2 out of 4</i></td> <td>10</td> </tr> <tr> <td><b>Q. 2</b></td> <td>Module 2</td> <td><i>Any 2 out of 4</i></td> <td>10</td> </tr> <tr> <td><b>Q. 3</b></td> <td>Module 1 &amp; 2</td> <td><i>Any 2 out of 4</i></td> <td>10</td> </tr> </tbody> </table>		Question	Based On	Options	Marks	<b>Q. 1</b>	Module 1	<i>Any 2 out of 4</i>	10	<b>Q. 2</b>	Module 2	<i>Any 2 out of 4</i>	10	<b>Q. 3</b>	Module 1 & 2	<i>Any 2 out of 4</i>	10
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<b>Q. 3</b>	Module 1 & 2	<i>Any 2 out of 4</i>	10															

## Name of the Course: Introduction to OOP using C++

Sr. No.	Heading	Particulars
1	Description the course:	<p><b>Introduction:</b></p> <p>The Introduction to Object-Oriented Programming (OOP) using C++ course is a foundational exploration into the principles of object-oriented programming, using the C++ programming language. This course serves as a gateway for students to understand and apply key concepts in software design and development.</p> <p><b>Relevance:</b></p> <p>In the contemporary software development landscape, understanding OOP principles is crucial. The C++ language, with its strong support for object-oriented features, is widely used in building robust and efficient software systems. This course is, therefore, highly relevant to the needs of modern programming.</p> <p><b>Usefulness:</b></p> <p>The course is instrumental in imparting essential programming paradigms such as encapsulation, inheritance, and polymorphism. Participants gain valuable skills in designing modular and reusable code, contributing to the creation of scalable and maintainable software solutions.</p> <p><b>Application:</b></p> <p>The concepts learned in this course find direct application in software development. Participants learn to structure code using classes and objects, facilitating the creation of efficient and well-organized programs.</p> <p><b>Interest:</b></p> <p>The course often captivates students due to its practical and creative aspects. Through hands-on projects, participants engage in designing and implementing solutions using OOP principles, fostering a deep interest in software design and development.</p> <p><b>Connection with Other Courses:</b></p> <p>This course establishes strong connections with other programming and software engineering courses. It lays the groundwork for advanced studies in software architecture, design patterns, and application development, providing a seamless transition to more</p>

		<p>complex programming concepts.</p> <p><b>Demand in the Industry:</b></p> <p>Professionals with a solid understanding of OOP using C++ are in high demand. Industries ranging from software development to embedded systems actively seek individuals who can leverage OOP principles to create efficient, modular, and maintainable code.</p> <p><b>Job Prospects:</b></p> <p>Students completing this course may find diverse job prospects. Roles may include software developer, systems analyst, application architect, and embedded systems engineer. These professionals are valued for their ability to contribute to the creation of robust and scalable software solutions.</p>
2	<b>Vertical:</b>	Major
3	<b>Type:</b>	Theory
4	<b>Credits:</b>	2 credits ( 1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester )
5	<b>Hours Allotted:</b>	30 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<p><b>Course Objectives(CO):</b></p> <p><b>CO 1.</b> To make learner understand the concepts of OOP</p> <p><b>CO 2.</b> To make learner understand the design of OOP through UML</p> <p><b>CO 3.</b> To make learner familiar with the syntax of C++</p> <p><b>CO 4.</b> To make learner Analyze and implement concepts of OOP</p> <p><b>CO 5.</b> To make learner create programs relating to OOP concepts</p>	
8	<p><b>Course Outcomes (OC):</b></p> <p><b>OC 1.</b> The learner will be able to understand, remember, demonstrate, explain and describe concept of OOP</p> <p><b>OC 2.</b> The learner will be able to design UML based diagrams</p> <p><b>OC 3.</b> The learner will be able to illustrate the different types of control statements in C++</p> <p><b>OC 4.</b> The learner will be able to analyze and implement concept of OOP</p> <p><b>OC 5.</b> The learner will be able to write and create programs relating to OOP concepts</p>	
9	<p><b>Modules:-</b></p> <p><b>Module 1 (15 hours):</b></p> <p><b>Introduction to Programming Concepts:</b> Object oriented programming paradigm, basic concepts of object oriented programming, benefits of object oriented programming, object oriented languages, applications of object oriented programming. Tokens-keywords, identifiers, constants-integer, real, character and string constants, backslash constants, features of C++ and its basic structure, simple</p>	

	<p>C++ program without class, compiling and running C++ program.</p> <p><b>Data Types, Data Input Output and Operators:</b> Basic data types, variables, rules for naming variables, programming constants, the type cast operator, implicit and explicit type casting, cout and cin statements, operators, precedence of operators.</p> <p><b>Decision Making, Loops, Arrays and Strings:</b> Conditional statements-if,if...else, switch loops- while, do...while, for, types of arrays and string and string manipulations</p> <p><b>Unified Modeling Language (UML):</b> Introduction to UML &amp; class diagrams.</p> <p><b>Classes, Abstraction &amp; Encapsulation:</b> Classes and objects, Dot Operator, data members, member functions, passing data to functions, scope and visibility of variables in function.</p> <p><b>Constructors and Destructors:</b> Default constructor, parameterized constructor, copy constructor, private constructor, destructors.</p> <p><b>Working with objects:</b> Accessor - mutator methods, static data and static function, access specifiers, array of objects.</p>
	<p><b>Module 2 (15 hours):</b></p> <p><b>Polymorphism -</b> Binding-static binding &amp; overloading, constructor overloading function overloading, operator overloading, overloading unary and binary operators.</p> <p><b>Modelling Relationships in Class Diagrams:</b> Association, Aggregation-Composition and examples covering these principles</p> <p><b>Inheritance:</b> Defining base class and its derived class, access specifiers, types of inheritance-single, multiple, hierarchical, multilevel, hybrid inheritance, friend function and friend class, constructors in derived classes.</p> <p><b>Modelling Relationships:</b> Generalization-Specialization and examples covering these principles</p> <p><b>Run time Polymorphism -</b> Dynamic Binding, Function overriding, virtual function, pure virtual function, virtual base class, abstract class.</p> <p><b>Pointers:</b> Introduction to pointers, * and &amp; operators, assigning addresses to pointer variables, accessing values using pointers, pointers to objects &amp; this pointer, pointers to derived classes</p> <p><b>File Handling:</b> File Stream classes, opening and closing file-file opening modes, text file handling, binary file handling.</p> <p><b>Applying OOP to solve real life applications:</b> To cover case studies like library management, order management etc. to design classes covering all relationships</p>
<p><b>10</b></p>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Object Oriented Programming with C++, Balagurusamy E., 8th Edition, McGraw Hill Education India.</li> <li>2. UML &amp; C++: A Practical Guide to Object Oriented Development, Lee/Tepfenhart, Pearson Education, 2nd Edition 2015</li> </ol>

<b>11</b>	<b>Reference Books</b> 1. Mastering C++ by Venugopal, Publisher: McGraw-Hill Education, 2017 2. Let Us C++ by KanetkarYashwant, Publisher: BPB Publications, 2020 3. Object Oriented Analysis and Design by Timothy Budd TMH, 2001																		
<b>12</b>	<b>Internal Continuous Assessment: 40%</b>	<b>Semester End Examination: 60%</b>																	
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## Name of the Course: Computer Science Practical 2

Sr. No.	Heading	Particulars
1	Description the course:	<p><b>Introduction:</b> The Computer Science Practical Course covering Design and Analysis of Algorithms and Object-Oriented Programming (OOP) using C++ is a comprehensive exploration into fundamental computer science concepts and practical programming skills. It integrates the study of algorithmic design with hands-on application using the C++ programming language.</p> <p><b>Relevance:</b> In the dynamic field of computer science, the integration of algorithmic design and object-oriented programming is highly relevant. This course equips students with essential skills to solve complex problems, design efficient algorithms, and implement practical solutions using the OOP paradigm in C++.</p> <p><b>Usefulness:</b> The course is invaluable for developing a strong foundation in algorithmic thinking and software design. Students learn to analyze algorithm efficiency, apply OOP principles for code modularity, and create robust software solutions, enhancing their overall programming proficiency.</p> <p><b>Application:</b> The concepts acquired in this practical course find direct application in real-world scenarios. Students engage in hands-on projects where they design and implement algorithms, analyze their performance, and develop software applications using object-oriented principles in C++.</p> <p><b>Interest:</b> The practical nature of the course often captivates students. Through project-based learning, participants apply algorithmic strategies, design class hierarchies, and implement solutions in C++, fostering a deep interest in problem-solving and software development.</p> <p><b>Connection with Other Courses:</b> This practical course establishes a strong connection with other computer science courses. It lays the groundwork for advanced studies in algorithmic complexity, data structures, software engineering, and advanced topics in object-oriented programming, providing a well-rounded education.</p>

		<p><b>Demand in the Industry:</b> Professionals with proficiency in algorithmic design and object-oriented programming in C++ are in high demand. Industries spanning software development, technology, and finance actively seek individuals who can apply these skills to create efficient and scalable software solutions.</p> <p><b>Job Prospects:</b> Graduates from this practical course have diverse job prospects. Roles may include software engineer, algorithm developer, systems analyst, or application developer. These professionals are valued for their ability to contribute to algorithmically optimized, modular, and maintainable software.</p>
2	<b>Vertical:</b>	Major
3	<b>Type:</b>	Practical
4	<b>Credits:</b>	2 credits ( 1 credit = 30 Hours of Practical work in a semester )
5	<b>Hours Allotted:</b>	60 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<p><b>Course Objectives(CO):</b>  <b>CO 1.</b> Analyze and implement algorithms for common computational problems.  <b>CO 2.</b> Implement algorithms using divide and conquer strategies.  <b>CO 3.</b> Apply dynamic programming techniques to solve optimization problems.  <b>CO 4.</b> Implement and analyze algorithms based on greedy strategies.  <b>CO 5.</b> Comprehend the principles of object-oriented programming.  <b>CO 6.</b> Design and implement classes and objects in C++.  <b>CO 7.</b> Implement single, multiple, and hierarchical inheritance.  <b>CO 8.</b> Implement operator overloading for user-defined types.  <b>CO 9.</b> Understand the impact of access specifiers on class members.</p>	
8	<p><b>Course Outcomes (OC):</b>  <b>OC 1.</b> Design and implement algorithms for various problem domains.  <b>OC 2.</b> Evaluate and compare the time and space complexities of algorithms.  <b>OC 3.</b> Apply divide and conquer strategies to solve computational problems.  <b>OC 4.</b> Utilize dynamic programming techniques for optimization problems.  <b>OC 5.</b> Implement and analyze algorithms based on greedy strategies.  <b>OC 6.</b> Design and implement classes and objects in C++.  <b>OC 7.</b> Apply inheritance and polymorphism concepts in program development.  <b>OC 8.</b> Implement operator overloading for enhanced class functionality.  <b>OC 9.</b> Utilize advanced features like friend functions, inline functions, and this pointer.  <b>OC 10.</b> Understand the impact of scope specifiers on class members.</p>	

9

**Modules:-**

**Module 1 (30 hours):**

**Design & Analysis of Algorithms – Practical**

**Array Operations:**

Implement programs for 1-d arrays, Implement programs for 2-d arrays.

**List-Based Stack Operations:**

Create a list-based stack and perform stack operations.

**Linear and Binary Search:**

Implement linear and binary search algorithms on a list.

**Sorting Algorithms:**

Implement sorting algorithms (e.g., bubble, selection, insertion).

**Nth Max/Min Element:**

Implement algorithms to find Nth Max/Min element in a list.

**String Pattern Matching:**

Implement algorithms to find a pattern in a given string.

**Recursion:**

Implement recursive algorithms (e.g., factorial, Fibonacci, Tower of Hanoi).

**Greedy Algorithm:**

Solve problems like file merging and coin change using the Greedy Algorithm.

**Divide and Conquer:**

Implement algorithms like merge sort and Strassen's Matrix Multiplication.

**Dynamic Programming:**

Implement algorithms for Fibonacci series and Longest Common Subsequence using dynamic programming.

**Module 2 (30 hours):**

**OOPs using C++ – Practical**

**Introduction to Classes:**

Create a simple class with data members and member functions.

Demonstrate the use of class instances to access data and invoke member functions.

**Branching and Looping with Classes:**

Implement programs utilizing branching and looping statements within class methods.

**Arrays and Classes:**

	<p>Develop a program that employs one and two-dimensional arrays within a class. Illustrate how classes can handle array-based data structures.</p> <p><b>Scope Resolution Operator:</b></p> <p>Use the scope resolution operator to declare variables at different scope levels. Display and compare the values of variables with different scopes.</p> <p><b>Constructors and Destructors:</b></p> <p>Implement programs showcasing various types of constructors and destructors. Explore default, parameterized, copy constructors, and destructor functionalities.</p> <p><b>Access Specifiers:</b></p> <p>Demonstrate the use of public, protected, and private scope specifiers within a class. Understand the impact of different access specifiers on class members.</p> <p><b>Inheritance:</b></p> <p>Implement classes to demonstrate single and multilevel inheritance scenarios. Showcase how derived classes inherit properties from the base class. Develop programs illustrating multiple and hierarchical inheritance. Create programs that demonstrate the interaction between inheritance and derived class constructors. Understand the order of constructor invocation in the inheritance hierarchy.</p> <p><b>Advanced Concepts:</b></p> <p>Implement programs showcasing friend functions, inline functions, and the use of the this pointer within classes.</p> <p><b>Function Overloading and Overriding:</b></p> <p>Develop programs to demonstrate function overloading and overriding within classes.</p> <p><b>Pointers and File Handling:</b></p> <p>Explore the use of pointers within classes, emphasizing dynamic memory allocation. Develop programs for both text and binary file handling within a class context.</p>
<p><b>10</b></p>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Data Structure and Algorithm Using Python, Rance D. Necaie, Wiley India Edition, 2016.</li> <li>2. Object Oriented Programming with C++, Balagurusamy E., 8th Edition, McGraw Hill Education India.</li> </ol>

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<b>13</b>	The internal evaluation will be determined by the completion of practical tasks and the submission of corresponding write-ups for each session. Each practical exercise holds a maximum value of 5 marks. The total evaluation, out of 100 marks, should be scaled down to a final score of 20 marks.  <hr/> <b>Total: 20 marks</b>	<b>A Semester End Practical Examination of 2 hours duration for 30 marks</b> as per the paper pattern given below.  <b>Certified Journal is compulsory</b> for appearing at the time of Practical Exam  <hr/> <b>Total: 30 Marks</b>															
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Q. 3	Viva	06															

## Name of the Course: Web Technologies

Sr. No.	Heading	Particulars
1	<b>Description the course:</b>	<p><b>Introduction:</b></p> <p>The Web Technologies Course is an immersive exploration into the core technologies that drive the visual and interactive aspects of the web. Covering HTML, CSS, Javascript, XML, and PHP, this course equips individuals with the skills needed to create dynamic and aesthetically pleasing websites.</p> <p><b>Relevance:</b></p> <p>In the digital age, web design is paramount. The course remains highly relevant as it introduces participants to the fundamental languages and technologies that form the backbone of modern web development.</p> <p><b>Usefulness:</b></p> <p>The course is invaluable for anyone interested in creating responsive, user-friendly, and visually appealing websites. Participants gain practical skills in structuring web content, styling layouts, and implementing interactive features.</p> <p><b>Application:</b></p> <p>The concepts learned in this course find direct application in real-world web development projects. Participants design and build websites, applying HTML for structure, CSS for styling, Javascript for interactivity, XML for data representation, and PHP for server-side scripting.</p> <p><b>Interest:</b></p> <p>The creative and hands-on nature of web design often captivates students. Through practical exercises, participants engage in designing and developing websites, fostering a deep interest in creating visually engaging online experiences.</p> <p><b>Connection with Other Courses:</b></p> <p>This course establishes strong connections with various other courses in the field of web development and computer science. It provides a foundation for advanced studies in full-stack development, database management, and server-side scripting.</p>

		<p><b>Demand in the Industry:</b></p> <p>Professionals with strong web designing skills are in high demand. Industries spanning e-commerce, technology, and media actively seek individuals who can create user-friendly and visually appealing websites to enhance online presence and user engagement.</p> <p><b>Job Prospects:</b></p> <p>Graduates from a Web Designing Course find diverse job prospects. Roles may include web designer, front-end developer, UI/UX designer, and web content manager. These professionals are sought after for their ability to create visually stunning and functional web interfaces.</p>
2	<b>Vertical:</b>	VSC
3	<b>Type:</b>	Practical
4	<b>Credits:</b>	2 credits ( 1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester )
5	<b>Hours Allotted:</b>	60 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<p><b>Course Objectives(CO):</b></p> <p><b>CO 1.</b> To understand the concept of Web Technologies</p> <p><b>CO 2.</b> To understand the concepts of Hyper Text Markup Language and Cascading Style Sheets.</p> <p><b>CO 3.</b> To learn JavaScript for creating dynamic websites.</p> <p><b>CO 4.</b> To learn various operations performed on data among web applications using XML</p> <p><b>CO 5.</b> To learn Server-Side Programming using PHP</p>	
8	<p><b>Course Outcomes (OC):</b></p> <p><b>OC 1.</b> Design valid, well-formed, scalable, and meaningful pages using emerging technologies.</p> <p><b>OC 2.</b> Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites</p> <p><b>OC 3.</b> Develop and implement client-side and server-side scripting language programs.</p> <p><b>OC 4.</b> Develop and implement Database Driven Websites.</p> <p><b>OC 5.</b> Design and apply XML to create a markup language for data and document centric applications.</p>	
9	<p><b>Modules:-</b></p> <p><b>Module 1 (30 hours):</b></p> <p><b>HTML:</b> Fundamental Elements of HTML, Formatting Text in HTML, Organizing Text in HTML, List Tags, Links and URLs in HTML, Tables in HTML, Images on a Web Page, Image Formats, Image Maps, Colors, Navigation across multiple pages, Forms in HTML, Interactive Elements, Working with Multimedia - Audio and Video File Formats, HTML elements for inserting Audio / Video on a web page</p>	



	<p><b>CSS:</b> Understanding the Syntax of CSS, CSS Selectors, Inserting CSS in an HTML Document, CSS properties to work with background of a Page, CSS properties to work with Fonts and Text Styles, CSS properties for positioning an element.</p> <p><b>JavaScript:</b> Using JavaScript in an HTML Document, Programming, Fundamentals of JavaScript – Variables, Operators, Control Flow Statements, Popup Boxes, Functions – Defining and Invoking a Function, Defining Function arguments, defining a return Statement, Calling Functions with Timer, JavaScript Objects - String, RegExp, Math, Date, Browser Objects - Window, Navigator, History, Location, Document, Cookies, Document Object Model, Form Validation using JavaScript</p>	
	<b>Module 2 (30 hours):</b>	
	<p><b>XML:</b> Comparing XML with HTML, Advantages and Disadvantages of XML, Structure of an XML Document, XML Entity References, with Internal / External DTD, XSLT Elements and Attributes</p> <p><b>AJAX:</b> AJAX Web Application Model, How AJAX Works, XMLHttpRequest Object – Properties and Methods, Handling asynchronous requests using AJAX e.g. Mouseover, button click,</p> <p><b>PHP:</b> Variables and Operators, Retrieving data from HTML forms, Program Flow, Arrays, working with Files and Directories, working with Databases, Working with Cookies, Sessions, and Headers</p>	
<b>10</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed, Dreamtech Press, 2016</li> <li>2. Web Programming and Interactive Technologies, scriptDemics, StarEdu Solutions India, 2018</li> <li>3. PHP: A Beginners Guide, Vikram Vaswani, TMH</li> </ol>	
<b>11</b>	<p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. HTML, XHTML, and CSS Bible Fifth Edition, Steven M. Schafer, WILEY, 2011</li> <li>2. Learning PHP, MySQL, JavaScript, CSS &amp; HTML5, Robin Nixon, O'Reilly, 2018</li> <li>3. PHP, MySQL, JavaScript &amp; HTML5 All-in-one for Dummies, Steve Suehring, Janet Valade Wiley, 2018</li> </ol>	
<b>12</b>	<b>Internal Continuous Assessment: 40%</b>	<b>Semester End Examination: 60%</b>
<b>13</b>	<p>The internal evaluation will be determined by the completion of practical tasks and the submission of corresponding write-ups for each session. Each practical exercise holds a maximum value of 5 marks. The total evaluation, out of 50 marks, should be scaled down to a final score of 20 marks.</p> <hr/> <p><b>Total: 20 marks</b></p>	<p><b>A Semester End Practical Examination of 2 hours duration for 30 marks</b> as per the paper pattern given below.</p> <p><b>Certified Journal is compulsory</b> for appearing at the time of Practical Exam</p> <hr/> <p><b>Total: 30 Marks</b></p>

**14**

**Format of Question Paper:**

**Total Marks: 30**

**Duration: 2 Hours**

<b>Question</b>	<b>Practical Question Based On</b>	<b>Marks</b>
<b>Q. 1</b>	Module 1	12
<b>Q. 2</b>	Module 2	12
<b>Q. 3</b>	Viva	06

## Name of the Course: Database Management Systems Using PL/SQL

Sr. No.	Heading	Particulars
1	Description the course:	<p><b>Introduction:</b></p> <p>The Database Management Systems (DBMS) Using PL/SQL course is a comprehensive exploration into the principles and practices of managing databases using the powerful PL/SQL language. This course provides participants with the skills needed to design, implement, and maintain robust database systems.</p> <p><b>Relevance:</b></p> <p>In the era of information technology, databases serve as the backbone of applications. The course is highly relevant as it delves into PL/SQL, a procedural language designed for seamless interaction with Oracle databases, one of the most widely used database management systems.</p> <p><b>Usefulness:</b></p> <p>The course is invaluable for individuals seeking proficiency in database management. Participants learn to harness the capabilities of PL/SQL for efficient data storage, retrieval, and manipulation, enhancing the functionality and performance of database systems.</p> <p><b>Application:</b></p> <p>The concepts learned in this course find direct application in real-world scenarios. Participants design and implement database structures, write PL/SQL scripts for data manipulation, and optimize database performance, ensuring the efficient operation of data-centric applications.</p> <p><b>Interest:</b></p> <p>The hands-on and problem-solving nature of working with databases and PL/SQL often captivates students. Through practical exercises, participants engage in creating and managing databases, fostering a deep interest in efficient data storage and retrieval.</p> <p><b>Connection with Other Courses:</b></p> <p>This course establishes strong connections with other courses in the field of database management, data analytics, and software development. It provides a foundation for advanced studies in database optimization,</p>

		<p>data warehousing, and application development.</p> <p><b>Demand in the Industry:</b></p> <p>Professionals proficient in database management using PL/SQL are in high demand. Industries spanning finance, healthcare, and e-commerce actively seek individuals who can design and manage databases to ensure data integrity, security, and optimal performance.</p> <p><b>Job Prospects:</b></p> <p>Graduates from a DBMS Using PL/SQL course find diverse job prospects. Roles may include database administrator, SQL developer, data analyst, and database architect. These professionals are valued for their ability to create and manage databases critical to organizational success.</p>
2	<b>Vertical:</b>	SEC
3	<b>Type:</b>	Practical
4	<b>Credits:</b>	2 credits ( 1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester )
5	<b>Hours Allotted:</b>	60 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<p><b>Course Objectives(CO):</b></p> <p><b>CO 1.</b> To develop understanding of concepts and techniques for data management</p> <p><b>CO 2.</b> To learn about widely used systems for implementation and usage</p> <p><b>CO 3.</b> To develop understanding of Transaction management and crash recovery.</p>	
8	<p><b>Course Outcomes (OC):</b></p> <p><b>OC 1.</b> Master concepts of stored procedure, functions, cursors and triggers and its use.</p> <p><b>OC 2.</b> Learn about using PL/SQL for data management.</p> <p><b>OC 3.</b> Use efficiently Collections and records.</p> <p><b>OC 4.</b> Understand concepts and implementations of transaction management and crash recovery.</p>	
9	<p><b>Modules:-</b></p> <p><b>Module 1 (30 hours):</b></p> <p><b>Overview of PL/SQL:</b> Advantages of PL/SQL, Main Features of PL/SQL, Architecture of PL/SQL</p> <p><b>Fundamentals of PL/SQL:</b> Character Sets, Lexical Units, Declarations, References to Identifiers, Scope and Visibility of Identifiers, Assigning Values to Variables, Expressions, Error-Reporting Functions, Data Types., Control Statements: Conditional Selection Statements, LOOP Statements, Sequential Control Statements, GOTO, and NULL Statements.</p>	

	<p><b>Sequences:</b> creating sequences, referencing, altering, and dropping a sequence.</p> <p><b>Stored Procedures and Functions:</b> Procedures: Types and benefits of stored procedures, creating stored procedures, executing stored procedures, altering stored procedures, viewing stored procedures. Functions: Calling function and recursion function.</p> <p><b>Collections and Records:</b> Associative Arrays, Varrays (Variable-Size Arrays), Nested Tables, Collection Constructors, Assigning Values to Collection Variables, Multidimensional Collections, Collection Comparisons, Collection Methods, Collection Types Defined in Package Specifications, Record Variables, Assigning Values to Record Variables.</p> <p><b>Error Handling:</b> Compile-Time Warnings, Overview of Exception Handling, Internally Defined Exceptions, Predefined Exceptions, User- Defined Exceptions, Redeclared Predefined Exceptions, Raising Exceptions Explicitly, Exception Propagation, Unhandled Exceptions.</p> <hr/> <p><b>Module 2 (30 hours):</b></p> <p><b>Cursors:</b> Overview of Cursor, Types of cursors, Invalid cursor Exception.</p> <p><b>Static SQL:</b> Description of Static SQL, Cursors Overview, Processing Query Result Sets, Cursor Variables, CURSOR Expressions,</p> <p><b>Transaction Processing and Control:</b> Autonomous Transactions, Commit Protocol, Concurrency Control, Lock Management, Read-Write Locks, Deadlocks Handling,</p> <p><b>Dynamic SQL:</b> Native Dynamic SQL, DBMS_SQL Package, SQL Injection.</p> <p><b>Triggers:</b> Overview of Triggers, implementing triggers – creating triggers, Insert, delete, and update triggers, nested triggers, viewing, deleting, and modifying triggers, enforcing data integrity through triggers.</p> <p><b>Packages:</b> Overview of a Package. Need of Packages, Package Specification, Package Body, Package Instantiation, and Initialization. Create nested tables and work with nested tables.</p>
<p><b>10</b></p>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Mastering PL/SQL Through Illustrations: From Learning Fundamentals to Developing Efficient PL/SQL Blocks, Dr. B. Chandra, BPB Publication, 2020</li> <li>2. Oracle PL/SQL Training Guide., Training guide, BPB Publications, 2016</li> <li>3. Raghu Ramakrishnam, Gehrke, Database Management Systems, McGraw-Hill,3rd Edition, 2014</li> <li>4. Abraham Silberschatz, Henry F. Korth,S. Sudarshan , Database System Concepts, 6th Edition 2019</li> </ol>
<p><b>11</b></p>	<p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Ivan Bayross, SQL, PL/SQL -The Programming language of Oracle, B.P.B. Publications 2009</li> <li>2. Ramez Elmasri &amp; Shamkant B.Navathe, Fundamentals of Database Systems, Pearson Education, 2008</li> </ol>

<b>12</b>	<b>Internal Continuous Assessment: 40%</b>	<b>Semester End Examination: 60%</b>												
<b>13</b>	The internal evaluation will be determined by the completion of practical tasks and the submission of corresponding write-ups for each session. Each practical exercise holds a maximum value of 5 marks. The total evaluation, out of 50 marks, should be scaled down to a final score of 20 marks. <hr/> <b>Total: 20 marks</b>	A <b>Semester End Practical Examination</b> of <b>2 hours duration</b> for <b>30 marks</b> as per the paper pattern given below.  <b>Certified Journal</b> is <b>compulsory</b> for appearing at the time of Practical Exam <hr/> <b>Total: 30 Marks</b>												
<b>14</b>	<b>Format of Question Paper:</b>  <b>Total Marks: 30</b> <span style="float: right;"><b>Duration: 2 Hours</b></span>													
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<b>Q. 1</b>	Module 1	12												
<b>Q. 2</b>	Module 2	12												
<b>Q. 3</b>	Viva	06												

## Name of the Course: Advanced Python Programming

Sr. No.	Heading	Particulars
1	Description the course:	<p><b>Introduction:</b></p> <p>The Advanced Python Programming Course is designed to elevate coding skills to a more sophisticated level, offering participants a deeper understanding of Python's advanced features and capabilities. Building upon the foundations laid in basic Python courses, this advanced course delves into complex programming concepts and techniques.</p> <p><b>Relevance:</b></p> <p>As technology advances, the relevance of Python continues to grow. The Advanced Python Programming Course is a response to the increasing demand for skilled Python developers who can tackle intricate challenges in various domains, including software development, data science, artificial intelligence, and more.</p> <p><b>Usefulness:</b></p> <p>This course goes beyond basic syntax and introduces participants to advanced Python topics such as decorators, generators, metaclasses, and asynchronous programming. Learners gain valuable insights into optimizing code performance, enhancing code readability, and solving complex problems efficiently.</p> <p><b>Application:</b></p> <p>Graduates of this course can apply their advanced Python skills to tackle more complex programming tasks, develop scalable applications, and contribute to large-scale software projects. The course's emphasis on practical applications ensures that participants are well-equipped for real-world programming challenges.</p> <p><b>Interest:</b></p> <p>The course maintains an engaging learning experience, balancing theoretical concepts with hands-on projects that challenge participants to apply their knowledge creatively. This approach fosters a continued interest in Python programming and encourages learners to explore advanced topics with enthusiasm.</p> <p><b>Connection with Other Courses:</b></p> <p>The knowledge gained in the Advanced Python</p>



		<p>Programming Course establishes a strong foundation for further specialization in advanced Python libraries, frameworks, and application domains. This course acts as a bridge to more specialized fields such as machine learning, web development, and data engineering.</p> <p><b>Demand in the Industry:</b></p> <p>Professionals with advanced Python skills are highly sought after in the industry. The ability to leverage Python's advanced features for efficient problem-solving, code optimization, and system architecture places graduates of this course in high demand across diverse sectors.</p> <p><b>Job Prospects:</b></p> <p>Completing the Advanced Python Programming Course opens doors to advanced positions in software development, data engineering, scientific computing, and research. Job prospects include roles such as Python developer, data scientist, machine learning engineer, and backend developer, among others.</p>
2	<b>Vertical:</b>	SEC
3	<b>Type:</b>	Practical
4	<b>Credits:</b>	2 credits ( 1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester )
5	<b>Hours Allotted:</b>	60 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<p><b>Course Objectives(CO):</b></p> <p><b>CO 1.</b> Master OOPs principles, solving real-world problems.</p> <p><b>CO 2.</b> Create robust Python classes, transfer members efficiently.</p> <p><b>CO 3.</b> Understand and implement inheritance, utilize advanced polymorphism..</p> <p><b>CO 4.</b> Implement abstract classes, leverage interfaces for flexible code.</p> <p><b>CO 5.</b> Create and synchronize threads, mitigate deadlock issues.</p>	
8	<p><b>Course Outcomes (OC):</b></p> <p><b>OC 1.</b> Demonstrate comprehensive OOPs proficiency, apply principles effectively.</p> <p><b>OC 2.</b> Develop efficient, reusable classes, successfully transfer members.</p> <p><b>OC 3.</b> Ability to implement inheritance and apply advanced polymorphism.</p> <p><b>OC 4.</b> Ability to implement abstract classes, demonstrate flexibility through interfaces.</p> <p><b>OC 5.</b> Ability to thread creation, synchronization, and effective deadlock resolution.</p>	

9	<p><b>Modules:-</b></p> <p><b>Module 1 (30 hours):</b></p> <p><b>OOPs In Python:</b> Introduction to OOPs, Problems in Procedure Oriented Approach, Features of Object Oriented Programming System (OOPS), Constructors and Destructors,</p> <p><b>Classes and Objects-</b> Creating a Class, Self-Variable, Types of Variables, Types of Methods, Passing Members of One Class to Another Class</p> <p><b>Inheritance and Polymorphism:</b> Types of Inheritance, Constructors in Inheritance, Overriding Super Class Constructors and Methods, super() method, Polymorphism, Duck Typing , Operator Overloading, Method Overloading, Method Overriding</p> <p><b>Abstract Classes and Interfaces:</b> Abstract Class, Abstract Method, Interfaces in Python</p> <p><b>Threads in Python:</b> Creating Threads in Python, Single Tasking and Multitasking, Thread Synchronisation, Deadlock in Threads</p> <hr/> <p><b>Module 2 (30 hours):</b></p> <p><b>Working with Databases:</b> DBMS, working with MySQL Database-retrieving, inserting, deleting, updating rows from table, Creating Database Tables through Python</p> <p><b>Exceptions:</b> Errors in a Python Program, Exceptions and Exceptions handling, User Defined Exceptions, Logging Exceptions,</p> <p><b>Networking:</b> TCP/IP Protocol Architecture, , User Datagram Protocol (UDP), FTP Architecture, Web Page Operations, Sending a Simple Mail</p> <p><b>Graphical User Interface:</b> Creating a GUI in Python, Widget classes, Layout Manager, Event Handling</p> <p><b>Data Science Tools:</b> Introduction to NumPy, Matplotlib, pandas, Scipy,</p>
10	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Practical Programming: An Introduction to Computer Science Using Python 3, Paul Gries , Jennifer Campbell, Jason Montojo, Pragmatic Bookshelf, 2nd Edition, 2014</li> <li>2. Programming through Python, M. T Savaliya, R. K. Maurya&amp; G M Magar, Sybgen Learning India, 2020</li> </ol>
11	<p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Python: The Complete Reference, Martin C. Brown, McGraw Hill, 2018</li> <li>2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2017</li> <li>3. Programming in Python 3, Mark Summerfield, Pearson Education, 2nd Ed, 2018</li> </ol>

<b>12</b>	<b>Internal Continuous Assessment: 40%</b>	<b>Semester End Examination: 60%</b>												
<b>13</b>	<p>The internal evaluation will be determined by the completion of practical tasks and the submission of corresponding write-ups for each session. Each practical exercise holds a maximum value of 5 marks. The total evaluation, out of 50 marks, should be scaled down to a final score of 20 marks.</p> <p><b>Total: 20 marks</b></p>	<p><b>A Semester End Practical Examination of 2 hours duration for 30 marks</b> as per the paper pattern given below.</p> <p><b>Certified Journal is compulsory</b> for appearing at the time of Practical Exam</p> <p><b>Total: 30 Marks</b></p>												
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## Letter Grades and Grade Points:

<b>Semester GPA/ Programme CGPA Semester/ Programme</b>	<b>% of Marks</b>	<b>Alpha-Sign/ Letter Grade Result</b>	<b>Grading Point</b>
9.00 - 10.00	90.0 – 100	O (Outstanding)	10
8.00 - < 9.00	80.0 - < 90.0	A+ (Excellent)	9
7.00 - < 8.00	70.0 - < 80.0	A (Very Good)	8
6.00 - < 7.00	60.0 - < 70.0	B+ (Good)	7
5.50 - < 6.00	55.0 - < 60.0	B (Above Average)	6
5.00 - < 5.50	50.0 - < 55.0	C (Average)	5
4.00 - < 5.00	40.0 - < 50.0	P (Pass)	4
Below 4.00	Below 40.0	F (Fail)	0
Ab (Absent)	----	Ab (Absent)	0

## As Per NEP 2020

# University of Mumbai



<b>Syllabus for Basket of Minor</b>	
<b>Board of Studies in Data Science</b>	
<b>UG First Year Programme</b>	
<b>Semester</b>	<b>II</b>
<b>Title of Paper</b>	<b>Credits 2/ 4</b>
I. DS_Descriptive Statistics (Minor)	2
<b>From the Academic Year</b>	<b>2024-2025</b>

Name of the Course: DS\_Descriptive Statistics

Sr.No.	Heading	Particulars
1	<b>Description of the course:</b>	<p>Descriptive Statistics serves as a foundational element in the vast landscape of Data Science, providing essential tools and techniques for understanding, summarizing, and visualizing data. In this course, students delve into the fundamental principles and methodologies of Descriptive Statistics, which form the bedrock upon which more advanced statistical analyses are built. Through a combination of theoretical concepts and practical applications, students gain a comprehensive understanding of how to effectively analyze and interpret data. Descriptive statistics plays a pivotal role in various industries due to its versatile applications in data analysis, decision-making, and problem-solving.</p> <p><b>Application:</b> Market Research and Consumer Behaviour Analysis, Financial Analysis and Risk Management, Healthcare and Epidemiology, Quality Control and Process Improvement, Education and Academic Research, Social Sciences and Public Policy, Sports Analytics and Performance Analysis, Environmental Science and Climate Research</p>
2	<b>Vertical</b>	<b>Minor</b>
3	<b>Type</b>	Theory
4	<b>Credits</b>	2 credits (1 credit = 15 Hours for Theory)
5	<b>Hours Allotted</b>	30 Hours
6	<b>Marks Allotted</b>	50 Marks
7	<b>Course Objectives (CO):</b>	<p><b>CO 1:</b> To understand different types of Data, and to analyze and present the data.</p> <p><b>CO 2:</b> To compute various Measures of Central Tendencies.</p> <p><b>CO 3:</b> To compute various Measures of Dispersion.</p> <p><b>CO 4:</b> To understand the concept of Skewness and Kurtosis.</p> <p><b>CO 5:</b> To compute the Correlation Coefficient for bivariate data and further apply the regression analysis.</p>
8	<b>Course Outcomes (OC):</b>	<p><b>CO 1.</b> Able to organize, manage, and present the data.</p>

	<p><b>CO 2.</b> To understand the use of Measures of Central Tendencies and Dispersion.</p> <p><b>CO 3.</b> Able to understand and compute the consistent and inconsistent data</p> <p><b>CO 4.</b> Able to identify the association between variables</p> <p><b>CO 5.</b> Able to understand forecasting techniques and to find cause and effect relationship between variable through regression analysis.</p>
9	<p><b>Modules: -</b></p> <p><b>Module 1:</b></p> <ol style="list-style-type: none"> <li><b>1. Introduction of Statistics:</b> Meaning of Statistics as a Science, Importance of Statistics. Statistical organizations in India and their functions: CSO, ISI, NSS, IIPS (Devnar, Mumbai), Bureau of Economics and statistics. Concept of population and sample. Finite, Infinite population ,Notion of SRS,SRSWOR and SRSWR I b) Types of Characteristics, Different types of scales: nominal, 12 ordinal, interval and ratio scale. Linear and circular scale. Univariate frequency distribution of discrete and continuous variables and Cumulative frequency distribution. Data Presentation: Frequency Distribution, Histogram and Ogives Curves.</li> <li><b>2. Measures of Central Tendencies:</b> Concept of Central Tendency, characteristics of good measures of Central Tendency, Positional Averages: Median, Mode, Partition values: Quartiles, Deciles and Percentiles -examples of ungrouped and grouped data</li> <li><b>3. Measures of Dispersion:</b> Concept of Dispersion, Requirements of good measures of Dispersion, Absolute and Relative measures of Dispersion: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Combined Standard Deviation-examples of ungrouped and grouped data</li> <li><b>4. Raw and Central Moments:</b> relation between Raw and Central moments, concept of Skewness and Kurtosis.</li> </ol> <p><b>Module 2:</b></p> <ol style="list-style-type: none"> <li>1. Concept of Correlation, types and interpretation, Scatter Diagram, Product Moment Correlation Coefficient, and its properties</li> <li>2. Spearman' s Rank Correlation (with and without ties)</li> <li>3. Concept of Linear Regression, Principle of Least Square, Fitting a straight line by method of least square.</li> <li>4. Difference between Correlation and Regression, relation between Correlation and Regression</li> <li>5. Concept of multiple correlation</li> <li>6. Concept of multiple regression and logistics regression</li> </ol>
10	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Sarma, K. V. S. (2001). Statistics Made it Simple: Do it yourself on PC. Prentce Hall of India, NewDelhi.</li> <li>2. Agarwal, B. L. (2003). Programmed Statistics, Second Edition, New Age International Publishers, NewDelhi.</li> <li>3. Purohit, S. G., Gore S. D., Deshmukh S. R. (2008). Statistics Using R, Narosa Publishing House, NewDelhi.</li> </ol>

	<p>4. Schaum"s Outline Of Theory And Problems Of Beginning Statistics, Larry J. Stephens, Schaum"s Outline Series Mcgraw-Hill</p> <p>5. Gupta, S.C. and Kapoor, V.K. (1987): Fundamentals of Mathematical Statistics, S. Chand and Sons, New Delhi</p>	
<b>11</b>	<p><b>Reference Books</b></p> <p>1. Goon AM,Gupta MK, Das Gupta B: Fundamentals of Statistics, Vol-I, the World Press Pt. Ltd, Kolkata</p> <p>2. Shah R.J: Descriptive Statistics: Seth Publication, Eight Edition</p> <p>3. Spiegel M.R: Theory and Problems of Statistics, Schaum's Publishing Series, Tata McGraw-Hill, First Edition</p> <p>4. Basic Statistics: Agarwal B.L: New Age International Ltd</p>	
<b>12</b>	<p><b>Internal Continuous Assessment: 40%</b></p>	<p><b>Semester End Examination: 60%</b></p>
<b>13</b>	<p><b>Continuous Evaluation through:</b></p> <p>Class test of 1 of 15 marks</p> <p>Class test of 2 of 15 marks</p> <p>Average of the two: 15 marks</p> <p>Quizzes/ Presentations/ Assignments: 5 marks</p> <p>Total: 20 marks</p>	
<b>14</b>	<p><b>Format of Question Paper:</b></p> <p>Q1: Attempt any two (out of four) from Module 1 (15 marks)</p> <p>Q2: Attempt any two (out of four) from Module 2 (15 marks)</p>	

**Sign of Chairperson**  
**Dr. Mrs. R. Srivaramangai**  
**Ad-hoc BoS (Data Science)**

**Sign of the**  
**Offg. Associate Dean**  
**Dr. Madhav R. Rajwade**  
**Faculty of Science & Technology**

**Sign of Offg. Dean,**  
**Prof. Shivram S. Garje**  
**Faculty of Science & Technology**



AC – 20.04.2024  
Item No. – 5.10 (N) Sem II (14b)

## As Per NEP 2020

# University of Mumbai



<b>Syllabus for Basket of OE</b>	
<b>Board of Studies in ENGLISH</b>	
<b>UG First Year Programme</b>	
<b>Semester II</b>	
<b>Title of Paper</b>	<b>Credits 2/ 4</b>
<b>Academic and Business Writing (English)</b>	<b>2</b>
<b>From the Academic Year</b>	<b>2024-2025</b>

Sr. No.	Heading	Particulars
1	<p><b>Description the course :</b></p> <p><b>Including but Not limited to :</b></p>	<p><b>Academic and Business Writing (English)</b></p> <p>Although academic and business writing often belong to divergent domains of professional activity, an interdisciplinary approach allows us to see the multiple commonalities they share in essence and characteristics. Both academic and business writing are professional, structured and persuasive forms of writing that depend on cogent arguments, logical progression, citable evidence, and precise vocabulary.</p> <p>We are transitioning to a world where professions are becoming increasingly networked and inherently interdisciplinary. A working knowledge of the fundamentals of both academic and business writing—of their specific uses and their common elements—can be beneficiary to learners in either or both academic and business contexts. Although the target audience is different in both cases, it is undoubtedly true that improving academic and business writing skills will benefit any learner who aims to communicate and convince their audience through clear, articulate, well-developed and evidence-based writing.</p>
2	<b>Vertical :</b>	Open Elective
3	<b>Type :</b>	Theory
4	<b>Credit:</b>	2 credits ( 1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	<b>Hours Allotted :</b>	30 Hours
6	<b>Marks Allotted:</b>	50 Marks

<b>7</b>	<p><b>Course Objectives:</b></p> <ol style="list-style-type: none"> <li>1. To familiarize learners familiar with the basics of academic and business writing.</li> <li>2. To enable learners to develop an idea into simple academic texts, eg essay or review.</li> <li>3. To make learners aware of the risks of plagiarism and the importance of correct citation.</li> <li>4. To enable learners to write persuasively in simple business contexts, eg. resumes, emails, and business proposals.</li> </ol>
<b>8</b>	<p><b>Course Outcomes:</b></p> <p>At the end of the course, learners will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the basic types and features of academic and business writing.</li> <li>2. Develop their ideas into well-structured academic essays and reviews.</li> <li>3. Correctly use references in their writing through proper citation and bibliography.</li> <li>4. Write effectively in business contexts like job resumes, workplace emails and business proposals.</li> </ol>
<b>9</b>	<p><b>Modules:- Per credit One module can be created</b></p>

**Module 1: (15 Lectures)                      ACADEMIC WRITING**

A) Academic Writing: Definition, Types, Characteristics

B) Process of Developing an Idea:

- Sourcing information: Primary sources (eg. Surveys), Secondary sources (Print, Digital)
- Structuring and sequencing
- Editing and Proof-reading

C) Writing an academic review: Review of book/ film/ web-series

D) - What is Plagiarism and how to avoid it

- Importance of Citation: In-text citation, footnotes, endnotes
- How to write a Bibliography

[Note to teachers: Please emphasize on a practical approach in Sections B, C and D.]

**Module 2: (15 Lectures) BUSINESS WRITING**

A) Business Writing: Definition, Types, Characteristics

B) Writing Effective Resumes:

- difference between resume, CV and bio-data
- styles of resumes
- keywords in resume writing
- covering letter

C) Writing and Responding to Business Emails:

- Enquiries, Orders, Complaints, Adjustments

## D) Drafting a Business Proposal

[Note to teachers: Please emphasize on a practical approach in Sections B, C and D.]

**Text Books: N.A.**

### References:

- Appleman, Jack. *Ten Steps to Successful Business Writing*. Association for Talent Development, 2017.
- Atkinson, Ian. *The Financial Time Essential Guide to Business Writing: How to Engage, Persuade and Sell*. Pearson Education, 2012.
- Boros, Claudine.L. *The Essentials of Business Writing*. Research and Education Association, 1996.
- Canavor, Natalie. *Business Writing Today: A Practical Guide*. Sage Publications, 2018.
- Candlin, Christopher, Peter Crompton and Basil Hatim. *Academic Writing Step by Step: A Research-Based Approach*. Equinox Publishing, 2016.
- Garner, Bryan. *HBR Guide to Better Business Writing*. Harvard Business Review Press, 2012.
- Giltrow, Janet, Richard Gooding, Daniel Burgoyne, Marlene Sawatsky. *Academic Writing: An Introduction (Third Edition)*. Broadview Press, 2014.
- Godfrey, Jeanne, and Melinda Whong (eds.). *What is Good Academic Writing? Insights into Discipline-Specific Student Writing*. Bloomsbury Publishing, 2020.
- Leki, Ilona. *Academic Writing: Exploring Processes and Strategies*. St Martins Press, 1998.
- Prinz, Patricia, and Birna Arnbjörnsdóttir. *The Art and Architecture of Academic Writing*. John Benjamins Publishing Company, 2021.
- Read, Siew Hean. *Academic Writing Skills for International Students*. Bloomsbury Publishing, 2018.
- Roe, Steven Charles, and Pamela Den Ouden. *Academic Writing: The Complete Guide*. Canadian Scholars Publishing, 2018.
- Stockard, Olivia. *The Write Approach: Techniques for Effective Business Writing*. Emerald Publishing, 2011.
- Watson, Jane. *Business Writing Basics*. Self-Counsel Press, 2007.

### Web References:

- <https://corporatefinanceinstitute.com/resources/career/business-writing/>
- <https://www.eapfoundation.com/writing/what/>

- [www.indeed.com/career-advice/career-development/academic-writing](http://www.indeed.com/career-advice/career-development/academic-writing)
- <https://www.sydney.edu.au/students/writing/types-of-academic-writing.html>
- <https://technicalwriterhq.com/writing/business-writing/>
- <https://writingcenter.unc.edu/tips-and-tools/business-letters/>
- <https://www.coursera.org/learn/writing-for-business> (MOOC)
- <https://www.udemy.com/course/the-business-writing-course> (MOOC)
- <https://www.coursera.org/learn/introduction-to-academic-writing> (MOOC)
- <https://www.edx.org/learn/writing/technische-universitat-munchen-academic-writing-made-easy> (MOOC)
- [https://onlinecourses.swayam2.ac.in/cec20\\_ge29/preview](https://onlinecourses.swayam2.ac.in/cec20_ge29/preview) (MOOC on academic writing)

12	<b>Internal Continuous Assessment: 40%</b>	<b>External, Semester End Examination 60%</b> <b>Individual Passing in Internal and External Examination</b>
13	<p><b>Continuous Evaluation through:</b></p> <ul style="list-style-type: none"> <li>• Performance in tutorial-based activities (during lectures) or class tests: 10 marks</li> <li>• Written assignments or projects (based on practical approaches): 10 marks</li> </ul> <p>Learners will have to write and submit written assignments in a timely manner.</p> <p><b>Suggested Activities:</b></p> <ul style="list-style-type: none"> <li>• Writing a short academic/research essay based on learning from Module 1 B</li> <li>• Writing a book/ film/ web-series review</li> <li>• Writing or arranging a bibliography</li> <li>• Writing a resume adapted to different job applications</li> <li>• Business email writing exercises</li> <li>• Writing a proposal for a start-up / entrepreneurship</li> </ul>	

<b>14</b>	<b>Format of Question Paper:</b> for the final examination  <p style="text-align: center;"><b>(A) External / Semester End Examination</b>                      <b>Marks: 30</b>                      <b>Time: 1 Hours</b></p> <p>Q1 Essay Type Questions (Attempt Any One out of two Based on Unit I). Marks 10 Q.2 Essay Type Questions (Attempt Any One out of two Based on Unit II). Marks 10 Q.3 Short Notes/Problem (Attempt Any Three out of five Based on all Units). Marks 10</p>
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Name of the Faculty**

## As Per NEP 2020

# University of Mumbai



<b>Syllabus for Basket of Open Electives</b>	
<b>Ad- hoc Board of Studies in B. Com. (Management Studies)</b>	
<b>UG First Year Programme</b>	
<b>Semester</b>	<b>II</b>
<b>Title of Paper</b>	<b>Credits 2/ 4</b>
<b>Marketing Mix - II</b>	<b>2</b>
<b>From the Academic Year</b>	<b>2024-25</b>

Sr. No.	Heading	Particulars
1	<b>Description the course:</b>  <b>Including but not limited to:</b>	Management is not only an essence in all fields but it is a prevalent tool in the hands of corporates to governments. From planning to controlling and from budgeting to reporting, all managerial elements are the most essential parts of daily life. So the learners need to know about all aspects from rural development to creating artificial intelligence. They will understand how to develop India, one of the fifth most powerful economies in the world. It is expected that the learners should learn how to develop our economy and management for the future generation from these managerial facets.
2	<b>Vertical :</b>	Major/Minor/ <b>Open Elective</b> /Skill Enhancement / Ability Enhancement/Indian Knowledge System (Choose By √)
3	<b>Type :</b>	Theory / Practical
4	<b>Credit:</b>	2 credits
5	<b>Hours Allotted :</b>	30 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. To facilitate the students to understand the importance and the relevance of place and promotion in today's marketing environment.</li> <li>2. To understand the need &amp; application of place and promotion as the marketing mix variables.</li> <li>3. To understand how to effectively make use of place and promotion to improve sales.</li> </ol>	



<b>8</b>	<p><b>Course Outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Students will understand thoroughly place and promotion as marketing mix variables so as to solve marketing problems.</li> <li>2. Learner should apply and analyze place and promotion marketing mix skills in marketing manager.</li> <li>3. Learners should evaluate and create marketing strategy with place and promotion as an important marketing</li> </ol>
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<b>9</b>	<p><b>Modules:-</b></p> <hr/> <p><b>Module 1:</b> Place/ Physical Distribution</p> <ol style="list-style-type: none"> <li>a) Channels of distribution – meaning – factors affecting channel selection-types of marketing channels, Functions of Distribution Channel</li> <li>b) Physical distribution - Importance of distribution in developing country- Middlemen- Importance, Types- selection and managing dealers- Distribution Channels Management - Importance, types</li> </ol> <hr/> <p><b>Module 2:</b> Promotion Mix</p> <ol style="list-style-type: none"> <li>a) Promotion – Meaning definition - Characteristics, Significance, Types, Role of promotion in marketing, Promotional strategies</li> <li>b) Promotion mix - Components, Factors affecting the promotion mix , Building skills for effective promotion in marketing management, Sales promotion- Meaning -Types</li> </ol>
<b>10</b>	<p><b>Text Books:</b></p> <ul style="list-style-type: none"> <li>● <i>K.S. Chandrasekar, MARKETING MANAGEMENT TEXT AND CASES, Tata McGraw-Hill Publication, New Delhi.2010, Govindarajan</i></li> <li>● <i>MARKETING MANAGEMENT CONCEPTS, CASES, CHALLENGES AND TRENDS, Prentice Hall of India, New Delhi. 2009 Philip Kotler</i></li> <li>● <i>MARKETING MANAGEMENT- ANALYSIS PLANNING AND CONTROL, Prentice Hall of India, New Delhi, Ramaswamy. V S &amp; Namakumari. S</i></li> </ul>

11	<b>Reference Books:</b> <ul style="list-style-type: none"> <li>• <i>MARKETING MANAGEMENT-PLANNING IMPLEMENTATION AND CONTROL, Macmillan Business Books, New Delhi, 2002</i></li> <li>• <i>Fundamentals of Marketing, Tata-McGraw Hill, New Delhi. Stanton, Etzel, Walker</i></li> <li>• <i>McCarthy, E.J., Basic Marketing: A managerial approach, Irwin, New York. Stanton, Etzel, Walker</i></li> </ul>	
12	<b>Internal Continuous Assessment: 40%</b>	<b>External, Semester End Examination Individual Passing in Internal and External Examination : 60%</b>
13	<b>Continuous Evaluation through:</b> Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.( at least 3 )	
14	<b>Format of Question Paper:</b> for the final examination <b>External Paper Pattern (30 Marks)</b> Q1. Case Study Analysis <span style="float: right;">10 Marks</span> Q2. Answer the following (Any One) <span style="float: right;">10 marks</span> A Or B Q3. Answer the following (Any One) <span style="float: right;">10 Marks</span> A Or B	

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 Offg. Associate Dean  
 Prin. Kishori Bhagat  
 Faculty of  
 Management

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 Offg. Dean  
 Prof. Kavita Laghate  
 Faculty of Commerce  
 & Management

## As Per NEP 2020

# University of Mumbai



<b>Syllabus for Basket of AEC</b>	
<b>Board of Studies in HINDI</b>	
<b>UG First Year Programme</b>	
<b>Semester</b>	<b>II</b>
<b>Title of Paper</b>	<b>Credits</b>
हिन्दी भाषा : कौशल के आधार	2
<b>From the Academic Year</b>	<b>2024-25</b>

Sr. No.	Heading	Particulars
1	<b>Description the course :</b>  <b>Including but Not limited to :</b>	<p style="text-align: center;"><b>हिन्दी भाषा : कौशल के आधार</b></p> <p>हिंदी राजभाषा होने के साथ-साथ भारत में बोलीजने वाली एक प्रमुख भाषा है। भारत के अधिकांश निवासी और यहां तक कि भारत के बाहर बसनेवाले भारतवंशी भी अपने दैनिक आपसी वार्तालाप, कार्य-व्यवहार में हिंदी भाषा का ही प्रयोग करते हैं। विश्व की प्रमुख पांच भाषाओं के अंतर्गत हिंदी का अस्तित्व है, इस दृष्टि से हिंदी को लेकर विभिन्न प्रकार के कौशल सीखे और सिखाए जा सकते हैं। विद्यार्थियों के लिए हिंदी एक सामान्य भाषा होने के साथ विशेष भाषा तब बन जाती है जब वह हिंदी के माध्यम से अपने कौशल में अभिवृद्धि करें, हिंदी के माध्यम से रोजगार के कई अवसरों को प्राप्त करें। इस दृष्टि से पाठ्यक्रम अत्यंत लाभवर्धक और उपयोगी सिद्ध होगा। हिंदी भाषा में कौशल विकास की असीम संभावनाएं हैं और कौशल के विभिन्न आयाम जुड़े हुए हैं जो अलग-अलग दिशाओं में देखे जा सकते हैं। पाठ्यक्रम विद्यार्थियों में लेखन, वाचन कौशल की अभिवृद्धि करने के साथ रोजगारपरक अवसर प्रदान करता है।</p>
2	<b>Vertical :</b>	Open Elective
3	<b>Type :</b>	Theory
4	<b>Credit:</b>	2 credits ( 1 credit = 15 Hours for Theory in a semester )
5	<b>Hours Allotted :</b>	30 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<b>Course Objectives: ( List some of the course objectives )</b> <ol style="list-style-type: none"> <li>1. विद्यार्थियों को लेखन, वाचन कौशल का ज्ञान देना एवं रोजगार के अवसरों से जोड़ना।</li> <li>2. विद्यार्थियों को लेखन, वाचन कौशल से परिचय करते हुए अभिव्यक्ति की शैलियों का विकास करना।</li> <li>3. विद्यार्थियों को भाषण कला के विविध रूपों को समझाना, मौलिकता में अभिवृद्धि लाना एवं विशेषज्ञता दिलाना।</li> <li>4. विद्यार्थियों को श्रवण कौशल की विशेषताओं से परिचय कराते हुए श्रवण कौशल के लाभों से अवगत कराना।</li> </ol>	

8	<p><b>Course Outcomes:</b> ( List some of the course outcomes )</p> <p>CO-1) विद्यार्थियों को लेखन, वाचन कौशल के ज्ञान प्राप्ति के साथ मौलिक अभिव्यक्ति में बदलाव आएगा।</p> <p>CO-2) विद्यार्थियों का लेखन, वाचन कौशल द्वारा मानसिक विकास होगा, पठन-शक्ति, शैली का विकास होगा।</p> <p>CO-3) विद्यार्थियों को लेखन, भाषण कौशल से भाषिक-शक्ति, शैलियों का संवर्धन होगा विशेषज्ञता आएगी।</p> <p>CO-4) विद्यार्थियों को लेखन, वाचन, श्रवण, भाषण कौशल की विशेषताओं और उपयोगिता का ज्ञान प्राप्त होगा।</p>									
9	<p><b>Modules:-</b></p> <table border="1" data-bbox="248 688 1518 1438"> <thead> <tr> <th data-bbox="248 688 467 751">इकाई</th> <th data-bbox="467 688 1255 751">पाठ</th> <th data-bbox="1255 688 1518 751">व्याख्यान संख्या</th> </tr> </thead> <tbody> <tr> <td data-bbox="248 751 467 1094">इकाई -1</td> <td data-bbox="467 751 1255 1094">           1. लेखन कौशल का अर्थ एवं स्वरूप            2. लेखन कौशल की उपयोगिता एवं महत्व            3. लेखन कौशल की विधियाँ            4. लेखन कौशल के भेद एवं विशेषताएँ            5. वाचन कौशल का अर्थ, स्वरूप एवं विशेषताएँ            6. वाचन कौशल की उपयोगिता            7. वाचन कौशल की विधियाँ एवं विशेषताएँ         </td> <td data-bbox="1255 751 1518 1094">व्याख्यान- 15 क्रेडिट- 01</td> </tr> <tr> <td data-bbox="248 1094 467 1438">इकाई -2</td> <td data-bbox="467 1094 1255 1438">           8. भाषण कौशल का अर्थ एवं स्वरूप            9. भाषण कौशल का महत्व एवं उपयोगिता            10. भाषण कौशल की विशेषताएँ            11. भाषण कौशल की विधियाँ            12. श्रवण कौशल का अर्थ एवं स्वरूप            13. श्रवण कौशल का महत्व एवं उपयोगिता            14. श्रवण कौशल की विशेषताएँ         </td> <td data-bbox="1255 1094 1518 1438">व्याख्यान- 15 क्रेडिट- 01</td> </tr> </tbody> </table>	इकाई	पाठ	व्याख्यान संख्या	इकाई -1	1. लेखन कौशल का अर्थ एवं स्वरूप 2. लेखन कौशल की उपयोगिता एवं महत्व 3. लेखन कौशल की विधियाँ 4. लेखन कौशल के भेद एवं विशेषताएँ 5. वाचन कौशल का अर्थ, स्वरूप एवं विशेषताएँ 6. वाचन कौशल की उपयोगिता 7. वाचन कौशल की विधियाँ एवं विशेषताएँ	व्याख्यान- 15 क्रेडिट- 01	इकाई -2	8. भाषण कौशल का अर्थ एवं स्वरूप 9. भाषण कौशल का महत्व एवं उपयोगिता 10. भाषण कौशल की विशेषताएँ 11. भाषण कौशल की विधियाँ 12. श्रवण कौशल का अर्थ एवं स्वरूप 13. श्रवण कौशल का महत्व एवं उपयोगिता 14. श्रवण कौशल की विशेषताएँ	व्याख्यान- 15 क्रेडिट- 01
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10	<p><b>संदर्भ ग्रंथ सूची -</b></p> <ol style="list-style-type: none"> <li>1. हिंदी भाषा शिक्षण के विविध आयाम - प्राध्यापक डॉ. राठौर, किनले एडिशन</li> <li>2. अभिनव पत्र लेखन - डॉ अनिल सिंह</li> <li>3. हिंदी के व्यावहारिक रूप - डॉ संतोष मोटवानी, परिदृश्य प्रकाशन, मुंबई</li> <li>4. हिंदी भाषा लेखन कौशल - गुलीबाबा पब्लिकेशन प्राइवेट लिमिटेड</li> </ol>									

11	<b>Internal Continuous Assessment: 40%</b>	<b>External, Semester End Examination 60%</b> <b>Individual Passing in Internal and External Examination</b>
12	<b>Continuous Evaluation through:</b> <u>मूल्यांकन प्रारूप</u> <b>आंतरिक मूल्यांकन- 20- अंक</b>  रचनात्मक कार्य, प्रकल्प इत्यादि- 10 अंक, कक्ष शिक्षण के दौरान सहभागिता इत्यादि - 05 अंक अकादमिक, व्यावसायिक एवं कौशल संवर्धन गतिविधियाँ- 05 अंक कुलयोग -20 अंक	
13	<b>Format of Question Paper:</b> <u>बाह्य मूल्यांकन- लिखित परीक्षा- 30- अंक</u>  <u>निम्नलिखित तीन में से किन्हीं दो प्रश्नों के उत्तर लिखिए</u>  कुलयोग- 30 अंक	<u>परीक्षा अवधि- 01 घंटा</u>  <u>30 अंक</u>



**Sign of the BOS**  
**Chairman**  
**Name of the**  
**Chairman**  
**Name of the BOS**

**Sign of the**  
**Offg. Associate Dean**  
**Name of the Associate**  
**Dean**  
**Name of the Faculty**

**Sign of the**  
**Offg. Dean**  
**Name of the Offg. Dean**  
**Name of the Faculty**

# As Per NEP 2020

## University of Mumbai



**Title of the Course Law related to Intellectual  
Property Rights  
Semester – Sem I  
Syllabus for Two Credit**

**(With effect from the academic year 2024-25)**

<b>Law related to Intellectual Property Rights</b>	
<b>PROGRAM</b>	<b>BA /BSc/ BCom</b>
<b>SEMESTER</b>	<b>I</b>
<b>COURSE TITLE</b>	<b>Law related to Intellectual Property Rights</b>
<b>VERTICLE /CATEGORY</b>	<b>E (Value Education Course)</b>
<b>COURSE LEVEL</b>	<b>50</b>
<b>COURSE CODE</b>	
<b>COURSE CREDIT</b>	<b>2</b>
<b>HOURS PER WEEK THEORY</b>	<b>2</b>
<b>HOURS PER WEEK PRACTICAL/TUTORIAL</b>	

<b>COURSE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>□ Learners will be enabled with the knowledge of the branch of the law that rights given to persons over the creation of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period.</li> <li>□ To impart knowledge on identification of diverse types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP.</li> <li>□ Learners will be able to recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.</li> <li>□ To facilitate students to identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development</li> </ul>



### **COURSE OUTCOME**

CO1: Learners will be able to study development and reform of intellectual propertyright institutions and their impact on creativity and innovation.

CO2: Learners will be able to critically analyze the principles of Tortious liability, develop familiarization of process of Intellectual Property Management (IPM) andvarious approaches for IPM and conducting IP and IPM auditing and explain how IP can be managed as a strategic resource and suggest IPM strategy

CO3: Learners will be well equipped with the expensive characteristics of judicialtrend related to IPR and the remedies provided under the mechanism set up by the Government Convention of IPR

### **ORGANISATION OF THE COURSE**

<b>UNIT NO</b>	<b>COURSE UNITS</b>	<b>HOURS PERWEEK</b>
1	Nature, Concept and forms of Intellectual Property and Patents	10
2	Patents and Trade Marks	10
3	Copy Rights and Geographical Indicators	10
<b>TOTAL HOURS</b>		<b>30</b>

## COURSE DESIGN

UNIT TITLE	OUTCOME	DESCRIPTION	PEDAGOGICAL APPROACH
Intellectual Property: Meaning, Nature and Significance	Learners will understand the concept of IPR and analyze the concept of liabilities.	Nature & Concept of Intellectual Property, General Principles of IP	Lecture and seminar method, Case laws
Various forms of Intellectual Properties:	Learners will be able to acquire the knowledge of the fundamentals of Intellectual property right and judicial perspective towards persons and properties.	Copyright, Patent, Trademark, Design, Geographical indication, Semi-Conductor and Plant variety	Lecture and seminar method, Case laws
Major international instruments relating to the protection of Intellectual Properties:	Learners will be able to evaluate the process of IPR mechanism set by the government.	The Paris Convention, 1883, the Berne Convention, 1886, The WIPO Convention, 1967, The TRIPS Agreement, 1994 and recent amendments.	Lecture and seminar method, Case laws

<b>CONTINUOUS ASSESSMENT TESTS (CAT) &amp; SEMESTER END EXAMINATION (SEE)</b>			
<b>NATURE OF ASSESSMENT</b>	<b>MARKS</b>	<b>METHODOLOGY</b>	<b>COURSE OUTCOME</b>
CAT 1*	10	Online Quiz, Open booktest, Class test, Assignment and Viva	CO1
CAT 2*	10	Online Quiz, Open booktest, Class test, Assignment and Viva	CO1, CO2
CAT 3*	10	Online Quiz, Open booktest, Class test, Assignment and Viva	CO3
SEE	30	Four questions of 10 markseach (from each course unit), to be attempted any 3, 10 marks may be subdivided into two sub questions of 5 marks	CO1, CO2,CO3

\*Any two.

Practical Activities and Aspect ofthe Course	Analysis of landmark cases, Field visit patent office, Visit to Trademark office,Workshop on IPR.
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<b>ESSENTIAL READINGS</b>	W.R.Cornish and D. Llewelyn, Intellectual Property: Patents, Copyrights, Trademarks and Allied Rights, Sweet & Maxwell. P. Narayanan, Intellectual Property Law, Eastern Law House
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<b>ADDITIONAL READINGS</b>	V.K. Ahuja, Law Relating to Intellectual Property Rights, LexisNexis
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Syllabus Drafting Committee -

Dr. Rajeshri N.Varhadi, Professor and In-Charge Director

(UMLA)Dr. Gouri Gargate, Professor of IIT Kharagpur.

Dr. Swati Rautela, Professor and Head Department of

Law.Dr. Sanjay Jadhav, Associate Professor

Department of Law.

Prof. Uma Nehare, Assistant Professor, University of Law Academy.

**Signature:**

**Prof. Kavita Laghate**

**Chairman of Board of Studies in Value Education**

**As Per NEP 2020**

**University of Mumbai**



**Title of the Program**

**Co-Curricular Course  
NATIONAL SERVICE SCHEME**

**SEM I & SEM II**

**Syllabus for Two Credit**

**(With effect from the academic year 2024-25)**

**UNIVERSITY OF MUMBAI**  
**National Service Scheme**

**1.1 Preamble:**

Students in the National Service Scheme are better able to comprehend all the most recent ideas. These courses include an Introduction to National Service Scheme that covers the concept of social services, which are a variety of public services meant to offer support and help to targeted specific groups, most often the underprivileged. They could be offered by individuals, autonomous, private entities, or under the management of a government body.

**1.2 Objectives of the Course:**

1. To Introduce National Service Scheme to learners and explain how it is used in current social studies.
2. To make the students aware of the need of having a foundation in social science and NSS.
3. To introduce students to social concepts and issues in society, as well as to get involved in resolving social issues.

**1.3 Learning Outcomes of the Course:** The students will be able to

1. The course will help students comprehend the foundations of the National Service Program.
2. To understand the unique camping program.
3. Students will learn about the regular activities of NSS.

**1.4. Programme Specific Outcomes:**

1. Students will be familiar with NSS fundamentals and history, particularly as they pertain to social work.
2. Students will recognize NSS and its ongoing operations.

**1.5 Programme Outcomes:**

1. Students will comprehend fundamental ideas and facts about the National Service Program.
2. Students will learn the essentials of NSS-related procedures.
3. Students will learn social work skills (such as Voter Awareness, Campus Cleanup, Tree Plantation, and Rallies).

**1.6 Modes of Internal Evaluation:** Assignment, Tutorial, Presentation, MCQs via Google, Field Visits, any other suitable mode along with marks for Attendance of the students.

**UNIVERSITY OF MUMBAI**  
**Semester II**  
**NSS CC**

**Sub: - Leadership and Community Engagement**

**Credits: 02**

**Marks: 50**

Unit Number	SEMESTER 2 Title of the Unit	No. of Lecture	No. of Credits
1	<p><b>Leadership &amp; Personality development:</b>  Meaning, definition, qualities, and characteristics of a Leader. Meaning of personality, Dimensions of personality. Personality and Leadership nexus.</p> <p>Universal Human Values and Ethics for youths  Sustainable Development Goals</p>	15	
2	<p><b>Activity Based Programmes</b> (Suggestive list given below. Colleges can plan various social activities for learners and make a detailed report) Activities can be conducted throughout the academic year .Evaluation will be based on record keeping of the attendance of the learner.</p> <p><b>Shramadhan</b> – Plantation, Cleaning, Watering, Weeding, Any other activities.</p> <p><b>Awareness Programmes</b> – Seminar, Workshops, Celebration of National and International days, Personality Development Programmes, Group Activities, etc.,</p> <p>Rally, Visit to Adopted villages, Swatchatha Programme, Visit and Conserving Ancient monuments and heritage site, Socio Economic Survey of village/slum, Nature Camp, Environmental Education, Women Empowerment Programme, Health Camps, Blood grouping awareness and Blood donation, Legal awareness Programme, Literacy Programme, Water Conservation Programme, One Day Special Camp in a village (preferably in adopted village/Adopted areas/Slums/MR Schools etc).</p>	30	

**Note:**

1. Above Paper will be exempted if the learner is involved in NSS as Volunteer and Successfully completes 60 hours in each Semester.
2. If learner as a NSS Volunteer attends any Camps at National/State/University/District/ College Special Camp will be exempted from either Sem II OR Sem IV Paper provided they produce Certificate of Participation or Attendance in Camp certified by the Programme Officer.

## Evaluation Pattern

### Internal Assessment

Assessment Criteria	Marks
Assignment / Project / Quiz/Presentations	10
Attendance, Class and Activity Participation	10
<b>Total</b>	<b>20</b>

### External Assessment Question Paper Pattern

**Time: 1:00 Hours**

**Total Marks: 30**

- Introduction:-** 1. All questions are compulsory.  
2. Figure to the Right indicates full marks.  
3. Draw neat labeled drawings wherever necessary.
- 

Q.1) Rewrite the following by choosing the correct options given below  
(with four alternatives) 6 Objectives question of 1 mark each **06 marks.**

1. a)                      b)                      c)                      d)  
2. a)                      b)                      c)                      d)

Q.2) Short Notes . (Any Two out of Four) **06marks**

- 1.
- 2.
- 3.
- 4.

Q.3) Answer the following questions (Any Three out of Five) **18 marks**

- 1.
  - 2.
  - 3.
  - 4.
  - 5.
- .....



## References:

1. National Service Scheme Manual 2006, Government of India
2. Salunkhe P.B. Ed, Chhtrapati Shahu the Pillar of Social Democracy
3. National Service Scheme Manual, Govt. of India
4. Training Programme on National Programme Scheme TISS
5. Orientation Courses for N.S.S. Programme Officers, TISS
6. Hans Gurmeet, Case Material as a Training Aid for Field Workers
7. Tarachand, History of the Freedom Movement in India Vol.II
8. Kapil K. Krishan, Social Service Opportunities in Hospitals (TISS)
9. Ram, Social Problems in India.
10. Arnold, K. (2018). What is R.E.S.P.E.C.T. When it comes to teamwork? Available at: <https://www.extraordinaryteam.com/what-is-r-e-s-p-e-c-t-when-it-comes-to-teamwork/>
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12. Barrett, R. (2013). The Values-driven Organisation: Unleashing Human Potential for Performance and Profit. London: Fulfilling Books
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15. Bishop, W. H. (2013). Defining the Authenticity in Authentic Leadership. The Journal of Values-Based Leadership, 6(1), Article 7. Available at : <https://scholar.valpo.edu/cgi/viewcontent.cgi?article=1077&context=jvbl>
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17. Cameron, K. (2008). Positive Leadership. San Francisco: Berret-Koehler.
18. Clarke, S. (2018). Why your values are key to your leadership. Leaderonomic.com Available: <https://leaderonomics.com/leadership/values-key-leadership>
19. Clarke, N. (2011). An integrated conceptual model of respect in leadership

# University of Mumbai

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Academic Authorities,  
Meetings & Services (AAMS)  
Room No. 128, M. G. Road, Fort,  
Mumbai – 400 032.  
Tel. 022-68320033

Re- accredited with A ++ Grade (CGPA 3.65) by NAAC  
Category- I University Status awarded by UGC

No. AAMS\_UGS/ICC/2024-25/ 2\9

Date: 31<sup>st</sup> January, 2025

## CIRCULAR:-

Attention of all the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head University Departments is invited to this office Circular No. AAMS\_UGS/ICC/2024-25/04 dated 11<sup>th</sup> June, 2023 relating to the NEP UG & PG Syllabus.

They are hereby informed that the recommendations made by the Ad-hoc Board of Studies in N.C.C./N.S.S./Sports Co-Curricular at its meeting held on 23<sup>rd</sup> November, 2024 and subsequently passed by the Board of Deans at its meeting held on 30<sup>th</sup> December, 2024 vide item No. 8.1 (N) have been accepted by the Academic Council at its meeting held on 27<sup>th</sup> January, 2025 vide item No. 8.1 (N) and that in accordance therewith to introduce 2 Credit Programme Co-Curricular Course Foundation and Exploration of Performing Fine Arts Sem II as per appendix (NEP 2020) with effect from the academic year 2024-25.

(The said circular is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032  
31<sup>st</sup> January, 2025

(Dr. Prasad Karande)  
REGISTRAR

To,

The Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Departments.

## AC 8.1 (N) /27/01/2025

Copy forwarded with Compliments for information to:-

- 1) The Chairman, Board of Deans,
- 2) The Dean, Faculty of Interdisciplinary,
- 3) The Chairman, Ad-hoc Board of Studies in N.C.C./N.S.S./Sports Co-Curricular,
- 4) The Director, Board of Examinations and Evaluation,
- 5) The Director, Department of Students Development,
- 6) The Director, Department of Information & Communication Technology,
- 7) The Director, Centre for Distance and Online Education (CDOE), Vidyanagari,
- 8) The Deputy Registrar, Admissions, Enrolment, Eligibility & Migration Department (AEM).



<b>Copy forwarded for information and necessary action to :-</b>	
1	The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Dept)(AEM), <a href="mailto:dr@eligi.mu.ac.in">dr@eligi.mu.ac.in</a>
2	The Deputy Registrar, Result unit, Vidyanagari <a href="mailto:drresults@exam.mu.ac.in">drresults@exam.mu.ac.in</a>
3	The Deputy Registrar, Marks and Certificate Unit,. Vidyanagari <a href="mailto:dr.verification@mu.ac.in">dr.verification@mu.ac.in</a>
4	The Deputy Registrar, Appointment Unit, Vidyanagari <a href="mailto:dr.appointment@exam.mu.ac.in">dr.appointment@exam.mu.ac.in</a>
5	The Deputy Registrar, CAP Unit, Vidyanagari <a href="mailto:cap.exam@mu.ac.in">cap.exam@mu.ac.in</a>
6	The Deputy Registrar, College Affiliations & Development Department (CAD), <a href="mailto:deputyregistrar.uni@gmail.com">deputyregistrar.uni@gmail.com</a>
7	The Deputy Registrar, PRO, Fort, (Publication Section), <a href="mailto:Pro@mu.ac.in">Pro@mu.ac.in</a>
8	The Deputy Registrar, Executive Authorities Section (EA) <a href="mailto:eau120@fort.mu.ac.in">eau120@fort.mu.ac.in</a>  He is requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to the above circular.
9	The Deputy Registrar, Research Administration & Promotion Cell (RAPC), <a href="mailto:rapc@mu.ac.in">rapc@mu.ac.in</a>
10	The Deputy Registrar, Academic Appointments & Quality Assurance (AAQA) dy.registrar.tau.fort.mu.ac.in <a href="mailto:ar.tau@fort.mu.ac.in">ar.tau@fort.mu.ac.in</a>
11	The Deputy Registrar, College Teachers Approval Unit (CTA), <a href="mailto:concolsection@gmail.com">concolsection@gmail.com</a>
12	The Deputy Registrars, Finance & Accounts Section, fort <a href="mailto:draccounts@fort.mu.ac.in">draccounts@fort.mu.ac.in</a>
13	The Deputy Registrar, Election Section, Fort <a href="mailto:drelection@election.mu.ac.in">drelection@election.mu.ac.in</a>
14	The Assistant Registrar, Administrative Sub-Campus Thane, <a href="mailto:thanesubcampus@mu.ac.in">thanesubcampus@mu.ac.in</a>
15	The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan, <a href="mailto:ar.seask@mu.ac.in">ar.seask@mu.ac.in</a>
16	The Assistant Registrar, Ratnagiri Sub-centre, Ratnagiri, <a href="mailto:ratnagirisubcentre@gmail.com">ratnagirisubcentre@gmail.com</a>
17	The Director, Centre for Distance and Online Education (CDOE), Vidyanagari, <a href="mailto:director@idol.mu.ac.in">director@idol.mu.ac.in</a>
18	Director, Innovation, Incubation and Linkages, Dr. Sachin Laddha <a href="mailto:pinkumanno@gmail.com">pinkumanno@gmail.com</a>
19	Director, Department of Lifelong Learning and Extension (DLLE), Dlleuniversityofmumbai@gmail.com

**Copy for information :-**

1	P.A to Hon'ble Vice-Chancellor, <a href="mailto:vice-chancellor@mu.ac.in">vice-chancellor@mu.ac.in</a>
2	P.A to Pro-Vice-Chancellor <a href="mailto:pvc@fort.mu.ac.in">pvc@fort.mu.ac.in</a>
3	P.A to Registrar, <a href="mailto:registrar@fort.mu.ac.in">registrar@fort.mu.ac.in</a>
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), <a href="mailto:camu@accounts.mu.ac.in">camu@accounts.mu.ac.in</a>

**To,**

1	The Chairman, Board of Deans <a href="mailto:pvc@fort.mu.ac.in">pvc@fort.mu.ac.in</a>
2	<b>Faculty of Humanities,</b> <b>Dean</b> 1. Prof.Anil Singh <a href="mailto:Dranilsingh129@gmail.com">Dranilsingh129@gmail.com</a> <b>Associate Dean</b> 2. Dr.Suchitra Naik <a href="mailto:Naiksuchitra27@gmail.com">Naiksuchitra27@gmail.com</a> 3.Prof.Manisha Karne <a href="mailto:mkarne@economics.mu.ac.in">mkarne@economics.mu.ac.in</a>
	<b>Faculty of Commerce &amp; Management,</b> <b>Dean</b> 1. Dr.Kavita Laghate <a href="mailto:kavitalaghate@jbims.mu.ac.in">kavitalaghate@jbims.mu.ac.in</a> <b>Associate Dean</b> 2. Dr.Ravikant Balkrishna Sangurde <a href="mailto:Ravikant.s.@somaiya.edu">Ravikant.s.@somaiya.edu</a> 3. Prin.Kishori Bhagat <a href="mailto:kishoribhagat@rediffmail.com">kishoribhagat@rediffmail.com</a>

	<p><b>Faculty of Science &amp; Technology</b></p> <p><b>Dean</b></p> <p>1. Prof. Shivram Garje  <a href="mailto:ssgarje@chem.mu.ac.in">ssgarje@chem.mu.ac.in</a></p> <p><b>Associate Dean</b></p> <p>2. Dr. Madhav R. Rajwade  <a href="mailto:Madhavr64@gmail.com">Madhavr64@gmail.com</a></p> <p>3. Prin. Deven Shah  <a href="mailto:sir.deven@gmail.com">sir.deven@gmail.com</a></p>
	<p><b>Faculty of Inter-Disciplinary Studies,</b></p> <p><b>Dean</b></p> <p>1. Dr. Anil K. Singh  <a href="mailto:aksingh@trcl.org.in">aksingh@trcl.org.in</a></p> <p><b>Associate Dean</b></p> <p>2. Prin. Chadrashekhhar Ashok Chakradeo  <a href="mailto:cachakradeo@gmail.com">cachakradeo@gmail.com</a></p>
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, <a href="mailto:dboee@exam.mu.ac.in">dboee@exam.mu.ac.in</a>
5	The Director, Board of Students Development, <a href="mailto:dsd@mu.ac.in@gmail.com">dsd@mu.ac.in@gmail.com</a> DSW <a href="mailto:direcotr@dsw.mu.ac.in">direcotr@dsw.mu.ac.in</a>
6	The Director, Department of Information & Communication Technology, <a href="mailto:director.dict@mu.ac.in">director.dict@mu.ac.in</a>

AC – 27/01/2025

Item No. – 8.1

## As Per NEP 2020

# University of Mumbai



### Syllabus for Basket of OE

Ad- hoc Board of Studies in N.C.C./N.S.S./Sports Co-Curricular

UG First Year Programme - Co-Curricular Course

Semester

II

Title of Paper

Credits

Foundation and Exploration of  
Performing Fine Arts

2

From the Academic Year

2024-25

**Semester II**  
**As per NEP 2020**

# **Foundation and Exploration of Performing and Fine Arts**

Syllabus for Two Credits Programme

With effect from Academic Year 2024-2025

### Aims and Objectives

- To study the foundation and essentials of performing arts.
- To understand the chronicles of Indian Artistry.
- To comprehend the modern art forms.
- To explore various career opportunities in fine arts.

### Learning Outcomes

The course will enable the learner to

- Identify and trace the historical evolution of Indian performing and fine arts.
- Analyze the transition from traditional to modern art forms in performing arts.
- Identify and describe a range of career paths in the fine and performing arts.

### Modules at Glance

#### Semester I

Module No.	Unit	Content	No. of Hours
1	I	Foundation of Performing Arts	08
	II	Essential Skill Sets in Performing Arts	07
2	III	Chronicles of Indian Artistry	08
	IV	Contemporary and Modern Art	07
<b>Total No. of Hours</b>			<b>30</b>

Module No.	Unit	Content
1	I	<b>1.1 Foundation of Performing Arts</b> <ul style="list-style-type: none"><li>• Introduction to Performing Arts</li><li>• Historical Evolution and Cultural Significance of Performing Arts</li><li>• Basic Elements of Performing Arts</li></ul>
	II	<b>1.2 Essential Skill Sets in Performing Arts</b> <ul style="list-style-type: none"><li>• Character Development and Analysis</li></ul>



		<ul style="list-style-type: none"> <li>• Emotional Exploration and Expression</li> <li>• Fundamentals of Voice Modulation and Projection</li> <li>• Improvisation Skills</li> <li>• Scene Study and Script Interpretation</li> <li>• Career Options in Performing Arts</li> </ul>
2	III	<b>2.1 Chronicles of Indian Artistry</b> <ul style="list-style-type: none"> <li>• Indus Valley Civilization</li> <li>• Folk and Tribal Art Forms</li> <li>• Impact of Aesthetic Art on Sacred Architecture</li> <li>• Revival and Preservation of Ancient Indian Art</li> </ul>
	IV	<b>2.2 Contemporary and Modern Art</b> <ul style="list-style-type: none"> <li>• Modern Trends in Indian Art</li> <li>• Eminent Contemporary Artists of India</li> <li>• Career Options in Fine Arts</li> </ul>

### Scheme of Evaluation

The Scheme of Examination shall be of 50 marks. It will be divided into Internal Evaluation (20 marks) and Semester End Examination (30 Marks).

### Semester I (50 Marks - 2 Credits)

#### Internal Evaluation (20 Marks)

Sr. No.	Particulars	Marks
1	Presentation <b>OR</b> Project <b>OR</b> Assignment	15
2	Participation in Workshop / Conference / Seminar (as decided by the Teacher) <b>OR</b> Participation in Online Workshop / Conference / Seminar (as decided by the Teacher) <b>OR</b> Field Visit <b>OR</b> Attendance	5

**Semester End Examination (30 Marks)**

<b>Question No.</b>	<b>Particulars</b>	<b>Marks</b>
1	<b>Objective Type Questions (All Units)</b>	06
2	<b>Descriptive Question(s) on Unit I</b> The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
3	<b>Descriptive Question(s) on Unit II</b> The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
4	<b>Descriptive Question(s) on Unit III</b> The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
5	<b>Descriptive Question(s) on Unit IV</b> The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
<b>Total</b>		30

**Reference Books**

- Hennessey, B. (2019). *The artist's career handbook: A guide to building your career as a visual artist*. Allworth Press.
- Kapila, V. (2002). *Indian art: A history*. Penguin India.
- Mitter, P. (2001). *Indian art*. Oxford University Press.
- Chekhov, M. (2002). *To the actor: On the technique of acting*. Routledge.
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Re- accredited with A ++ Grade (CGPA 3.65) by NAAC  
Category- I University Status awarded by UGC

No. AAMS\_UGS/ICC/2024-25/234

Date: 14<sup>th</sup> February, 2025

**CIRCULAR:-**

Attention of all the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head University Departments is invited to this office Circular No. AAMS\_UGS/ICC/2024-25/04 dated 11<sup>th</sup> June, 2023 relating to the NEP UG & PG Syllabus.

They are hereby informed that the recommendations made by the Ad-hoc Board of Studies in N.C.C./N.S.S./Sports Co-Curricular at its meeting held on 06<sup>th</sup> February, 2025 has been accepted by the Hon'ble Vice Chancellor as per the powers confirmed upon him under Section 12 (7) of the Maharashtra Public Universities Act, 2016 and that in accordance therewith syllabus of **Co-Curricular Course Introduction to Sports, Physical Literacy, Health and Fitness & Yog Sem II** as per appendix (NEP 2020) with effect from the academic year 2024-25.

(The said circular is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032  
14<sup>th</sup> February, 2025

  
(Dr. Prasad Karande)  
REGISTRAR

To,

The Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Departments.

BOS/06/02/2025

Copy forwarded with Compliments for information to:-

- 1) The Chairman, Board of Deans,
- 2) The Dean, Faculty of Interdisciplinary,
- 3) The Chairman, Ad-hoc Board of Studies in N.C.C./N.S.S./Sports Co-Curricular,
- 4) The Director, Board of Examinations and Evaluation,
- 5) The Director, Department of Students Development,
- 6) The Director, Department of Information & Communication Technology,
- 7) The Director, Centre for Distance and Online Education (CDOE), Vidyanaigari,
- 8) The Deputy Registrar, Admissions, Enrolment, Eligibility & Migration Department (AEM).

<b>Copy forwarded for information and necessary action to :-</b>	
1	The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Dept)(AEM), <a href="mailto:dr@eligi.mu.ac.in">dr@eligi.mu.ac.in</a>
2	The Deputy Registrar, Result unit, Vidyanagari <a href="mailto:drresults@exam.mu.ac.in">drresults@exam.mu.ac.in</a>
3	The Deputy Registrar, Marks and Certificate Unit,. Vidyanagari <a href="mailto:dr.verification@mu.ac.in">dr.verification@mu.ac.in</a>
4	The Deputy Registrar, Appointment Unit, Vidyanagari <a href="mailto:dr.appointment@exam.mu.ac.in">dr.appointment@exam.mu.ac.in</a>
5	The Deputy Registrar, CAP Unit, Vidyanagari <a href="mailto:cap.exam@mu.ac.in">cap.exam@mu.ac.in</a>
6	The Deputy Registrar, College Affiliations & Development Department (CAD), <a href="mailto:deputyregistrar.uni@gmail.com">deputyregistrar.uni@gmail.com</a>
7	The Deputy Registrar, PRO, Fort, (Publication Section), <a href="mailto:Pro@mu.ac.in">Pro@mu.ac.in</a>
8	The Deputy Registrar, Executive Authorities Section (EA) <a href="mailto:eau120@fort.mu.ac.in">eau120@fort.mu.ac.in</a>  He is requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to the above circular.
9	The Deputy Registrar, Research Administration & Promotion Cell (RAPC), <a href="mailto:rapc@mu.ac.in">rapc@mu.ac.in</a>
10	The Deputy Registrar, Academic Appointments & Quality Assurance (AAQA) dy.registrar.tau.fort.mu.ac.in <a href="mailto:ar.tau@fort.mu.ac.in">ar.tau@fort.mu.ac.in</a>
11	The Deputy Registrar, College Teachers Approval Unit (CTA), <a href="mailto:concolsection@gmail.com">concolsection@gmail.com</a>
12	The Deputy Registrars, Finance & Accounts Section, fort <a href="mailto:draccounts@fort.mu.ac.in">draccounts@fort.mu.ac.in</a>
13	The Deputy Registrar, Election Section, Fort <a href="mailto:drelection@election.mu.ac.in">drelection@election.mu.ac.in</a>
14	The Assistant Registrar, Administrative Sub-Campus Thane, <a href="mailto:thanesubcampus@mu.ac.in">thanesubcampus@mu.ac.in</a>
15	The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan, <a href="mailto:ar.seask@mu.ac.in">ar.seask@mu.ac.in</a>
16	The Assistant Registrar, Ratnagiri Sub-centre, Ratnagiri, <a href="mailto:ratnagirisubcentre@gmail.com">ratnagirisubcentre@gmail.com</a>
17	The Director, Centre for Distance and Online Education (CDOE), Vidyanagari, <a href="mailto:director@idol.mu.ac.in">director@idol.mu.ac.in</a>
18	Director, Innovation, Incubation and Linkages, Dr. Sachin Laddha <a href="mailto:pinkumanno@gmail.com">pinkumanno@gmail.com</a>
19	Director, Department of Lifelong Learning and Extension (DLLE), Dlleuniversityofmumbai@gmail.com

**Copy for information :-**

1	P.A to Hon'ble Vice-Chancellor, <a href="mailto:vice-chancellor@mu.ac.in">vice-chancellor@mu.ac.in</a>
2	P.A to Pro-Vice-Chancellor <a href="mailto:pvc@fort.mu.ac.in">pvc@fort.mu.ac.in</a>
3	P.A to Registrar, <a href="mailto:registrar@fort.mu.ac.in">registrar@fort.mu.ac.in</a>
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), <a href="mailto:camu@accounts.mu.ac.in">camu@accounts.mu.ac.in</a>

**To,**

1	The Chairman, Board of Deans <a href="mailto:pvc@fort.mu.ac.in">pvc@fort.mu.ac.in</a>
2	<b>Faculty of Humanities,</b> <b>Dean</b> 1. Prof.Anil Singh <a href="mailto:Dranilsingh129@gmail.com">Dranilsingh129@gmail.com</a> <b>Associate Dean</b> 2. Dr.Suchitra Naik <a href="mailto:Naiksuchitra27@gmail.com">Naiksuchitra27@gmail.com</a> 3.Prof.Manisha Karne <a href="mailto:mkarne@economics.mu.ac.in">mkarne@economics.mu.ac.in</a>
	<b>Faculty of Commerce &amp; Management,</b> <b>Dean</b> 1. Dr.Kavita Laghate <a href="mailto:kavitalaghate@jbims.mu.ac.in">kavitalaghate@jbims.mu.ac.in</a> <b>Associate Dean</b> 2. Dr.Ravikant Balkrishna Sangurde <a href="mailto:Ravikant.s.@somaiya.edu">Ravikant.s.@somaiya.edu</a> 3. Prin.Kishori Bhagat <a href="mailto:kishoribhagat@rediffmail.com">kishoribhagat@rediffmail.com</a>

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	<p><b>Faculty of Inter-Disciplinary Studies,</b></p> <p><b>Dean</b></p> <p>1. Dr. Anil K. Singh  <a href="mailto:aksingh@trcl.org.in">aksingh@trcl.org.in</a></p> <p><b>Associate Dean</b></p> <p>2. Prin. Chadrashekhhar Ashok Chakradeo  <a href="mailto:cachakradeo@gmail.com">cachakradeo@gmail.com</a></p>
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, <a href="mailto:dboee@exam.mu.ac.in">dboee@exam.mu.ac.in</a>
5	The Director, Board of Students Development, <a href="mailto:dsd@mu.ac.in@gmail.com">dsd@mu.ac.in@gmail.com</a> DSW <a href="mailto:directr@dsw.mu.ac.in">directr@dsw.mu.ac.in</a>
6	The Director, Department of Information & Communication Technology, <a href="mailto:director.dict@mu.ac.in">director.dict@mu.ac.in</a>

## As Per NEP 2020

# University of Mumbai



<b>Syllabus for Sports Co-Curricular Vertical - 6</b>	
<b>Board of Studies in NCC/NSS/Sports Co-Curricular</b>	
<b>UG First Year Programme</b>	
<b>Semester</b>	<b>II</b>
<b>Title of Paper</b>	<b>Credits</b>
<b>I) Sports, Physical Literacy, Health and Fitness &amp; Yog</b>	<b>2</b>
<b>From the Academic Year</b>	<b>2024-25</b>



## **Semester II**

### **1.1 Preamble:**

India is growing rapidly as a global super-power. To face the challenges of the century and to keep up with the pace of the world, maintaining health is of prime importance. Giving thrust to healthy society, Physical Education, Sports, Health & fitness and Yoga are of great significance in today's world. The Government of India insists on Physical Fitness, Mental Health and Overall Development of Personality for every citizen. In these lines, the Government has launched Fit India Movement, Khelo India, TOPS and National Sports Day, International Day of Yoga etc. These initiatives have given impetus and awareness among general public, professional and academicians. However, creating efficient and skilled human resource in the field of Physical Education, Sports and Yoga is identified as the need of the hour. Thus, the Governments of India and Government of Maharashtra have included Physical Education, Sports and Yoga as a key area under the NEP 2020.

### **1.2 Objectives of the Course:**

1. To understand the importance of Physical Education, Sports, & Physical Activity
2. To increase participation of students in various games and sports and fitness activities
3. To develop the physical as well as mental health through physical activity
4. To create interest regarding sports , physical fitness to inculcate healthy habits for lifelong

### **1.3 Program outcomes:**

By the end of the program the students will be able to:

1. The student will participate in various games, sports and physical activities and they will also learn the technical and tactical experience of it.
2. Students will understand the importance and benefits of participation in any fitness activity or sports.
3. Own choice based activities will be the stress buster for the students and this will inculcate healthy habits in the students
4. Students will able to organize, plan activities and will develop administrative qualities through these events
5. Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.
6. The student learns to plan, organize and execute sports events.
7. Student will learn theoretical and practical aspects of game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.
8. Student acquires the knowledge of opted games, sports and yoga and also learns the technical and tactical experience of it.
9. Student will learn to apply knowledge of Physical fitness and exercise management to lead better quality life.
10. Students will understand and learn different dimension of active life style.

**1.4 Programme Duration:** The structure of the Credit Course in Sports has two semesters in total covering a period of two years i.e. 2 credits in each semester till the fourth semester as per the guidelines of NEP 2020.

**1.5 Modes of Internal & External Evaluation:** Students will submit a hard copy of the report of total 60 hours spent for semester II in any physical activities/ training sessions/ Sports events/ yoga/ adventure activities/ any sports/ gym or pilates / to the teacher. Students will be evaluated on the basis of activities participated for the semester II.

#### 1.6 Modules at Glance – Semester II

Module No.	Unit	Content	No. of Practical Hours
1	I	<b>Importance of Physical Education and Sports</b>	15
	II	<b>Participation in any physical activities</b>	15
2	III	<b>Volunteering in any sports events or fitness events</b>	15
	IV	<b>Participation in University or any other Sports competitions</b>	15
<b>Total No. of Hours</b>			<b>60</b>

Module No.	Unit	Content
1	I	<b>1.1 Importance of Physical Education and Sports &amp; Yoga</b> <ul style="list-style-type: none"> <li>• Development of physical health as well as mental health through Physical Activities.</li> <li>• Group Sports &amp; Fitness Activities</li> <li>• Fitness activities conducted by any sports/fitness instructor such as Yoga, Zumba, Aerobics etc.</li> </ul>
	II	<b>1.2 Participation in any Physical activities</b> <ul style="list-style-type: none"> <li>• Participation in any sports practice sessions conducted by our college/ any club / any institution</li> <li>• Completion of any Yoga/ Pilates/ Gym course/ any fitness related course</li> <li>• Participation in any other physical activities of the interest of student</li> </ul>
2	III	<b>2.1 Volunteering in any sports events or fitness events</b> <ul style="list-style-type: none"> <li>• Volunteering done in sports or fitness events organized by the college</li> <li>• Volunteering in any other fitness or sports activities organized by NGO or local clubs</li> </ul>
	IV	<b>2.2 Participation in University or any other Sports competitions</b> <ul style="list-style-type: none"> <li>• Participation in University Intercollegiate/ Inter Zonal / West Zone/ All India / National / State tournaments organized by University of Mumbai or State or District Sports Federation</li> <li>• Participation in any other intra college competition organized by college</li> <li>• Participation in any recognized Sports or Fitness competitions</li> </ul>

### Scheme of Evaluation

The Scheme of Examination shall be of 50 marks. It will be divided into Internal Evaluation (20 marks) and Semester End Examination (30 Marks).

Students will submit a brief report of 60 hours spent for Semester II in any of the physical activities along with geo tagged photo, receipt, sports training session's attendance, course certificates, etc. Report should include the explanation of the following questions. A report can have multiple physical activities done for the completion of 60 hours per semester. For eg. A student can enroll himself/ herself in Yoga/ Gym and any sport simultaneously and can give proof of the attendance for the same in the report. A student must complete 60 hours in any physical activity. Students should also enroll themselves as volunteers for any sports and fitness events held in the college.

1. Why did the student select a physical activity mentioned in the report?
2. What were the benefits and experience after the completion of the 60 hours of physical activity?
3. What were the challenges faced by the student during the activity?
4. Geotagged photos of the activity clicked in the beginning, during and on the last day of the activity.
5. Enrollment receipts, ID card, certificate of the activity.
6. Conclusion remark by the student.

### Semester II (50 Marks - 2 Credits)

#### Internal Evaluation (20 Marks)

Sr. No.	Particulars	Marks
1	Presentation <b>OR</b> Project <b>OR</b> Assignment <b>(Students must include the Geo Tagged photos, Enrolment receipt, Certificate etc. in the report)</b>	10
2	Volunteering in any Sports / Fitness activities conducted by college or local clubs or NGO	10

#### Semester End Examination (30 Marks)

Question No.	Particulars	Marks
1	VIVA Conducted by teacher/ Sports In charge/ Sports Director regarding participation in Physical / Sports / Fitness activities / Fitness or Yoga Course completed by students <b>OR</b> Participation in Sports Competitions Conducted by University at State or National Level (Students who have represented Mumbai University or College at Intercollegiate / Inter Zonal / West Zone Inter University / All Indi Inter University/ International tournament)  Students who have represented in the above mentioned competitions should be exempted from VIVA and should be evaluated on the basis of his/ her performance in the above mentioned competitions.	30
<b>Total</b>		30

## References –

1. Bucher, C. A. (n.d.) Foundation of physical education. St. Louis: The C.V. Mosby Co. Deshpande, S.H. (2014). Physical Education in Ancient India. Amravati: Degree college of Physical education.
2. Mohan, V. M. (1969). Principles of physical education. Delhi: Metropolitan Book Dep. Nixon, E. E. & Cozen, F.W. (1969). An introduction to physical education. Philadelphia: W.B. Saunders Co.
3. William, J. F. (1964). The principles of physical education. Philadelphia: W.B. Saunders Co.
4. Coalter, F. (2013) Sport for Development: What game are we playing? .Routledge.
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6. Muller, J. P.(2000). Health, Exercise and Fitness. Delhi : Sports.
7. Russell, R.P.(1994). Health and Fitness Through Physical Education. USA : Human Kinetics.
8. Uppal, A.K. (1992). Physical Fitness. New Delhi : Friends Publication.
9. Nagendra, H. R. & Nagarathna, R. (2002). Samagra Yoga Chikitse. Bengaluru: Swami Vivekananda Yoga Prakasana.
10. Uppal, A.K.(1992) Physical Fitness. New Delhi: Friend Publication
11. D.M Jyoti, Yoga and Physical Activities (2015) lulu.com3101, Hills borough, NC27609, United States
12. D.M Jyoti, Athletics (2015) lulu.com3101, Hills borough, NC27609, United States

AC -28/06/2024

Item No. - 5.7 (N)

# University of Mumbai



## Syllabus for Extension Work in Vertical VI - CC

Board of Studies in Extension Work

UG First Year Program

Semester

II

Title of Paper

Credit

Extension Work

2

From the Academic Year

2024-25

## **Introduction**

The National Education Policy (NEP) 2020 is a comprehensive framework introduced by the Government of India to revamp the country's education system. It has replaced the previous National Policy on Education, which has aim to ensure universal access to quality education from preschool to higher education, including vocational education. NEP 2020 emphasizes a more holistic, multidisciplinary, and flexible curriculum which lay emphasis on conceptual understanding rather than rote learning allowing students to choose subjects across disciplines without strict boundaries.

The National Education Policy (NEP) 2020 of India addresses the role of higher education institutions in fostering community engagement and extension work. It highlights the social responsibility of higher education institutions towards their communities. It encourages institutions to engage with local communities, address societal challenges, and contribute to sustainable development. The policy promotes the implementation of outreach programs by higher education institutions to disseminate knowledge, provide services, and support community development. These programs may include literacy campaigns, career development programs, social issues awareness programs, health and hygiene initiatives, skill development workshops, and technology-oriented activities. The policy suggests integrating extension work into the curriculum of higher education programs. This allows learners to gain practical experience, develop leadership skills, and contribute to community development while pursuing their studies. It recognizes incentives to encourage active engagement in community service and extension activities.

Overall, NEP 2020 recognizes the significant role of higher education institutions in promoting community engagement, social responsibility, and sustainable development through extension work. By integrating extension activities into their mission and operations, institutions can contribute to building inclusive and resilient societies.

*Extension work in the context of education refers to the activities and programs conducted by educational institutions to engage with communities, address societal needs, and promote social development.*

### Aim of Extension Work under NEP:

- Extension work aims to identify and address the specific needs and challenges faced by communities. NEP 2020 encourages higher education institutions to engage with local communities and contribute to their development by offering programs and services that

address social needs, such as literacy programs, health awareness campaigns, and vocational training.

- Extension work aims to empower communities by providing them with the knowledge, skills, and resources they need to address their own requirements and improve their quality of life.

*Key objectives of Extension Work under NEP:*

- To ensure equal access to quality education and educational opportunities to aspirants.
- To support the government initiatives in achieving universal foundational literacy and numeracy as per sustainable development program.
- To organize remedial programs to address the learning breaches among the youth and provide unending education opportunities.
- To offer more holistic, multidisciplinary, and flexible curricular activities with an emphasis on conceptual understanding and personality development.
- To offer a wide range of activities & promote critical thinking, creativity, and innovation.
- To provide aspirants with multiple pathways for skill development and employment.
- To implement outreach programs to disseminate knowledge, provide services, and support community development.

**Extension Work Activities:**

Extension Work activities introduced by DLLE are a crucial aspect of the educational environment, offering multifaceted benefits that extend beyond academic learning. Many extension activities focus on social issues, sustainability, and environmental conservation. These activities educate the communities on sustainable practices which promote inclusivity and social justice. These activities focus especially on training women in various skills, including entrepreneurship and digital literacy through various vocational skill-oriented projects offered by the department. These activities have significantly contributed to skill development among community members, leading to improved employment opportunities and personality development. Learners participate in extension work activities as part of their curriculum, to gain practical experience and to contribute to community development. Thus, engaging in extension work fosters a sense of social responsibility and civic engagement among the learners and facilitators.

## **THE EXTENSION DIMENSION (Reach to Unreached)**

The college students are enrolled for extension work projects and perform various activities for the **social awareness based on various issues / problems in the society such as Save Girl Child, Pollution, Aids, Global Warming, Environment, Tree Plantation, Importance of Education, Illiteracy, Child Labour, Dowry Deaths, Malnutrition, Watershed Management and so many.** The students are creating awareness about these social problems / issues through various activities such as Street Play, Exhibition, Poster Making, Songs, Speech, Survey, Elocution, and participation in Seminar & Conferences. For this purpose, students are going to remote areas and involve the community and make them aware of our role in eradicating social problems faced by the society and trying to convince the people human duties as an ideal citizen.

To facilitate the sensitization of the student to the socio-cultural realities, the Department offers extension work projects encompassing social issues for the student. There are many Extension Work Projects being offered by the department under the two different units for enhancing the employability and IT skills of the student. The projects are given below for which the details are available on DLLE website at [www.mudlle.ac.in](http://www.mudlle.ac.in)

### **I) Vocational Career Oriented Projects**

1. Career Project [CP]
2. Industry Orientation Project [IOP]
3. Anna Poorna Yojana [APY]
4. Skill Development (SD)

### **II) Community Oriented Projects**

1. Population Education Club (PEC)
2. Survey Research
3. Education for All (EFA- NIOS, IDOL)
4. Environment Education
5. Civic Sense (CS)
6. Consumer Guidance



Given below are the activities / programs to be conducted by the colleges as a part of Extension Work as enlisted topics. The learner will focus on enlisted topics and participate in following activities during Semester II in this academic year.

**ACTIVITIES FOR SEMESTER II = 2 Credits**

Sr. No.	Unit	No. of Lectures
1.	<p><u>Organising &amp; Participation in Training Session</u></p> <p>Every learner should attend the orientation / training session organised by their college for orientation of annual extension work program. Attendance is compulsory. <b>In this session the learners will be oriented about the activities to be conducted during the semester followed by question-and-answer session.</b> The learner must read resource material and guideline carefully and plan his / her activities for the semester during academic year.</p>	2 Lectures
2.	<p><u>Participation in Project /Activities</u> (as given below)</p> <p><b>In this session learners will be oriented about any 5 Topics selected by college (preferably which are not taken in Semester 1) for awareness under Extension Work. The college may select more than 5 topics if the enrolment of learners is more than 200. The learners will participate in activities based on these topics selected by college.)</b></p> <ol style="list-style-type: none"> <li>1. Maharashtra Policy for women.</li> <li>2. Status of women in India. / Women achievers of modern India</li> <li>3. Banking procedures.</li> <li>4. Legal procedures.</li> <li>5. Violence against women / Laws protecting women/ Inheritance laws.</li> <li>6. Child Labour.</li> <li>7. Environment- pollution and its effect / Save Trees and Natural Resources</li> <li>8. Water Harvesting.</li> </ol>	22 Lectures including guidance for practice session, preparations and actual conduct of program.

9. Pollution (Noise pollution / industrial pollution etc.)
10. Issues related to LGBT.
11. HIV –AIDS / Covid 19 etc.
12. Consumer Awareness (Act 2019), Need and Importance
13. E-waste management
14. Stress and Harassment.
15. Global warming
16. Importance of Ethics and Values
17. Old Age Homes / Status of Senior Citizens
18. Distance Education Opportunities
19. First Aid Awareness
20. Voting rights / Human Rights

**Learners will be oriented and motivated to participate in minimum four activities given below based on above topics:**

1. Seminar /conferences, discussion sessions, debate, rallies
2. Competitions (essay/creative writing, elocution, poster/ video/ rangoli making etc. – Minimum 2 competitions)
3. Extension Work group activities of other groups in the college.
4. Prepare your PPT, design your posters / charts.
5. Survey / short term academic courses / innovative programs.
6. Field visit / field work / case studies / developing innovative engineering models / projects
7. Participation in Street Plays
8. Event / hospitality / human resource management program /assignment
9. Novel formulation development (pharmacy),
10. Self-medication survey (pharmacy),

**Learners are required to prepare short videos (duration 3-4 minutes) of the activity where the college will organize such competition.**

	<p><b>The learners will be oriented about various career development opportunities in University of Mumbai, and schemes of student development by the Government.</b></p> <p><b><u>Learners will be oriented and given an opportunity for:</u></b></p> <ul style="list-style-type: none"> <li>- Script writing / Direction for street play.</li> <li>- Composing / Singing (Songs, Powada)</li> <li>- Playing Musical Instrument during the event.</li> <li>- Participation in various college and university level competitions.</li> <li>- Participate in Cultural Performance / Organising Committee for Festival / Programs / Event Management.</li> </ul>	
3	<p><b><u>Participation Video / Stage Performance / Assignment / Report Writing and submission</u></b></p> <ul style="list-style-type: none"> <li>- Present your report / video during the college program.</li> <li>- All learners enrolled in Extension Work can make activity video or stage performance (3-4 minutes duration) creating awareness about any social issues / topics enlisted here followed by assignment / report writing as per format.</li> <li>- <b>College will organise a program in the hall / classroom for all learners and give them an opportunity</b> to present their assignment / report with PPT / video presentation followed by question answer session / test / interview by the college.</li> </ul>	6 Lectures including guidance for practice session, preparations and actual conduct of program.

### **Evaluation Pattern**

#### **Internal Assessment**

<b>Sr. No.</b>	<b>Assessment Criteria</b>	<b>Maximum Marks</b>
1	Attendance, punctuality, completion of hours, participation in programs, presentations and feedback.	10
2	Proficiency in required skill sets, overall performance, submission of written report / assignments and expected development.	10
	Total	20 Marks

## **External Assessment**

**(Based on Extension Work guidelines and five enlisted topics chosen by the college.)**

### **Question Paper Pattern**

**Time: 1.00 Hours**

**Total Marks 30**

**Instructions: 1. All questions are compulsory.**

**2. Figures to the right indicate maximum marks.**

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Q.1. Rewrite the following statement by choosing correct alternative given below. - 06 Marks  
(6 statements. One mark each)

Q.2. Write short Notes On (Any Two out of Four) - 06 Marks

Q.3. Answer the following questions. (Any Three out of Five) - 18 Marks

#### **References:**

- Guidelines for Extension Work published by Department of Lifelong Learning and Extension, University of Mumbai.
- Agricultural Extension: Principles and Methods" by "Ray V. Herren (2008)
- Agricultural Extension by G. S. R. Murthy (2010)
- Introduction to Agricultural Extension by S. S. Acharya (2015)
- Agricultural Extension in Developing Countries by R. W. Snapp (2012)
- Extension Communication and Management by B. M. Panda (2016)

**Sign of BOS Chairman  
Prof. Kunal Jadhav  
Ad-hoc Board of  
Studies in Extension  
Work**

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