AC – 27/12/2023
Item No. – 6.8 (N)

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 20th 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	
1	**Title of program** **O: _____A**	**A**	**U.G. Certificate in Computer Science**
	O: _____B	**B**	**U.G. Diploma in Computer Science**
	O: _____C	**C**	**B.Sc. (Computer Science)**
	O: _____D	**D**	**B.Sc. (Hons.) in Computer Science**
	O: _____E	**E**	**B.Sc. (Hons. with Research) in Computer Science**
2	**Eligibility** **O: _____A**	**A**	A candidate for being eligible for admission must have passed **Higher Secondary School Certificate Examination** (Std. XII) in **Science stream** conducted by the Maharashtra State Board of Secondary and Higher Secondary Education with **Mathematics and Statistics as one of the subject** or its equivalent. Admission will be on merit, based on order of preference as follows: 1. Aggregate Marks at H.S.C. or equivalent. 2. Aggregate Marks in Science Group (Physics, Chemistry and Mathematics) 3. Marks in Mathematics and Statistics and Physics. Marks in Mathematics and Statistics. **OR** Passed Equivalent **Academic Level 4.0** with **Mathematics and Statistics as one of the subject**
	O: _____B	**B**	Under Graduate Certificate in Computer Science **OR** Passed Equivalent **Academic Level 4.5**
	O: _____C	**C**	Under Graduate Diploma in Computer Science **OR** Passed Equivalent **Academic Level 5.0**
	O: _____D	**D**	Bachelors of Science in Computer Science with minimum CGPA of 7.5 **OR** Passed Equivalent **Academic Level 5.5**

	O: _____E	**E**	Bachelors of Science in Computer Science with minimum CGPA of 7.5 **OR** Passed Equivalent **Academic Level 5.5**
3	**Duration of program** **R: _____**	**A**	One Year
		B	Two Years
		C	Three Years
		D	Four Years
		E	Four Years
4	**Intake Capacity** **R: _____**	**60 students per division**	
5	**Scheme of Examination** **R: _____**	NEP **40% Internal** **60% External**, Semester End Examination **Individual Passing** in Internal and External Examination	
6	**Standards of Passing** **R: _____**	**40%** in **each component**	
7	**Credit Structure** **Sem. I - R: _____A** **Sem. II - R: _____ B**	Attached herewith	
	Credit Structure **Sem. III - R: _____C** **Sem. IV - R: _____D**		
	Credit Structure **Sem. V - R: _____E** **Sem. VI - R: _____F**		
8	**Semesters**	**A**	Sem I & II
		B	Sem III & IV
		C	Sem V & VI
		D	Sem VII & VIII
		E	Sem VII & VIII
9	**Program Academic Level**	**A**	4.5
		B	5.0
		C	5.5
		D	6.0
		E	6.0
10	**Pattern**	Semester	
11	**Status**	New	
12	**To be implemented from Academic Year Progressively**	From Academic Year: 2024-25	

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

Sign of the BOS Chairman	**Sign of the Offg. Associate Dean**	**Sign of Offg. Dean**
Dr. Jyotshna Dongardive	**Dr. Madhav R. Rajwade**	**Prof. Shivram S. Garje**
Ad-hoc BOS (Computer Science)	Faculty of Science & Technology	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.

Credit Structure of the Program (Sem I)
Under Graduate Certificate in Computer Science

Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr. / Sem.	Degree/ Cum. Cr
1	**Mandatory**	**Electives**							
	6		-	2+2	VSC:2, SEC:2	AEC:2, VEC:2, IKS:2	CC:2	22	UG Certificate 44
	MJ1: Digital Systems & Architecture (TH) – 2 MJ2: Fundamentals of Database Systems (TH) – 2 MJP1: Computer Science Practical 1 (PR) – 2	-	-	**OE :** Stress Management 1 Entrepreneurship Management (OE)	**VSC:** Introduction to Programming with Python – 2 **SEC** – 02 Statistics with R Programming – 2 OR Linux Operating System – 2	**AEC:** Introduction to Communication Skills I (2) **VEC:** Indian Constitution (2) OR Law related to Intellectual Property Rights (2) **IKS:** Indian Knowledge System Series (Generic) -I	CC / Sports / NSS / Garba / Yoga		

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 Designing	**2**
SEC (any one)	Database Management Systems using PL/SQL	**2**
	Advanced Python Programming	

Sem – I

Mandatory Courses

Name of the Course: Digital System and Architecture

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** The Digital Systems and Architecture course serves as a foundational exploration into the fundamental principles governing digital systems and computer architecture. This course delves into the design and organization of digital circuits and systems that form the backbone of modern computing devices. **Relevance:** In the era of rapid technological advancement, understanding digital systems and architecture is paramount. From smartphones to supercomputers, digital systems are pervasive. This course is essential for anyone aspiring to comprehend the inner workings of these systems and contribute to their development. **Usefulness:** The course equips students with the knowledge and skills to design, analyze, and optimize digital systems. It serves as a gateway for students to explore various aspects of computer architecture, laying the groundwork for more advanced studies and applications in the field. **Application:** Knowledge gained in this course finds practical applications in diverse domains, including embedded systems, computer networks, signal processing, and beyond. Students will learn how to translate theoretical concepts into tangible solutions, bridging the gap between abstraction and real-world implementation. **Interest:** Digital System and Architecture is an intellectually stimulating course that captivates students with its blend of theoretical concepts and hands-on application. The allure of creating efficient and high-performing digital systems often sparks curiosity and enthusiasm among students. **Connection with Other Courses:** This course establishes crucial linkages with other courses in computer science. It provides a solid

		foundation for more advanced courses such as computer organization, microprocessor systems, and hardware description languages. The knowledge gained here forms a seamless continuum in the study of computer systems. **Demand in the Industry:** As the demand for faster, more efficient computing systems continues to rise, professionals well-versed in digital systems and architecture are highly sought after. Industries ranging from electronics and telecommunications to automotive and healthcare actively seek individuals with expertise in designing and optimizing digital systems. **Job Prospects:** Graduates with proficiency in digital systems and architecture find themselves well-positioned for a myriad of career opportunities. Roles may include digital design engineer, embedded systems developer, hardware architect, and systems analyst. The skills acquired in this course open doors to a wide array of industries where digital technology plays a pivotal role.
2	**Vertical:**	Major
3	**Type:**	Theory
4	**Credits:**	2 credits
5	**Hours Allotted:**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To understand fundamentals of Logic gates, Number system and Flip Flops. **CO 2.** To have an understanding of Digital System and Operation of a Digital Computer. **CO 3.** To Learn Different Architecture & Organization of memory system, processor organization and control unit. **CO 4.** Basic understanding of 8085 microprocessor and its applications.	
8	**Course Outcomes (OC):** After successful completion of this course, students would be able to - **OC 1.** Learn how number system and codes are useful in computer system design. **OC 2.** Learn how Flip Flops are useful in memory design and data communication through CPU and Memory and I/O devices. **OC 3.** Learn about basics of instruction sets and its types. **OC 4.** Learn about Processor Internal Architecture and Design.	

9	**Modules:-** **Module 1 (15 hours):**
	Fundamentals of Digital Logic: Boolean algebra, Logic Gates, Simplification of Logic Circuits: Algebraic Simplification, Karnaugh Maps. **Combinational Circuits:** Adders, Subtractors, Multiplexer, De-Multiplexer. **Sequential Circuits:** Flip- Flops (SR, JK & D), Counters: synchronous and asynchronous Counter. **Computer System:** Comparison of Computer Organization & Architecture, Computer Components and Functions, Interconnection Structures. Bus Interconnections, Input / Output: I/O Module Programmed I/O, Interrupt Driven I/O, Direct Memory Access.
	Module 2 (15 hours):
	Memory System Organization: Classification and design parameters, Memory Hierarchy, Internal Memory: RAM, SRAM and DRAM, Interleaved and Associative Memory. Cache Memory: Design Principles, Memory mappings, Replacement Algorithms, Cache performance, Cache Coherence. Virtual Memory, External Memory: Magnetic Discs, Optical Memory, Flash Memories, RAID Levels **Instructions:** Instruction Formats, Instruction Sets, Addressing Modes, Addressing Modes Examples with Assembly Language [8085/8086 CPU]. **Processor Organization:** Structure and Function. Register Organization [8085/8086 CPU]. Basic Microprocessor operations: Data Transfer (Register / Memory) Operations, Arithmetic & Logical Operations. Instruction Cycle, Instruction Pipelining. Introduction to RISC and CISC Architecture, Instruction Level Parallelism and Superscalar Processors, Design Issues.
10	**Text Books** 1. M. Mano, Computer System Architecture 3rd edition, Pearson 2. Carl Hamacher et al., Computer Organization and Embedded Systems, 6 ed., McGraw-Hill 2012 3. R P Jain, Modern Digital Electronics, Tata McGraw Hill Education Pvt. Ltd. , 4th Edition, 2010
11	**Reference Books** 1. William Stallings (2010), Computer Organization and Architecture-designing for performance, 8th edition, Prentice Hall, New Jersy. 2. Anrew S. Tanenbaum (2006), Structured Computer Organization, 5th edition, PearsonEducation Inc, 3. John P. Hayes (1998), Computer Architecture and Organization, 3rd edition, Tata McGrawHill 4. Ramesh Gaonkar (2013), Microprocessor Architecture, Programming and Application with 8085, 6^{th} edition, Penram.

<table>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>Continuous Evaluation through:
Class Test on Module 1: 10 marks
Class Test on Module 2: 10 marks
Average of 2 Class Tests: 10 marks
Assignment on Module 1: 5 marks
Assignment on Module 2: 5 marks
Total of 2 Assignments: 10 marks
Total: 20 marks</td><td>Evaluation through:
A Semester End Theory Examination of 1 hour duration for 30 marks as per the paper pattern given below.
Total: 30 marks</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper:

Total Marks: 30 Duration: 1 Hour
<table>
<tr><th>Question</th><th>Based On</th><th>Options</th><th>Marks</th></tr>
<tr><td>Q. 1</td><td>Module 1</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q. 2</td><td>Module 2</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q. 3</td><td>Module 1 & 2</td><td>Any 2 out of 4</td><td>10</td></tr>
</table></td></tr>
</table>

Name of the Course: Fundamentals of Database Systems

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** The Fundamentals of Database Systems course is a foundation in the study of information management and technology. It provides students with a comprehensive understanding of the principles, design, and implementation of databases, which are critical components in virtually every domain where data is utilized. **Relevance:** In today's data-driven world, the management and retrieval of information are paramount. This course is highly relevant as it addresses the core concepts essential for organizing, storing, and manipulating data efficiently. **Usefulness:** This course is immensely useful for individuals aspiring to work with data in various capacities. Whether designing databases, developing applications that interact with databases, or analyzing data trends, a solid understanding of database fundamentals is crucial. **Application:** The principles learned in this course find application across diverse sectors, including business, healthcare, finance, and technology. Students will gain the skills to model real-world scenarios, design efficient databases, and implement systems that store and retrieve information seamlessly. **Interest:** This course often attracts students due to its practical and tangible applications. The ability to structure and manage data effectively, ensuring its integrity and accessibility, can be intellectually stimulating and applicable to numerous real-world scenarios. **Connection with Other Courses:** This course forms a vital connection with various other courses in computer science and information technology. It is foundational to courses like database management, data warehousing, and data mining. Additionally, it complements courses related to software development, ensuring a holistic understanding of system architecture.

		Demand in the Industry: As businesses and organizations amass ever-growing volumes of data, there is an increasing demand for professionals versed in database systems. Industries such as finance, healthcare, e-commerce, and technology actively seek individuals who can design, implement, and manage robust databases. **Job Prospects:** Graduates proficient in the fundamentals of database systems enjoy promising job prospects. Potential roles include database administrator, data analyst, database developer, and business intelligence analyst. These professionals play a pivotal role in ensuring the efficient and secure management of an organization's data assets.
2	**Vertical:**	Major
3	**Type:**	Theory
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory)
5	**Hours Allotted:**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To make students aware fundamentals of database system. **CO 2.** To give idea how ERD components helpful in database design and implementation. **CO 3.** To experience the students working with database using MySQL. **CO 4.** To familiarize the student with normalization, database protection and different DCL Statements. **CO 5.** To make students aware about importance of protecting data from unauthorized users. **CO 6.** To make students aware of granting and revoking rights of data manipulation.	
8	**Course Outcomes (OC):** After successful completion of this course, students would be able to - **OC 1.** To appreciate the importance of database design. **OC 2.** Analyze database requirements and determine the entities involved in the system and their relationship to one another. **OC 3.** Write simple queries to MySQL related to String, Maths and Date Functions. **OC 4.** Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands. **OC 5.** Understand the normalization and its role in the database design process. **OC 6.** Handle data permissions. **OC 7.** Create indexes and understands the role of Indexes in optimization search.	

9	**Modules** **Module 1 (15 hours):**
	Introduction to DBMS: Database, DBMS – Definition, Overview of DBMS, Advantages of DBMS, Levels of abstraction, Data independence, DBMS Architecture **Data models**: Client/Server Architecture, Object Based Logical Model, Record Based Logical Model (relational, hierarchical, network **Entity Relationship Model and ER to Table:** Entities, attributes, entity sets, relations, relationship sets, Additional constraints (key constraints, participation constraints, weak entities, aggregation / generalization, Conceptual Design using ER (entities VS attributes, Entity Vs relationship, binary Vs ternary, constraints beyond ER) Entity to Table, Relationship to tables with and without key constraints. **DDL Statements:** Creating Databases, Using Databases, datatypes, Creating Tables (with integrity constraints – primary key, default, check, not null), Altering Tables, Renaming Tables, Dropping Tables, Truncating Tables **DML statements:** Viewing the structure of a table insert, update, delete, Select all columns, specific columns, unique records, conditional select, in clause, between clause, limit, aggregate functions (count, min, max, avg, sum), group by clause, having clause
	Module 2 (15 hours):
	Relational data model: Domains, attributes, Tuples and Relations, Relational Model Notation, Characteristics of Relations, Relational Constraints - primary key, referential integrity, unique constraint, Null constraint, Check constraint **Functions:** String Functions (concat, instr, left, right, mid, length, lcase/lower, ucase/upper, replace, strcmp, trim, ltrim, rtrim), Math Functions (abs, ceil, floor, mod, pow, sqrt, round, truncate) Date Functions(adddate, datediff, day, month, year, hour, min, sec, now, reverse) **Joining Tables and Subqueries**: inner join, outer join (left outer, right outer, full outer) subqueries with IN, EXISTS, subqueries restrictions, Nested subqueries, ANY/ALL clause, correlated subqueries **Normal forms:** Functional dependencies, first, second, third, and BCNF normal forms based on primary keys, lossless join decomposition. **Database Protection:** Security Issues, Threats to Databases, Security Mechanisms, Role of DBA, Discretionary Access Control, Backing Up and Restoring databases **Views**: Creating, altering dropping, renaming and manipulating views **DCL Statements:** Creating/dropping users, privileges introduction, granting/revoking privileges, viewing privileges), Transaction control commands – Commit, Rollback

<table>
<tr><td>10</td><td colspan="2">Text Books
1. Fundamentals of Database System, ElmasriRamez, NavatheShamkant, Pearson Education, Seventh edition, 2017
2. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke, 3rd Edition,2014
3. Murach's MySQL, Joel Murach, 3rd Edition, 3rd Edition, 2019</td></tr>
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1. Database System Concepts, Abraham Silberschatz, HenryF.Korth, S.Sudarshan, McGraw Hill,2017
2. MySQL: The Complete Reference, VikramVaswani , McGraw Hill, 2017
3. Learn SQL with MySQL: Retrieve and Manipulate Data Using SQL Commands with Ease, Ashwin Pajankar, BPB Publications, 2020</td></tr>
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</table></td></tr>
</table>

Name of the Course: Computer Science Practical 1

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** The Major Computer Science Practical Course, encompassing Digital Systems and Architecture as well as Database Systems, is a comprehensive and hands-on exploration into the foundational aspects of both hardware and software that underpin modern computing. This practical course is designed to provide students with a holistic understanding of digital systems, computer architecture, and the effective management of data within databases. **Relevance:** In an era where seamless integration of hardware and software is pivotal, the combination of Digital Systems and Architecture with Database Systems is highly relevant. This practical course addresses the symbiotic relationship between the two, offering students a holistic perspective on building robust computing solutions. **Usefulness:** This course is immensely useful for students aiming to bridge the gap between hardware and software. By integrating digital systems with database concepts, students gain a unique skill set that enables them to design, implement, and optimize computing systems comprehensively. **Application:** The skills acquired in this practical course find direct application in the development of efficient and integrated computing solutions. Students learn to design digital systems, optimize hardware performance, and seamlessly integrate these systems with databases to handle and manipulate data effectively. **Interest:** The Major Computer Science Practical Course is designed to spark interest by offering a hands-on approach to both hardware and software components. Students engage in practical exercises that involve designing digital circuits, implementing database solutions, and integrating these components, fostering a deeper understanding and appreciation for the intricacies of computing systems.

		Connection with Other Courses: This practical course serves as a nexus, connecting various other courses in the computer science curriculum. It lays a foundation for advanced courses in computer organization, embedded systems, software engineering, and database management. The integrated approach ensures students comprehend the synergies between different aspects of computer science. **Demand in the Industry:** Professionals who can seamlessly navigate both digital systems and database management are in high demand. Industries ranging from electronics and telecommunications to software development and data analytics actively seek individuals proficient in both hardware and software aspects, recognizing the practical value of this dual expertise. **Job Prospects:** Graduates from this practical course enjoy promising job prospects in roles that require a holistic understanding of computing systems. Potential job titles include systems architect, database administrator, embedded systems developer, and hardware-software integration specialist. These professionals are well-positioned to contribute to diverse industries seeking comprehensive computing solutions.
2	**Vertical:**	Major
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To verify the truth tables of various logic gates **CO 2.** Develop proficiency in designing and implementing digital circuits. **CO 3.** Explore various components of digital systems, including processors, memory units, and input/output interfaces. **CO 4.** Develop skills in designing and creating relational databases. **CO 5.** Explore the principles of database querying using SQL. **CO 6.** Gain practical knowledge of transaction management and data control in database systems.	

8	**Course Outcomes (OC):** After successful completion of this course, students would be able to - **OC 1.** Verify truth tables of various logic gates **OC 2.** Simplify given Boolean expressions and implement them using Logisim. **OC 3.** Design and validate the operation of various combinational circuits using Logisim. **OC 4.** Understand the behavior and applications of flip-flops in digital systems. **OC 5.** Design and implement expressions using multiplexers/demultiplexers in Logisim. **OC 6.** Create and maintain relational databases, applying normalization principles. **OC 7.** Write simple queries to MySQL related to String, Maths and Date Functions. **OC 8.** Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands. **OC 9.** Handle data permissions.
9	**Modules:-** **Module 1 (30 hours):**
	Digital Systems & Architecture – Practical **Logic Gates Truth Table Verification:** Study and verify the truth table of various logic gates (NOT, AND, OR, NAND, NOR, EX-OR, EX-NOR) using Logisim. **Boolean Expression Simplification:** Simplify given Boolean expressions and realize them using Logisim. **Half/Full Adder Design:** Design and verify the operation of a half/full adder using Logisim. **Half/Full Subtractor Design:** Design and verify the operation of a half/full subtractor using Logisim. **4-Bit Magnitude Comparator:** Design a 4-bit magnitude comparator using combinational circuits in Logisim. **Flip-Flop Implementation:** Verify the operation of flip-flops (e.g., D, JK) using logic gates in Logisim. **Counter Operation Verification:** Verify the operation of a counter using Logisim. **4-Bit Shift Register Operation:** Verify the operation of a 4-bit shift register using Logisim. **Multiplexer/Demultiplexer Design:** Design and implement expressions using multiplexers/demultiplexers in Logisim.

	3-Bit Binary Ripple Counter: Design and implement a 3-bit binary ripple counter using JK flip-flops in Logisim. The above practical can be performed using any open source simulator (like Logisim) (Download it from https://sourceforge.net/projects/circuit/)
	Module 2 (30 hours):
	Fundamentals of Database Systems – Practical **Conceptual Design Using ER Diagrams:** Identify entities, attributes, keys, and relationships. Apply generalization and specialization. **Database Management Operations:** View all databases, create a database, view all tables in a database, create tables with and without constraints, perform CRUD operations. **Table Management Operations:** Alter a table, drop/truncate/rename tables, perform backup/restore operations on a database. **Basic Queries and Aggregate Functions:** Execute simple queries and utilize aggregate functions (e.g., COUNT, SUM, AVG). **Advanced Query Functions:** Utilize date, string, and math functions in queries. **Join Queries:** Execute inner and outer join queries. **Subqueries:** Apply subqueries with IN and EXISTS clauses. **ER Model to Relational Model Conversion and Normalization:** Convert ER model to a relational model and apply normalization up to 3rd Normal Form. **Views:** Create views with and without check options, drop views, select data from views. **Data Control Language (DCL) Statements:** Implement DCL statements for granting and revoking permissions. Demonstrate COMMIT and ROLLBACK statements. These experiments can be implemented using a database management system like MySQL.

<table>
<tr><td>10</td><td colspan="2">Text Books
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2. Murach's MySQL, Joel Murach, 3rd Edition, 3rd Edition, 2019</td></tr>
<tr><td>11</td><td colspan="2">Reference Books
1. MySQL: The Complete Reference, VikramVaswani , McGraw Hill, 2017
2. Learn SQL with MySQL: Retrieve and Manipulate Data Using SQL Commands with Ease, Ashwin Pajankar, BPB Publications, 2020</td></tr>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>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.
Total: 20 marks</td><td>A Semester End Practical Examination of 2 hours duration for 30 marks as per the paper pattern given below.

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<tr><td>Q. 3</td><td>Viva</td><td>06</td></tr>
</table></td></tr>
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Vocational & Skill Enhancement Courses (VSEC)

Name of the Course: Introduction to Programming with Python

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** Introduction to Programming with Python Course serves as an entry point into the world of coding, introducing learners to the versatile and beginner-friendly Python language. Python is renowned for its readability and simplicity, making it an ideal choice for individuals taking their first steps in programming. **Relevance:** In today's digital era, programming skills are increasingly essential across various disciplines. Python, being an interpreted, high-level language, is relevant for diverse applications, from web development and data analysis to artificial intelligence and automation. **Usefulness:** The course provides a foundational understanding of Python syntax, data structures, and control flow, empowering learners to write functional and efficient code. Python's broad applicability makes the skills acquired in this course valuable for numerous programming tasks. **Application:** Upon completion, participants can apply Python to solve real-world problems, automate repetitive tasks, and create simple applications. The practical knowledge gained serves as a stepping stone for more advanced Python courses or specialization in areas like data science or web development. **Interest:** Python's user-friendly syntax and extensive libraries make it an enjoyable language for beginners. The course is designed to spark interest by combining theory with hands-on projects, fostering a passion for coding and problem-solving. **Connection with Other Courses:** Python is a gateway language that seamlessly integrates with other programming languages and technologies. The skills acquired in a Basic Python Programming Course

		provide a solid foundation for advanced programming languages and specialized courses in data science, machine learning, and more. **Demand in the Industry:** Python's popularity in the industry is soaring. Its versatility, readability, and extensive community support have led to its widespread adoption. Professionals proficient in Python are in high demand across various sectors, including technology, finance, healthcare, and academia. **Job Prospects:** Completion of this Course opens doors to entry-level positions in software development, quality assurance, data analysis, and scripting. Python developers are sought after for their ability to quickly prototype solutions and contribute to various stages of software development.
2	**Vertical:**	VSC
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** Master Python features, execution, and diverse data types. **CO 2.** Demonstrate expertise in if statements, loops, and control statements. **CO 3.** Efficiently create and manipulate arrays, strings, and data structures. **CO 4.** Apply functions, modules, and strings for versatile programming tasks. **CO 5.** Effectively manage files, utilize regular expressions, and work with date and time.	
8	**Course Outcomes (OC):** **OC 1.** Apply Python features for diverse programming tasks confidently. **OC 2.** Implement control flow statements for precise program execution. **OC 3.** Manipulate arrays, strings, and data structures with precision and ease. **OC 4.** Create modular, efficient code using functions, modules, and strings. **OC 5.** Skillfully manage files, utilize regular expressions, and work with date and time for program efficiency.	
9	**Modules:-** **Module (30 hours):**	
	Overview and Basic Elements of Python Programming: Features of Python, Execution of a Python Program, Flavours of Python, Innards of Python, Python Interpreter, Comments, Docstrings, IDLE, Data types, Dictionary, Sets, Mapping, Basic Elements of Python, Variables, Input Function, Output Statements, Command	

	Line Arguments. Operators, Precedence of Operators, Associativity of Operators **Control Statements:** The if statement, The if … else Statement, The if … elif … else Statement, Loop Statement- while loop, for loop, Infinite loop, Nested loop, The else suite, break statement, continue statement, pass statement, assert statement, return statement. **Arrays:** Creating Arrays, Indexing and Slicing of Arrays, Basic Array Operations, Arrays Processing, Mathematical Operations on Array, Aliasing Arrays, Slicing and Indexing in NumPy Arrays, Basic slicing, Advanced Indexing, Dimensions and Attributes of an Array **Functions:** Function definition and call, Returning Results, Returning Multiple Values from a Function, Built-in Functions, Difference between a Function and a Method, Pass Value by Object Reference, Parameters and Arguments, Recursive Functions, Anonymous or Lambda Functions. Modules in Python. **Strings:** Creating Strings, Functions of Strings, Working with Strings, Formatting Strings, Finding the Number of Characters and Words, Inserting Substrings into a String.
	Module (30 hours):
	Exploring List, Tuples and Dictionaries: Lists, List Functions and Methods, List Operations, List Slices, Nested Lists, Tuples, Functions in Tuple. **Working with Dictionaries:** Creating a Dictionary, Operators in Dictionary, Dictionary Methods, Using for Loop with Dictionaries, Operations on Dictionaries **Files in Python**: Opening and Closing a File, Working with Text Files, , Working with Binary Files, The 'with' statement, Pickle in Python, The seek() and tell() Methods, Random Accessing of Binary Files, Zipping and Unzipping Files, Working with Directories **Regular Expressions:** Introduction, Sequence Characters in Regular Expressions, Special Characters in Regular Expressions, Using Regular Expression on Files, Retrieving Information from an HTML File **Date And Time in Python:** Time, Date, Date and Time Now, combining date and times, formatting date and time, Finding and comparing dates, Sorting dates, Knowing the Time taken by a Program, Working with Calendar Module
10	**Text Books** 1. Practical Programming: An Introduction to Computer Science Using Python 3, Paul Gries , Jennifer Campbell, Jason Montojo, Pragmatic Bookshelf, 2nd Edition, 2014 2. Programming through Python, M. T Savaliya, R. K. Maurya & G M Magar, Sybgen Learning India, 2020
11	**Reference Books** 1. Python: The Complete Reference, Martin C. Brown, McGraw Hill, 2018 2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2017

<table>
<tr><td></td><td colspan="2">3. Programming in Python 3, Mark Summerfield, Pearson Education, 2nd Ed, 2018
4. Python Programming: Using Problem Solving Approach, ReemaThareja, Oxford Univeristy Press, 2017
5. Let Us Python, Yashwant. B. Kanetkar, BPB Publication, 2019</td></tr>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
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</table></td></tr>
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Name of the Course: Statistics with R Programming

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** This course provides an immersive exploration into the world of statistical computing and data analysis. Developed specifically for statistical computing and graphics, R is an open-source language that has become a standard tool for professionals in various fields. **Relevance:** In the era of big data and analytics, R programming is highly relevant. It is widely used for statistical modeling, data visualization, and machine learning, making it an indispensable skill for individuals in data-centric roles. **Usefulness:** The course equips participants with the ability to manipulate data, perform statistical analyses, and create visualizations. R's versatility makes it valuable for both beginners entering the field and seasoned professionals enhancing their analytical toolkit. **Application:** R programming finds application across diverse domains, including finance, healthcare, marketing, and academia. Participants can apply R to solve real-world problems, extract insights from data, and make informed decisions. **Interest:** The R programming course often sparks interest due to its hands-on nature. Participants engage in practical exercises, exploring datasets, creating visualizations, and developing statistical models, fostering a deep understanding of data analytics. **Connection with Other Courses:** This course forms a symbiotic connection with other data-centric courses. It complements studies in statistics, machine learning, and data science, providing a foundation for advanced analytics. **Demand in the Industry:** Professionals with R programming skills are in high demand. Industries ranging from finance to healthcare seek individuals who can leverage R for data analysis and

		decision-making, contributing to evidence-based practices. **Job Prospects:** Graduates from an R programming course find diverse job prospects. Roles may include data analyst, statistician, business intelligence analyst, and data scientist. These professionals are sought after for their ability to derive actionable insights from data.
2	**Vertical:**	SEC
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** Understand R basics, set up R Studio, and customize the environment.. **CO 2.** Master R expressions, assignments, loops, and decision-making. **CO 3.** Develop proficiency in using R data structures: vectors, matrices, lists, and data frames. **CO 4.** Demonstrate expertise in character strings manipulation in R. **CO 5.** Apply built-in statistical functions, regression analysis, and distribution functions fluently.	
8	**Course Outcomes (OC):** **OC 1.** Confidently navigate Studio, R GUI, and manage data in R. **OC 2.** Fluent implementation of expressions, assignments, and loops in R. **OC 3.** Use R data structures for effective data management. **OC 4.** Efficiently manipulate and operate on character strings in R. **OC 5.** Apply statistical functions, regression analysis, and distribution functions with confidence.	
9	**Modules:-** **Module 1 (30 hours):**	
	Exploring R Language and Setting Up environment: Introduction to R, Terminologies in R, R Environment, Installing R, Studio, and R Commander, Customizing Studio, Data Management in Studio, R Graphical User Interface (R GUI), Working with R Scripts **Implementing ting Expression:** Expressions, assignment, Decision making, Loops, data and time options in R **Essential Data Structures in R:** Vectors, Matrix, Arrays, Lists, Data frames, Functions **Implementing Strings in R**: Character strings in R, Character Strings, , Strings and R objects, String Manipulation: Printing Characters, Basic String Manipulations, String Operations	

<table>
<tr><td></td><td colspan="2">Module 2 (30 hours):</td></tr>
<tr><td></td><td colspan="2">Built-in statistical functions in R: mean() function, Median, Standard Deviation, Some other built-in statistical functions,

Regression Analysis: Regression Analysis-Linear Regression and Multiple Regression, Normal Distribution- dnorm(),,pnorm(),qnorm(),rnorm()

Binomial Distribution: dbinom(),pbinom(),qbinom(),rbinom() Functions, Time Series Analysis

Visualizing and analysing Data in R: Tabulation, Contingency Tables, Making R Contingency Tables, Making R Custom Contingency Tables, Selection of Parts in a Table Object, Conversion of an Object into the Table, Testing Table Objects, Making R Complex Tables, Representing data through Cross Tabulation

Graphical Models & analysis: Plots made of Single Plots made of Two Variables , Variable, Plots made of Multiple Variables, Special Plots, Storing Graphics</td></tr>
<tr><td>10</td><td colspan="2">Text Books
1. Statistical Programming in R, K.G. Srinivasa G.M. Siddesh,Chetan Shetty , Oxford University Press, 2017
2. Learning R: A Language for Data Analytics and Visualization, Sybgen Learning, R. K. Maurya, 2021
3. Introduction to Statistics and Data Analysis With Exercises, Solutions and Applications in R: Heumann, Christian, Schomaker, Michael, Shalabh, Publisher” Springer 2016</td></tr>
<tr><td>11</td><td colspan="2">Reference Books
1. Learning R Programming, Kun Ren, Packt Publishing, 2018
2. R Programming for Statistics and Data Science(Video), 365 Careers, Packt, 2018
3. R Programming Fundamentals, Kaelen Medeiros, Oreily-Packt Publishing</td></tr>
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Name of the Course: LINUX Operating System

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** The Linux Operating System course is a foundational exploration into the world of computing, providing students with essential knowledge about this open-source and widely used operating system. **Relevance:** Linux is integral to various industries, from server administration to software development, cybersecurity, cloud computing, and IoT, making the course highly relevant in today's digital landscape. **Usefulness:** Linux dominates global server environments, making it a crucial skill for managing and maintaining servers efficiently. Many development tools and environments are Linux-based, enhancing a developer's capabilities. Linux, well-known for its robust security features, plays a pivotal role in the field of cybersecurity, making Linux knowledge invaluable for professionals in this domain. Popular cloud platforms extensively use Linux, making familiarity with it beneficial for cloud administrators. Linux's prevalence in IoT devices and embedded systems underscores its importance for professionals working in these emerging fields. **Application:** The course introduces students to the core principles and practical applications of Linux, covering areas such as server administration, software development, cybersecurity, cloud computing, and IoT. **Interest:** With its open-source nature and versatile applications, Linux attracts individuals who appreciate efficient command-line tools and those interested in stability, reliability, and the command-line interface. **Connection with Other Courses:** The course seamlessly integrates with network administration courses by incorporating essential Linux commands. It also aligns with various software development courses, fostering a comprehensive

		understanding of computing environments. **Demand in the Industry:** The industry recognizes the stability, security, and cost-effectiveness of Linux, resulting in a consistently high demand for professionals with Linux expertise. **Job Prospects:** Graduates of the Linux Operating System course are well-positioned for diverse roles, including system administrators, network administrators, DevOps engineers, cloud administrators, cybersecurity analysts, and software developers.
2	**Vertical:**	SEC
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To learn basic concepts of Linux in terms of operating system **CO 2.** To learn use of various shell commands with regular expressions **CO 3.** To set Linux Environment variables and learn setting file permissions to maintain Linux security implementation **CO 4.** To learn various editors available in Linux OS and learn shell scripting. **CO 5.** To learn installation of compilers and programming using C and Python languages on Linux platform.	
8	**Course Outcomes (OC):** **OC 1.** Work with Linux file system structure, Linux Environment **OC 2.** Handle shell commands for scripting, with features of regular expressions, redirections **OC 3.** Implement file security permissions **OC 4.** Work with vi, sed and awk editors for shell scripting using various control structures **OC 5.** Install software like compilers and develop programs in C and Python programming languages on Linux Platform	
9	**Modules:-** **Module (30 hours):**	
	Introduction to Linux Operating System and Basics: History of Linux, GNU Info and Utilities, Various Linux Distributions, The Unix/Linux architecture, Features of Unix/Linux **Installation of Ubuntu Linux Operating System:** Booting and Installing from USB/DVD, Using Ubuntu Software Center / Using Synaptic, Exploring useful	

	software packages **Becoming an Ubuntu Power User:** Administering system and user settings, Learning Unity keyboard shortcuts, Using the Terminal **Linux Basics:** Starting the shell, Shell prompt, Command structure, File Systems and Directory Structure, man pages, more documentation pages **File System Commands:** touch, help, man, more, less, pwd, cd, mkdir, rmdir, ls, find, etc. **File Handling Commands:** cat, cp, rm, mv, more, file, wc, od, cmp, diff, comm, gzip, gunzip, zip, unzip, tar, ln, umask, etc. **General Purpose Utility Commands:** cal, date, echo, man, printf, passwd, script, who, uname, tty, stty, etc. **Linux File Permissions:** Understanding Linux file permissions, Using Linux groups. Decoding file permissions, Changing security settings, chmod, chown, chgrp
	Module (30 hours):
	Linux Security: Understanding Linux Security, Uses of root, sudo command, Working with passwords, Understanding ssh **Networking Commands:** who, whoami, ping, telnet, ftp, ssh, etc. **Editors:** vi, sed, awk **Simple Filters and I/O Redirection**: head, tail, cut, paste, sort, grep family, tee, uniq, tr, etc. **Shell Scripting:** Defining variables, reading user input, exit and exit status commands, expr, test, [], if conditional, logical operators, Conditions (for loop, until loop, and while loop), arithmetic operations, Redirecting input/output in scripts, creating your own redirection. **Working and Managing Processes:** sh, ps, kill, nice, at, batch, etc. **Job scheduling commands:** ps, nice, renice, at, batch, cron table Installation of C/C++/Java/Python Compiler and Environment Setup and Basic programming using C and Python languages.
10	**Text Books** 1. Linux Command line and Shell Scripting Bible, Richard Blum, Wiley India. 2. Unix: Concepts and Applications, Sumitabha Das, 4th Edition, McGraw Hill. 3. Official Ubuntu Book, Matthew Helmke& Elizabeth K. Joseph with Jose Antonio Rey and Philips Ballew, 8th Ed.
11	**Reference Books** 1. Linux Administration: A Beginner's Guide, Fifth Edition, Wale Soyinka, Tata McGraw-Hill, 2008. 2. Linux: Complete Reference, Richard Petersen, 6th Edition, Tata McGraw-Hill 3. Beginning Linux Programming, Neil Mathew, 4th Edition, Wiley Publishing, 2008.

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OPEN ELECTIVE SYLLABUS

AC – 20.04.2024
Item No. – 5.4 (N) Sem I (7a)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of OE	
Board of Studies in Psychology	
UG First Year Programme	
Semester	**I**
Title of Paper	**Credits 2/ 4**
I) Stress Management I	**2**
From the Academic Year	**2024-25**

OE1: Stress Management I

Sr. No.	Heading	Particulars
1	**Description the course:** **Including but Not limited to:**	The course is designed to understand stress, response to stress, coping and various coping mechanisms that people in general use in various settings in life. It introduces to a important connection between stress and stress management with physical and mental health. The course provides a guideline for managing stress in work, family and personal life. It also tries to bring upon aspects of Indian life and its association with stress and its management. Various interventions discussed are useful for people in general and psychologist and in particular. The four units include stress and stress psychophysiology and Stress and Illness/Disease and Intervention; Intrapersonal and interpersonal life-situation Interventions and Relaxation techniques; Exercise and strategies for decreasing stressful behaviors and Occupational Stress; Stress: Family and Elderly
2	**Vertical :**	~~Major/Minor~~/ Open Elective /~~Skill Enhancement / Ability Enhancement/Indian Knowledge System~~
3	**Type :**	Theory
4	**Credit**:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: 1) To understand concept of stress 2) To impart knowledge and understanding of the basic concepts and modern trends in Stress Management 3) To foster interest in Stress Management as a field of study and research 4) To make the students aware of the practical applications of the various concepts in Stress Management in daily life, in the Indian context 5) To learn about psychophysiology and Stress and Illness/Disease	

8	**Course Outcomes**: 1) Students are able to find and explain various concepts of stress. 2) Students can explain the role of psycho physiology plays in stress, illness and disease. Students can give example and site researches for the same. 3) Students can compare different types of stressors and contrast to them to different kind of situations. 4) Students can explain Intrapersonal and interpersonal Interventions to manage stress.
9	**Modules**:-
	Module 1: Stress and stress psychophysiology and Stress and Illness/Disease and Intervention (15 Hours)
	1. The pioneers, stress theory, the stressor, stress reactivity, definition of stress, stress management goals 2. Stress psychophysiology: Brain, Endocrine system, autonomic nervous system, cardiovascular system, gastrointestinal system, muscles and skin, symptoms and stress 3. Hot reactors, psychosomatic disease, stress and the immunological system, stress and serum cholesterol, specific conditions, posttraumatic stress disorder, stress and other conditions **4.** Intervention: a model of stress, setting up roadblocks, comprehensive stress management, eustress and a model, taking control and making a commitment
	Module 2: Intrapersonal and interpersonal life-situation Interventions and Relaxation techniques (15 Hours)
	1. Intrapersonal Interventions: eliminating unnecessary stressors, nutrition and stress, noise and stress, life events and stress, hassles and chronic stress, success analysis 2. Interpersonal Interventions: asserting oneself, Conflict resolution, communication, time management, social support networking 3. Meditation and autogenic training and Imagery 4. Progressive relaxation, biofeedback and other relaxation techniques
10	**Text Books:** Greenberg, J. S. (2008). Comprehensive Stress Management. (10th ed). New York: McGraw Hill publications.
11	**Reference Books:** 1) Olpin, M. & Hesson, M. (2021). Stress Management for Life: A Research-Based Experiential Approach. 5th Edition 2) Bam, B. P. (2008). Winning Habits: Techniques for Excellence in Sports. New Delhi: Pearson Power, Dorling Kindersley India pvt ltd. 3) Hariharan, M., & Rath, R. (2008). Coping with Life Stress: The Indian Experience. New Delhi: Sage publications India pvt ltd. 4) Rice, P.L. (1999). Stress and Health. (3rd ed). Brooks/Cole publishing co.

12	**Internal Continuous Assessment: 40%** **20 Marks**	**External, Semester End Examination 60%** **Individual Passing in Internal and External Examination :** **30 Marks**
13	**Continuous Evaluation through: (20 marks)** **a) Question Paper Pattern for Class Test Examination (10 Marks)** **1.** Fill in the Blanks/ match pairs/ MCQ/True False (All are compulsory): **5 Marks** **2.** Short Notes (Any Three out of Five) **5 Marks** **b) Completion of following activities as a part of CIE (10 Marks)** Classroom Presentations/ Assignments /Movie Review / Essay Submission/ Book review/ Field Visit Report / Educational Activity Report/ Presentation / Role play/ creative writing assignment: **10 Marks**	
14	**(B) External / Semester End Examination Marks: 30 Time: 1 Hours** **Each question is for 15 marks. Two out of Three questions to be attempted.** Q.1 Fill in the blanks (Based on all units). Marks 15 Q.2 Essay Type Questions (Based on Unit I). Marks 15 Q.3 Essay Type Questions (Based on Unit II). Marks 15	

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

AC – 20/04/2024
Item No. – 7.7 Sem. I (1b)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of OE	
Board of Studies in Commerce	
UG First Year Programme	
Semester	**I**
Title of Paper	**Credits 2**
I) Entrepreneurship Management	**Credits 2**
2)	
From the Academic Year	**2024-25**

OE Sem 1

ENTREPRENEURSHIP MANAGEMENT

PROGRAM	**B.COM**
SEMESTER	**I**
COURSE TITLE	**ENTREPRENEURSHIP MANAGEMENT**
VERTICLE /CATEGORY	**OE**
COURSE LEVEL	**4.5**
COURSE CODE	
COURSE CREDIT	**2**
HOURS PER WEEK THEORY	**2**
HOURS PER WEEK PRACTICAL/TUTORIAL	NA

COURSE OBJECTIVE
This course provides an overview of the business, understanding and significance of the business in economy.
COURSE OUTCOME
CO1: Learners will recognize the fundamental components of the business
CO2: Evaluate the impact of traditional and modern business activities
CO3: Learners will be able to apply theoretical knowledge to real world scenarios within the business sector.
CO4: To create comprehensive understanding of the risks and challenges associated with business world

ORGANISATION OF THE COURSE

UNIT NO	COURSE UNITS AT A GLANCE	TOTAL HOURS
1	Introduction to Entrepreneurship	15
2	Entrepreneurship Management	15
	TOTAL HOURS	30

COURSE DESIGN

Unit 1 : Introduction to Entrepreneurship (15)

- Introduction: Concept and importance of entrepreneurship, factors Contributing to Growth of Entrepreneurship, Entrepreneur and Manager, Entrepreneur and Intrapreneur, Types of Entrepreneurs
- Competencies of an Entrepreneur, Entrepreneurship Training and Development centers in India. Incentives to Entrepreneurs in India. Options available to entrepreneurs- franchising and outsourcing. Cases on takeover, mergers and acquisitions in India and at global level. Women Entrepreneurs: Problems and Promotion. Social Entrepreneurship-Definition, importance

PEDAGOGICAL APPROACH: Lecture Method. Case studies, assignment

Unit 2: ENTREPRENEURSHIP MANAGEMENT (15)

- Idea generation – sources and methods Identification and classification of ideas. Environmental Scanning and SWOT analysis Preparation of project plan – Components of an ideal business plan – market plan, financial plans, operational plan, and HR plan. Project formulation – project report significance and content
- Meaning and definition (evolution) Role and importance, Policies governing SMEs Organizational structure Steps in setting up a small unit,

PEDAGOGICAL APPROACH: Lecture Method, Assignments and Visits

REFERENCES:-

1. Small scale industries and entrepreneurship, Dr. Vasant Desai, Himalayan Publishing House
2. Management of small scale industries, Dr. Vasant Desai, Himalayan Publishing House
3. Management of small scale industries, J.C. Saboo Megha Biyani, Himalayan Publishing House
4. Dynamics of entrepreneurial development and Management, Dr. Vasant Desai, Himalayan Publishing
5. Entrepreneurship development, Moharanas and Dash C.R., RBSA Publishing, Jaipur
6. Beyond entrepreneurship, Collins and Lazier W, Prentice Hall, New Jersey, 1992
7. Entrepreneurship, Hisrich Peters Shephard, Tata McGraw Hill
8. Fundamentals of entrepreneurship, S.K. Mohanty, Prentice Hall of India
9. A Guide to Entrepreneurship, David Oates, Jaico Publishing House, Mumbai, Edn 2009

Total 50 Marks: with 2 Credits
30 Marks External and 20 Marks Internal

30 Marks External

DURATION: 1 Hour MARKS: 30

Any 2 out of 3

Q. 1 Answer the following (15 Marks)
a.
b.

Q. 2 Answer the following (15 Marks)
a.
b.

Q. 3 Answer the following (15 Marks)
a.
b.

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20 Marks Internal

1) Class Test (05 Marks)
2) Assignment (05 Marks)
3) Presentation (05 Marks)
4) Group Discussion (05 Marks)
5) Quiz (05 Marks)
6) Case Study (05 Marks)

Note: 1) Any Four out of the above can be taken for the internal Assessment.
2) The internal Assessment shall be conducted throughout the Semester.

Sign of the BOS Chairperson Prof. Dr. Kishori Bhagat BOS in Commerce	**Sign of the Offg. Associate Dean Dr. Ravikant Balkrishna Sangurde Faculty of Commerce & Management**	**Sign of the Offg. Associate Dean Prof. Dr. Kishori Bhagat Faculty of Commerce & Management**	**Sign of the Offg. Dean Prof. Kavita Laghate Faculty of Commerce & Management**

ABILITY ENHANCEMENT COURSE SYLLABUS

AC –20.04.2024
Item No. –5.6 (N) Sem I (1a)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of AEC	
Board of Studies in English	
UG First Year Programme B.Sc	
Semester	**I**
Title of Paper	**Credits**
Introduction to Communication **Skills in English I**	**2**
From the Academic Year	**2024-2025**

Sr. No.	Heading	Particulars
1	**Description of the course: Including but Not limited to:**	**Introduction to Communication Skills in English I** Effective academic communication skills are essential for success in scholarly pursuits. In the academic realm, proficiency extends beyond verbal articulation to encompass precise and coherent written expression. Students are not only required to engage in thoughtful discussions and articulate complex ideas verbally but must also demonstrate their understanding through well-crafted written assignments, and presentations. Academic communication involves the mastery of scholarly conventions, such as adherence to academic writing styles, and the ability to engage in dialogue with peers and scholars. It encompasses the skillful navigation of academic discourse, fostering an environment where ideas are shared, challenged, and refined. Developing strong academic communication skills empower individuals to contribute meaningfully to intellectual conversations, enriching both their academic journey and the broader scholarly community. This course with its 30:20 pattern will also help in accomplishing this goal. The course is aimed at honing their cognitive, analytical, linguistic and creative skills. It is hoped that by the end of the academic year, the learners will have developed confidence in using the English language both for oral and written communication as well as develop interest in enhancing these skills later on.
2	**Vertical:**	AEC (Ability Enhancement Course)
3	**Type:**	Theory
4	**Credit**:	2 credits (1credit=15 Hours for Theory in a semester)
5	**Hours Allotted:**	30Hours
6	**Marks Allotted**:	50Marks
7	**Course Objectives:** 1. To cultivate a comprehensive understanding of communication skills 2. To enhance reading proficiency with a diverse range of written texts with different genres and styles of written communication. 3. To develop proficiency in grammatical accuracy with specific focus on common grammatical errors and provide targeted exercises for improvement. 4. To equip learners with proficient presentation and conversation skills by integrating practical exercises for public speaking and interpersonal communication. 5. To provide practical experience in formal writing, including Statement of Purpose (SoP) preparation.	

8	**Course Outcomes**: At the end of the course, learners will: • Demonstrate an understanding of essential aspects of communication skills • Exhibit the ability to Read a variety of written text using subskills such as skimming and scanning. • Identify and rectify common grammatical errors in English. • Show competence in delivering compelling presentations and engage in articulate and effective conversations in English across different contexts. • Display advanced formal writing skills in crafting job application letters, CVs, and Statements of Purpose.

9	**Modules**: -
	Module1: (15 Lectures)
	A) Introduction to Communication Skills • The Seven Cs of Effective Communication • Verbal and Non-Verbal Communication • Cross-cultural communication • Technology-enabled Business Communication • Features of Effective Written Communication • Characteristics of an Effective Speech • Effective Listening Skills **B) Reading Skills:** • Scanning a text for information • Skimming a passage to look for main ideas, understanding text type • Guessing meaning of an expression (word/phrase/clause) • Building inference skills Passages from academic, professional, and literary domains around 200- 250 words, could be chosen in this section. **C) Grammar** • Subject Verb Agreement • Tenses • Question Tag • Change the Voice • Framing Interrogative sentence • Synonyms and Antonyms • Misplaced modifiers Grammar should be taught with a remedial approach so as to enable learners to avoid common errors in their written and spoken communication.

	Module 2: (15 Lectures)
	A) Speaking Skills in English **Conversation skills** • Opening a conversation • Introducing oneself in various contexts • Introducing others formally and informally **Presentation Skills** • Introduction: Essentials of Presentation skills • Analysis of model Presentations • Planning and Delivering the Presentation • Developing & Displaying Visual Aids • Handling Questions from the Audience **B) Formal Writing Skills:** • Interpreting and describing different types of visual information • Job applications with bio data (solicited and unsolicited) • Statement of Purpose
10	**Text Books: N.A.**
11	**References:** • Bellare, Nirmala. *Reading & Study Strategies*. Books. 1 and 2. Oxford University Press, 1997, 1998 • Bellare, Nirmala. *Easy Steps to Summary Writing and Note-Making.* Amazon Kindle Edition, 2020 • Comfort, Jeremy, et al. *Speaking Effectively: Developing Speaking Skills for Business English*. Cambridge University Press, 1994. • Das, Bikram K., et. al. *An Introduction to Professional English and Soft Skills.* Cambridge University Press India Pvt. Ltd., 2010 • Das, Yadjnaseni & R. Saha (eds.) *English for Careers*. Pearson Education India, 2012. • Dimond-Bayir, Stephanie. *Unlock Level 2 Listening and Speaking Skills* Student's Book and Online Workbook: Listening and Speaking Skills Student's Book+ Online Workbook. Cambridge University Press, 2014. • Doff, Adrian and Christopher Jones. *Language in Use* (Intermediate and Upper Intermediate). CUP, 2004. • Glendinning, Eric H. and Beverley Holmstrom. Second edition. *Study Reading: A Course in Reading Skills for Academic Purposes*. CUP, 2004 • Goodale, Malcolm. P*rofessional Presentations Video Pack: A Video Based Course*. Cambridge University Press, 1998. • Grellet, F. *Developing Reading Skills.* Cambridge: Cambridge University Press, 1981 • Grussendorf, Marion. *English for Presentations.* Oxford University Press, 2007.

- Hamp- Lyons, Liz and Ben Heasiey. Second edition. *Study Writing: A Course in Writing Skills for Academic Purposes*. CUP, 2006
- Labade, Sachin, Katre Deepa et al. *Communication Skills in English*. Orient Blackswan, Pvt Ltd, 2021.
- Lewis, N. *How to Read Better & Faster*. New Delhi, Goyal Publishers & Distributors Pvt. Ltd, 2006.
- McCarthy, Michael and Felicity O'Dell. English *Vocabulary in Use*. Cambridge: Cambridge University Press, 2001.
- Mohan, RC Sharma Krishna. *Business Correspondence and Report Writing*. Third edition. Tata McGraw-Hill Education, 2002.
- Murphy, Raymond, et al. *Grammar in use: Intermediate*. Cambridge University Press, 2000
- Raman, Meenakshi, and Singh, Prakash. *Business Communication*. India, Oxford University Press, 2006.
- Richards, Jack C., and Chuck Sandy. *Passages* Level 2 Student's Book. Cambridge University Press, 2014.
- Sadanand, Kamlesh & S. Punitha. *Spoken English: A Foundation Course*. (Part 1 & 2). Orient Blackswan. 2009.
- Sasikumar, V., et al. *A Course in Listening & Speaking I*. 2005. Cambridge University Press India Pvt. Ltd. (under the Foundation Books Imprint), 2010
- Savage, Alice, et al *Effective Academic Writing*. Oxford: OUP, 2005
- Sethi, J. *Standard English and Indian usage: Vocabulary and grammar*. PHI Learning Pvt. Ltd., 2011.
- Taylor, Grant. *English Conversation Practice*. 1967. Tata McGraw-Hill, 2013
- Turton, Nigel D. *A B C of Common Grammatical Errors*. 1995. Macmillan India Ltd., 1996
- Vas, Gratian. *English Grammar for Everyone*. Mumbai, Shree Book Centre, 2015
- Watson, T. *Reading Comprehension Skills and Strategies*: Level 6. Saddleback Educational Publishing, 2002

Web link Resources:

- A conversation about household appliances: https://youtu.be/rAPl0fSborU 13. Video on psychology: Why do we dream? https://youtu.be/2W85Dwxx218
- Video on social media: What is a social media influencer? https://youtu.be/39A3og7enz8
- Tips on communication (TED Talk): The Secrets of Learning a New Language https://youtu.be/o_XVt5rdpFY
- Expressing opinions: If Cinderella Were a Guy: https://youtu.be/p4OyCNctKXg
- Video on the English language: Where did English come from? https://youtu.be/YEaSxhcns7Y

12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	**Continuous Evaluation through:** • Participation in an activity based on Presentation Skills and Conversation skills each (Module 2 A) (10 marks) The class may be divided into batches by creating formal schedule for the same before the semester End Examination. • Participation in two classroom activities involving skills other than presentation and conversation skills (05 marks) • Overall attendance (05 marks) (Percentage of learners' attendance in class to be considered) **Suggested Activities:** ▪ Listening to audio clips/ books to enhance listening skills ▪ Reading aloud from newspapers, magazines, stories, non-fiction followed by classroom discussion on these to enhance reading and speaking skills	
14	**Format of Question Paper:** for the final examination Q.1. Short notes (2 out of 4) – On Module 1 (A) 10 marks Q.2. A. Unseen Passage (200-250 words) (Module 1 B) 06 marks B. Questions on grammar (Module 1 C) 04 marks Q. 3. Writing Skills (1 out of 2) on Module 2 (B) 10 marks	

Sign of BOS Chairman **Prof. Dr. Shivaji Sargar** **Board of Studies in English**	**Sign of the Offg. Associate Dean** **Dr. Suchitra Naik** **Faculty of Humanities**	**Sign of the Offg. Associate Dean** **Dr. Manisha Karne** **Faculty of Humanities**	**Sign of the Dean** **Prof. Dr. Anil Singh** **Faculty of Humanities**

Letter Grades and Grade Points:

Semester GPA/ Programme CGPA Semester/ Programme	% of Marks	Alpha-Sign/ Letter Grade Result	Grading Point
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

Appendix B

Justification for B.Sc. (Computer Science)

1.	Necessity for starting the course:	The B.Sc. (Computer Science) course is strategically designed to meet the rising demand for skilled professionals while emphasizing innovation. In today's tech-driven era, it addresses the need for individuals proficient in computer science principles, programming, and creative problem-solving. This program not only fills the industry demand for qualified graduates but also instills an innovative mindset, preparing students to drive advancements and address real-world challenges.
2.	Whether the UGC has recommended the course:	Yes
3.	Whether all the courses have commenced from the academic year 2023-24	All courses under the B.Sc. (Computer Science) program have commenced as of the academic year 2023-24. Furthermore, the course has been restructured in alignment with the National Education Policy (NEP) 2020, effective from the academic year 2024-2025.
4.	The courses started by the University are self-financed, whether adequate number of eligible permanent faculties are available?	The courses initiated by the University are self-financed, adhering to the sanction provided by the University of Mumbai to affiliated colleges. The availability of an adequate number of eligible permanent faculties aligns with the self-financed nature of these courses.
5.	To give details regarding the duration of the Course and is it possible to compress the course?	The course duration is three years, spanning six semesters. It is not feasible to compress the course, as the curriculum is structured to ensure comprehensive coverage of the required subjects and allow for effective learning and skill development.
6.	The intake capacity of each course and no. of admissions given in the current academic year:	The intake capacity of the course is 60 students per division. The intake capacity varies across affiliated colleges depending upon the sanction received from the University from time to time.

7.	Opportunities of Employability / Employment available after undertaking these courses:	Upon completion of the B.Sc. (Computer Science) course, students will be well-equipped to pursue various opportunities in the dynamic IT industry, with a strong emphasis on innovation. Graduates will possess the skills required for roles in cutting-edge areas such as software development, data analysis, artificial intelligence, cybersecurity, and more. The curriculum is meticulously designed to align with industry needs and foster a spirit of innovation, making graduates not only highly sought after but also well-prepared to contribute to advancements in technology. The course is structured to instill not only theoretical knowledge but also practical skills and a mindset of innovation, ensuring that graduates are highly employable in diverse and evolving roles such as software development, data analysis, and system administration.

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

AC – 27/12/2023
Item No. – 6.8 (N)

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 20th 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	
1	**Title of program** **O: _____A**	**A**	**U.G. Certificate in Computer Science**
	O: _____B	**B**	**U.G. Diploma in Computer Science**
	O: _____C	**C**	**B.Sc. (Computer Science)**
	O: _____D	**D**	**B.Sc. (Hons.) in Computer Science**
	O: _____E	**E**	**B.Sc. (Hons. with Research) in Computer Science**
2	**Eligibility** **O: _____A**	**A**	A candidate for being eligible for admission must have passed **Higher Secondary School Certificate Examination** (Std. XII) in **Science stream** conducted by the Maharashtra State Board of Secondary and Higher Secondary Education with **Mathematics and Statistics as one of the subject** or its equivalent. Admission will be on merit, based on order of preference as follows: 1. Aggregate Marks at H.S.C. or equivalent. 2. Aggregate Marks in Science Group (Physics, Chemistry and Mathematics) 3. Marks in Mathematics and Statistics and Physics. Marks in Mathematics and Statistics. **OR** Passed Equivalent **Academic Level 4.0** with **Mathematics and Statistics as one of the subject**
	O: _____B	**B**	Under Graduate Certificate in Computer Science **OR** Passed Equivalent **Academic Level 4.5**
	O: _____C	**C**	Under Graduate Diploma in Computer Science **OR** Passed Equivalent **Academic Level 5.0**
	O: _____D	**D**	Bachelors of Science in Computer Science with minimum CGPA of 7.5 **OR** Passed Equivalent **Academic Level 5.5**

	O: _____E	**E**	Bachelors of Science in Computer Science with minimum CGPA of 7.5 **OR** Passed Equivalent **Academic Level 5.5**
3	**Duration of program** **R: _____**	**A**	One Year
		B	Two Years
		C	Three Years
		D	Four Years
		E	Four Years
4	**Intake Capacity** **R: _____**	**60 students per division**	
5	**Scheme of Examination** **R: _____**	NEP **40% Internal** **60% External**, Semester End Examination **Individual Passing** in Internal and External Examination	
6	**Standards of Passing** **R: _____**	**40%** in **each component**	
7	**Credit Structure** **Sem. I - R: _____A** **Sem. II - R: _____ B**	Attached herewith	
	Credit Structure **Sem. III - R: _____C** **Sem. IV - R: _____D**		
	Credit Structure **Sem. V - R: _____E** **Sem. VI - R: _____F**		
8	**Semesters**	**A**	Sem I & II
		B	Sem III & IV
		C	Sem V & VI
		D	Sem VII & VIII
		E	Sem VII & VIII
9	**Program Academic Level**	**A**	4.5
		B	5.0
		C	5.5
		D	6.0
		E	6.0
10	**Pattern**	Semester	
11	**Status**	New	
12	**To be implemented from Academic Year Progressively**	From Academic Year: 2024-25	

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

Sign of the BOS Chairman	**Sign of the Offg. Associate Dean**	**Sign of Offg. Dean**
Dr. Jyotshna Dongardive	**Dr. Madhav R. Rajwade**	**Prof. Shivram S. Garje**
Ad-hoc BOS (Computer Science)	Faculty of Science & Technology	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.

Credit Structure of the Program (Sem II)
Under Graduate Certificate in Computer Science

Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr. / Sem.
1	**Mandatory**	**Electives**						
	6	-	MN:2	2+2	VSC:2, SEC:2	AEC:2, VEC:2	CC:2	22
	MJ1: Design & Analysis of Algorithms (TH) – 2 MJ2: Introduction to OOP using C++ (TH) – 2 MJP1: Computer Science Practical 2 (PR) – 2	-	MN: Industry and Service Management - (ISM)	**OE :** Leadership Styles - (LS) Content Writing - (CW)	**VSC:** Web Technologies **SEC**: Advanced Python Programming	**AEC:** Marathi (भाषिक कौशल्यांचे उपयोगज १ (भाषण व निवेदन कौशल्ये)) OR Hindi (हिंदी भाषा – कौशल के आधार) **VEC:** Foundation of Behavioral Skills – Basic Level - (FBS)	**CC:** Introduction to cultural activities OR Introduction to Sports, Physical Literacy, Health & Fitness and Yoga OR National service scheme (NSS)	

Sem – II

Mandatory Courses

Name of the Course: Design and Analysis of Algorithms

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** 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. **Relevance:** 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. **Usefulness:** 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. **Application:** 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. **Interest:** 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. **Connection with Other Courses:** 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.

		Demand in the Industry: 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. **Job Prospects:** 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.
2	**Vertical:**	Major
3	**Type:**	Theory
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To make students understand the basic principles of algorithm design **CO 2.** To give idea to students about the theoretical background of the basic data structures **CO 3.** To familiarize the students with fundamental problem-solving strategies like searching, sorting, selection, and recursion and help them to evaluate efficiencies of various algorithms. **CO 4.** To teach students the important algorithm design paradigms and how they can be used to solve various real world problems	
8	**Course Outcomes (OC):** **OC 1.** Students should be able to understand and evaluate efficiency of the programs that they write based on performance of the algorithms used. **OC 2.** Students should be able to appreciate the use of various data structures as per need **OC 3.** To select, decide and apply appropriate design principle by understanding the requirements of any real life problems.	
9	**Modules:-** **Module 1 (15 hours):**	
	Introduction to algorithms - 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-Ω Notation, Theta-Θ Notation, Asymptotic Analysis, Performance characteristics of algorithms,	

	Estimating running time / number of steps of executions on paper, Idea of Computability **Introduction to Data Structures -** What is data structure, types, Introduction to Array(1-d & 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. **Recursion -** What is recursion, Recursion vs Iteration, recursion applications like Factorial of a number, Fibonacci series & their comparative analysis with respect to iterative version, Tower of Hanoi problem. **Basic Sorting Techniques** - Bubble, Selection and Insertion Sort & their comparative analysis
	Module 2 (15 hours):
	Searching Techniques - 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 & their comparative analysis, String Algorithms - Pattern matching in strings, Brute Force Method & their comparative analysis **Algorithm Design Techniques** - Introduction to various types of classifications/design criteria and design techniques, Greedy Technique - Concept, Advantages & Disadvantages, Applications, Implementation using problems like - file merging problem. Divide-n-Conquer - Concept, Advantages & Disadvantages, Applications, Implementation using problems like - merge sort, Strassen's Matrix Multiplication **Dynamic Programming -** Concept, Advantages & Disadvantages, Applications, Implementation using problems like - Fibonacci series, Factorial of a number, Longest Common subsequence **Backtracking Programming -** Concept, Advantages & Disadvantages, Applications, Implementation using problems like N-Queen Problem
10	**Text Books** 1. Data Structure and Algorithm Using Python, Rance D. Necaise, Wiley India Edition, 2016. 2. Data Structures and Algorithms Made Easy, Narasimha Karumanchi, CareerMonk Publications, 2016. 3. Introduction to Algorithms, Thomas H. Cormen, 3rd Edition, PHI.
11	**Reference Books** 1. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson, 3rd Edition, 2011. 2. Design and Analysis of Algorithms, S. Sridhar, Oxford University Press, 2014.

<table>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>Continuous Evaluation through:
Class Test on Module 1: 10 marks
Class Test on Module 2: 10 marks
Average of 2 Class Tests: 10 marks
Assignment on Module 1: 5 marks
Assignment on Module 2: 5 marks
Total of 2 Assignments: 10 marks
Total: 20 marks</td><td>Evaluation through:
A Semester End Theory Examination of 1 hour duration for 30 marks as per the paper pattern given below.
Total: 30 marks</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper:

Total Marks: 30 Duration: 1 Hour
<table>
<tr><th>Question</th><th>Based On</th><th>Options</th><th>Marks</th></tr>
<tr><td>Q. 1</td><td>Module 1</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q. 2</td><td>Module 2</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q. 3</td><td>Module 1 & 2</td><td>Any 2 out of 4</td><td>10</td></tr>
</table></td></tr>
</table>

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

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** 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. **Relevance:** 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. **Usefulness:** 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. **Application:** 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. **Interest:** 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. **Connection with Other Courses:** 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

		complex programming concepts. **Demand in the Industry:** 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. **Job Prospects:** 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.
2	**Vertical:**	Major
3	**Type:**	Theory
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	30 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To make learner understand the concepts of OOP **CO 2.** To make learner understand the design of OOP through UML **CO 3.** To make learner familiar with the syntax of C++ **CO 4.** To make learner Analyze and implement concepts of OOP **CO 5.** To make learner create programs relating to OOP concepts	
8	**Course Outcomes (OC):** **OC 1.** The learner will be able to understand, remember, demonstrate, explain and describe concept of OOP **OC 2.** The learner will be able to design UML based diagrams **OC 3.** The learner will be able to illustrate the different types of control statements in C++ **OC 4.** The learner will be able to analyze and implement concept of OOP **OC 5.** The learner will be able to write and create programs relating to OOP concepts	
9	**Modules:-** **Module 1 (15 hours):**	
	Introduction to Programming Concepts: 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	

	C++ program without class, compiling and running C++ program. **Data Types, Data Input Output and Operators:** 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. **Decision Making, Loops, Arrays and Strings:** Conditional statements-if,if...else, switch loops- while, do...while, for, types of arrays and string and string manipulations **Unified Modeling Language (UML):** Introduction to UML & class diagrams. **Classes, Abstraction & Encapsulation:** Classes and objects, Dot Operator, data members, member functions, passing data to functions, scope and visibility of variables in function. **Constructors and Destructors:** Default constructor, parameterized constructor, copy constructor, private constructor, destructors. **Working with objects:** Accessor - mutator methods, static data and static function, access specifiers, array of objects.
	Module 2 (15 hours):
	Polymorphism - Binding-static binding & overloading, constructor overloading function overloading, operator overloading, overloading unary and binary operators. **Modelling Relationships in Class Diagrams:** Association, Aggregation-Composition and examples covering these principles **Inheritance:** 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. **Modelling Relationships:** Generalization-Specialization and examples covering these principles **Run time Polymorphism -** Dynamic Binding, Function overriding, virtual function, pure virtual function, virtual base class, abstract class. **Pointers:** Introduction to pointers, * and & operators, assigning addresses to pointer variables, accessing values using pointers, pointers to objects & this pointer, pointers to derived classes **File Handling:** File Stream classes, opening and closing file-file opening modes, text file handling, binary file handling. **Applying OOP to solve real life applications:** To cover case studies like library management, order management etc. to design classes covering all relationships
10	**Text Books** 1. Object Oriented Programming with C++, Balagurusamy E., 8th Edition, McGraw Hill Education India. 2. UML & C++: A Practical Guide to Object Oriented Development, Lee/Tepfenhart, Pearson Education, 2nd Edition2015

<table>
<tr><td>11</td><td colspan="2">Reference Books
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</td></tr>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>Continuous Evaluation through:
Class Test on Module 1: 10 marks
Class Test on Module 2: 10 marks
Average of 2 Class Tests: 10 marks
Assignment on Module 1: 5 marks
Assignment on Module 2: 5 marks
Total of 2 Assignments: 10 marks
Total: 20 marks</td><td>Evaluation through:
A Semester End Theory Examination of 1 hour duration for 30 marks as per the paper pattern given below.
Total: 30 marks</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper:

Total Marks: 30 Duration: 1 Hour
<table>
<tr><th>Question</th><th>Based On</th><th>Options</th><th>Marks</th></tr>
<tr><td>Q. 1</td><td>Module 1</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q. 2</td><td>Module 2</td><td>Any 2 out of 4</td><td>10</td></tr>
<tr><td>Q. 3</td><td>Module 1 & 2</td><td>Any 2 out of 4</td><td>10</td></tr>
</table></td></tr>
</table>

Name of the Course: Computer Science Practical 2

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** 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. **Relevance:** 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++. **Usefulness:** 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. **Application:** 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++. **Interest:** 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. **Connection with Other Courses:** 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.

		Demand in the Industry: 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. **Job Prospects:** 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.
2	**Vertical:**	Major
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** Analyze and implement algorithms for common computational problems. **CO 2.** Implement algorithms using divide and conquer strategies. **CO 3.** Apply dynamic programming techniques to solve optimization problems. **CO 4.** Implement and analyze algorithms based on greedy strategies. **CO 5.** Comprehend the principles of object-oriented programming. **CO 6.** Design and implement classes and objects in C++. **CO 7.** Implement single, multiple, and hierarchical inheritance. **CO 8.** Implement operator overloading for user-defined types. **CO 9.** Understand the impact of access specifiers on class members.	
8	**Course Outcomes (OC):** **OC 1.** Design and implement algorithms for various problem domains. **OC 2.** Evaluate and compare the time and space complexities of algorithms. **OC 3.** Apply divide and conquer strategies to solve computational problems. **OC 4.** Utilize dynamic programming techniques for optimization problems. **OC 5.** Implement and analyze algorithms based on greedy strategies. **OC 6.** Design and implement classes and objects in C++. **OC 7.** Apply inheritance and polymorphism concepts in program development. **OC 8.** Implement operator overloading for enhanced class functionality. **OC 9.** Utilize advanced features like friend functions, inline functions, and this pointer. **OC 10.** Understand the impact of scope specifiers on class members.	

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:**

	Develop a program that employs one and two-dimensional arrays within a class. Illustrate how classes can handle array-based data structures. **Scope Resolution Operator:** Use the scope resolution operator to declare variables at different scope levels. Display and compare the values of variables with different scopes. **Constructors and Destructors:** Implement programs showcasing various types of constructors and destructors. Explore default, parameterized, copy constructors, and destructor functionalities. **Access Specifiers:** Demonstrate the use of public, protected, and private scope specifiers within a class. Understand the impact of different access specifiers on class members. **Inheritance:** 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. **Advanced Concepts:** Implement programs showcasing friend functions, inline functions, and the use of the this pointer within classes. **Function Overloading and Overriding:** Develop programs to demonstrate function overloading and overriding within classes. **Pointers and File Handling:** Explore the use of pointers within classes, emphasizing dynamic memory allocation. Develop programs for both text and binary file handling within a class context.
10	**Text Books** 1. Data Structure and Algorithm Using Python, Rance D. Necaise, Wiley India Edition, 2016. 2. Object Oriented Programming with C++, Balagurusamy E., 8th Edition, McGraw Hill Education India.

<table>
<tr><td>11</td><td colspan="2">Reference Books
1. Data Structures and Algorithms Made Easy, Narasimha Karumanchi, CareerMonk Publications, 2016.
2. Let Us C++ by KanetkarYashwant, Publisher: BPB Publications, 2020</td></tr>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>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.

Total: 20 marks</td><td>A Semester End Practical Examination of 2 hours duration for 30 marks as per the paper pattern given below.

Certified Journal is compulsory for appearing at the time of Practical Exam

Total: 30 Marks</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper:

Total Marks: 30 Duration: 2 Hours
<table>
<tr><th>Question</th><th>Practical Question Based On</th><th>Marks</th></tr>
<tr><td>Q. 1</td><td>Module 1</td><td>12</td></tr>
<tr><td>Q. 2</td><td>Module 2</td><td>12</td></tr>
<tr><td>Q. 3</td><td>Viva</td><td>06</td></tr>
</table></td></tr>
</table>

Vocational & Skill Enhancement Courses (VSEC)

Name of the Course: Web Designing

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** The Web Designing 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. **Relevance:** 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. **Usefulness:** 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. **Application:** 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. **Interest:** 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. **Connection with Other Courses:** 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.

		Demand in the Industry: 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. **Job Prospects:** 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.
2	**Vertical:**	VSC
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** To understand the concept of Web Technologies **CO 2.** To understand the concepts of Hyper Text Markup Language and Cascading Style Sheets. **CO 3.** To learn JavaScript for creating dynamic websites. **CO 4.** To learn various operations performed on data among web applications using XML **CO 5.** To learn Server-Side Programming using PHP	
8	**Course Outcomes (OC):** **OC 1.** Design valid, well-formed, scalable, and meaningful pages using emerging technologies. **OC 2.** Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites **OC 3.** Develop and implement client-side and server-side scripting language programs. **OC 4.** Develop and implement Database Driven Websites. **OC 5.** Design and apply XML to create a markup language for data and document centric applications.	
9	**Modules:-** **Module 1 (30 hours):**	
	HTML: 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 **CSS:** 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. **JavaScript:** 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	
	Module 2 (30 hours):	
	XML: 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 **AJAX:** AJAX Web Application Model, How AJAX Works, XMLHttpRequest Object – Properties and Methods, Handling asynchronous requests using AJAX e.g. Mouseover, button click, **PHP:** 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	
10	**Text Books** 1. HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed, Dreamtech Press, 2016 2. Web Programming and Interactive Technologies, scriptDemics, StarEdu Solutions India, 2018 3. PHP: A Beginners Guide, Vikram Vaswani, TMH	
11	**Reference Books** 1. HTML, XHTML, and CSS Bible Fifth Edition, Steven M. Schafer, WILEY, 2011 2. Learning PHP, MySQL, JavaScript, CSS & HTML5, Robin Nixon, O'Reilly, 2018 3. PHP, MySQL, JavaScript & HTML5 All-in-one for Dummies, Steve Suehring, Janet Valade Wiley, 2018	
12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	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.	A **Semester End Practical Examination** of **2 hours duration** for **30 marks** as per the paper pattern given below. **Certified Journal** is **compulsory** for appearing at the time of Practical Exam

	Total: 20 marks	**Total: 30 Marks**
14	**Format of Question Paper:** **Total Marks: 30** **Duration: 2 Hours**	

Question	**Practical Question Based On**	**Marks**
Q. 1	Module 1	12
Q. 2	Module 2	12
Q. 3	Viva	06

Name of the Course: Advanced Python Programming

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** 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. **Relevance:** 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. **Usefulness:** 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. **Application:** 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. **Interest:** 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. **Connection with Other Courses:** The knowledge gained in the Advanced Python

		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. **Demand in the Industry:** 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. **Job Prospects:** 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.
2	**Vertical:**	SEC
3	**Type:**	Practical
4	**Credits:**	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted:**	60 Hours
6	**Marks Allotted:**	50 Marks
7	**Course Objectives(CO):** **CO 1.** Master OOPs principles, solving real-world problems. **CO 2.** Create robust Python classes, transfer members efficiently. **CO 3.** Understand and implement inheritance, utilize advanced polymorphism.. **CO 4.** Implement abstract classes, leverage interfaces for flexible code. **CO 5.** Create and synchronize threads, mitigate deadlock issues.	
8	**Course Outcomes (OC):** **OC 1.** Demonstrate comprehensive OOPs proficiency, apply principles effectively. **OC 2.** Develop efficient, reusable classes, successfully transfer members. **OC 3.** Ability to implement inheritance and apply advanced polymorphism. **OC 4.** Ability to implement abstract classes, demonstrate flexibility through interfaces. **OC 5.** Ability to thread creation, synchronization, and effective deadlock resolution.	

9	**Modules:-** **Module 1 (30 hours):**
	OOPs In Python: Introduction to OOPs, Problems in Procedure Oriented Approach, Features of Object Oriented Programming System (OOPS), Constructors and Destructors, **Classes and Objects-** Creating a Class, Self-Variable, Types of Variables, Types of Methods, Passing Members of One Class to Another Class **Inheritance and Polymorphism:** Types of Inheritance, Constructors in Inheritance, Overriding Super Class Constructors and Methods, super() method, Polymorphism, Duck Typing , Operator Overloading, Method Overloading, Method Overriding **Abstract Classes and Interfaces:** Abstract Class, Abstract Method, Interfaces in Python **Threads in Python:** Creating Threads in Python, Single Tasking and Multitasking, Thread Synchronisation, Deadlock in Threads
	Module 2 (30 hours):
	Working with Databases: DBMS, working with MySQL Database-retrieving, inserting, deleting, updating rows from table, Creating Database Tables through Python **Exceptions:** Errors in a Python Program, Exceptions and Exceptions handling, User Defined Exceptions, Logging Exceptions, **Networking:** TCP/IP Protocol Architecture, , User Datagram Protocol (UDP), FTP Architecture, Web Page Operations, Sending a Simple Mail **Graphical User Interface:** Creating a GUI in Python, Widget classes, Layout Manager, Event Handling **Data Science Tools:** Introduction to NumPy, Matplotlib, pandas, Scipy,
10	**Text Books** 1. Practical Programming: An Introduction to Computer Science Using Python 3, Paul Gries , Jennifer Campbell, Jason Montojo, Pragmatic Bookshelf, 2nd Edition, 2014 2. Programming through Python, M. T Savaliya, R. K. Maurya& G M Magar, Sybgen Learning India, 2020
11	**Reference Books** 1. Python: The Complete Reference, Martin C. Brown, McGraw Hill, 2018 2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2017 3. Programming in Python 3, Mark Summerfield, Pearson Education, 2nd Ed, 2018

<table>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>Semester End Examination: 60%</td></tr>
<tr><td>13</td><td>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.
Total: 20 marks</td><td>A Semester End Practical Examination of 2 hours duration for 30 marks as per the paper pattern given below.

Certified Journal is compulsory for appearing at the time of Practical Exam
Total: 30 Marks</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper:

Total Marks: 30 Duration: 2 Hours

<table>
<tr><th>Question</th><th>Practical Question Based On</th><th>Marks</th></tr>
<tr><td>Q. 1</td><td>Module 1</td><td>12</td></tr>
<tr><td>Q. 2</td><td>Module 2</td><td>12</td></tr>
<tr><td>Q. 3</td><td>Viva</td><td>06</td></tr>
</table>
</td></tr>
</table>

MINOR
COURSE
SYLLABUS

AC – 20/04/2024
Item No. – 7.8 Sem. II (5a)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of Minor	
Ad- hoc Board of Studies in B. Com. (Management Studies)	
UG First Year Programme	
Semester	**II**
Title of Paper	**Credits 2/ 4**
Industry and Service Management I (Basics of I & S)	2
From the Academic Year	**2024-25**

Sr. No.	Heading	Particulars
1	**Description the course:** **Including but not limited to:**	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	**Vertical :**	Major/Minor/Open Elective /Skill Enhancement / Ability Enhancement/Indian Knowledge System (Choose By √)
3	**Type :**	Theory / Practical
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives:** 1. Differentiate between different types of industries and their defining characteristics 2. Apply industry analysis frameworks to assess competitive landscapes 3. Evaluate the impact of various factors on industry performance and service delivery 4. Design and analyze service models for optimal customer experience.	

8	**Course Outcomes**: 1. Learners should Differentiate between various industry types and their characteristics 2. Identify the key factors influencing industry performance and competition 3. Understand the core principles of service management and customer experience 4. Analyse the challenges and opportunities unique to service businesses

9	**Modules**: -
	Module 1: Basics of Industry Management
	a) Concept of Industry Management, Characteristics of IM, Types, Prose and Corns of Industry Management b) Industry Analysis: Framework of Porter's Five Forces, Industry Life Cycle, Technological advancement, Government regulations
	Module 2: Basics of Service Management
	a) Concept of service and service Management, characteristics of services, importance of service industry b) Scope and Classification of services - Specialized services, Customer services and Industrial services, Reasons for growth of service industry in India.
10	**Text Books:** • *Service Sector in India - recent policy initiative a New century publication 2008* • *A. Vijaykumar Service Sector management - An Indian perspective - Bhattacharjee, Jaico publishing House 2011.*

	Reference Books: • Industry Analysis by Michael E. Porter • Operations Management by Roberta F. Shang and Kenneth S. Meizer • Competitive Strategy by Michael E. Porter • Good Strategy Bad Strategy by Richard Rumelt • *Service marketing - Temani V. K. Prism Publication* • *Management of Service Sector - Bhatia B. S. VP Publication*

12	**Internal Continuous Assessment: 40%**	**External, Semester End Examination Individual Passing in Internal and External Examination : 60%**
13	**Continuous Evaluation through:** Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)	
14	**Format of Question Paper:** for the final examination **External Paper Pattern (30 Marks)** Q1. Case Study Analysis 10 Marks Q2. Answer the following (Any One) 10 marks A Or B Q3. Answer the following (Any One) 10 Marks A Or B	

Sign of the BOS Chairman **Prof. Dr. Kanchan Fulmali** **BOS in BMS**	**Sign of the Offg. Associate Dean** **Dr. Ravikant Balkrishna Sangurde** **Faculty of Commerce**	**Sign of the Offg. Associate Dean** **Prin. Kishori Bhagat** **Faculty of Management**	**Sign of the Offg. Dean** **Prof. Kavita Laghate** **Faculty of Commerce & Management**

OPEN ELECTIVE SYLLABUS

AC – 20/04/2024
Item No. – 7.7 Sem. II (5a)

As Per NEP 2020

University of Mumbai

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

Sr. No.	Heading	Particulars
1	**Description the course:** **Including but not limited to:**	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	**Vertical :**	Major/Minor/Open Elective /Skill Enhancement / Ability Enhancement/Indian Knowledge System (Choose By √)
3	**Type :**	Theory / Practical
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: 1. To acquaint the learners with basic fundamentals of leadership. 2. To orient & apply the theoretical & practical perspective of leadership in the changing dynamics of the society.	

8	**Course Outcomes**: 1. Generate social sensitization among youth of the nation. 2. Students will explore various leadership theories and their applications in real-world scenarios 3. Learner should develop effective communication skills for leading and motivating teams 4. Analyze the dynamics of teamwork and foster a collaborative work environment

9	**Modules**: -
	Module 1: Leaders & Leadership
	a) Definition of Leader & leadership, Traits/qualities of a successful leader, Skill sets required for an effective leader – Role of communication in leadership. b) Leadership Styles – Women as Leaders - Time Management & Leadership – Tools & techniques for effective time management.
	Module 2: Theories & Trends in Leadership
	a) Theories of Leadership – Great Man Theory of Leadership – Trait Theory of Leadership- Transactional & Transformational Leadership Theory. b) Leadership Training – Concept – Need for leadership - Youth Leadership - Principles of youth leadership – Social leadership – Need, Success stories of successful business & social leaders.
10	**Text Books:** ● *Ramaswamy. V S & Namakumari. S, MARKETING MANAGEMENT-PLANNING IMPLEMENTATION AND CONTROL, Macmillan Business Books, New Delihi, 2002, Hall Of India, New Delhi,*

11	**Reference Books:** ● Khanna, S.S. Human resource Management (Text and Cases). S. Chand, New Delhi. ● Chhabra, T.N.,Human Resource Management, Dhanpat Rai & Co., Delhi. ● Aswathappa K.,Human Resource Management ata McGraw, Hill, New Delhi. ● Robbins, Stephen P. Organisational Behaviour. Pearsons Education, New Delhi ● Leadership and Self-Deception: Getting Out of the Box by The Arbinge ● Dare to Lead by Brené Brown ● Multipliers: How the Best Leaders Multiply Intelligence, Influence, and Capability of Others by Liz Wiseman ● The Management Challenge by Manfred Kets de Vries ● High-Output Management by Andrew Grove	
12	**Internal Continuous Assessment: 40%**	**External, Semester End Examination Individual Passing in Internal and External Examination : 60%**
13	**Continuous Evaluation through:** Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)	
14	**Format of Question Paper:** for the final examination **External Paper Pattern (30 Marks)** Q1. Case Study Analysis 10 Marks Q2. Answer the following (Any One) 10 marks A Or B Q3. Answer the following (Any One) 10 Marks A Or B	

Sign of the BOS Chairman **Prof. Dr. Kanchan Fulmali** **BOS in BMS**	**Sign of the Offg. Associate Dean** **Dr. Ravikant Balkrishna Sangurde** **Faculty of Commerce**	**Sign of the Offg. Associate Dean** **Prin. Kishori Bhagat** **Faculty of Management**	**Sign of the Offg. Dean** **Prof. Kavita Laghate** **Faculty of Commerce & Management**

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

As Per NEP 2020

University of Mumbai

Syllabus for Basket of OE	
Board of Studies in ENGLISH	
UG First Year Programme	
Semester II	
Title of Paper	**Credits 2/4**
Content Writing	**2**
From the Academic Year	**2024-2025**

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	**Content Writing** In the digital age, content writing has emerged as a skill sought after by businesses and other institutions. With the growing impact of online media and social media, there is a need for writers who understand the media, and who possess the language skills required to generate quality content. Through this course, students can explore the potentially lucrative career option of content writing. It will introduce them to the basics of the craft and make them aware of the techniques employed in content writing. This course will also tap into and channelize the students' creative potential while enhancing their employability.
2	**Vertical :**	Open Elective
3	**Type :**	Theory
4	**Credit**:	2 credits (1 credit = 15 Hours for Theory in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives:** 1. To introduce learners to the fundamentals of Content Writing 2. To make the learners aware of the various media, including social media, for which content is written 3. To expose the learners to the various techniques of writing and editing content 4. To promote creative thinking and expression by the learners 5. To equip learners for Content Writing as a potential career option	

8	**Course Outcomes**: At the end of the course, learners will: ● Develop an understanding of the basic concepts in Content Writing ● Exhibit the ability to understand and differentiate among the various media for which content is written ● Develop the ability to write content and edit it suitably ● Exercise creative writing skills. ● To develop analytical, researching, and better comprehension skills.
9	**Modules**:-
	Module 1: Introduction to Content Writing (15 lectures)
	● Need/Demand for and Scope of Content Writing ● Role of the Content Writer ● Content Writing in the age of the internet ● Principles of Content Writing ● Process of Content Writing ● Types of Content Writing - emails, blogs, headlines, social media posts ● Ethics of Content Writing - Avoiding plagiarism in Content Writing, Use of Artificial Intelligence (AI)
	Module 2: Process of Content Writing (15 lectures)
	● Understanding the brief, research, and preparation, brainstorming ● Writing emails, blogs, headlines, social media posts ● Types of social media – Facebook, Instagram, x (formerly Twitter) etc. ● Effective use of hashtags, captions, and titles ● New types of content – Topical posts, reels, memes and GIFs ● Editing and Proofreading ● Importance of the readership/ audience
10	**Text Books:** **Not Applicable**

11	**References:** Web link Resources: https://www.mindler.com/blog/how-to-become-a-content-writer-in-india/ https://www.clearvoice.com/blog/10-types-content-writers-use/ https://study.com/articles/What_is_a_Content_Writer.html https://www.entrepreneur.com/article/247908 https://www.locationrebel.com/b2b-writing/ https://wordpress.com/support/prevent-content-theft/ https://blog.unisquareconcepts.com/content-writing/what-is-plagiarism-why-is-it- important-for-blog-writing/ Feldar, Lynda. Writing for the Web: Creating Compelling Web Content Using Words, Pictures, and Sound. New Riders, CA, USA. ISBN-13: 978-0321794437, ISBN- 10: 9780321794437. James, Anthony. Blog Writing: The Content Creation Blueprint. Amazon digital services LLD-KDP print US, 2018. Jones, Colleen. Clout: The Art and Science of Influential Web Content. New Riders, CA, USA. ISBN-13: 978-0321733016, ISBN-10: 0321733010. Nielsen, Jakob and Budiu, Raluca. Mobile Usability. New Riders, CA, USA. ISBN- 13: 978-0321884480, ISBN-10: 0321884485. Redish, Janice. Letting Go Of The Words: Writing Web Content That Works. Morgan Kaufmann. ISBN: 0123859301. Robinson Joseph. Content Writing Step-by-step. Amazon Digital Services LLC--KDP print US, 2020. ISBN: 9798603871929. Williams, Andy. How to Write Great Website Content in 2019. Independently published. ISBN: 1731384467.	
12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	**Continuous Evaluation through:** ● Writing/editing / analyzing content as per the principles studied (10 marks) ● Participation in classroom activities including presentations, discussions, and writing tasks (formal schedules may be prepared for the same before the semester-end examination.) (05 marks) ● Overall attendance (05 marks) (Percentage of learners' attendance in class to be considered) **Suggested Activities:** ▪ Writing content for various media ▪ Editing content ▪ Analyzing content from popular blogs and social media channels Creating memes, GIFs, reels, or topical posts	

14	**Format of Question Paper:** for the final examination • Q.1. Short notes (2 out of 4) – On Module 1 10 marks • Q.2. A. Writing and editing tasks (2 out of 4) - On Module 2 10 marks o Email o Blog post o Headlines o Editing unseen content provided Q. 3. Answer in 2-3 lines (5 out of 7) On both Modules 10 marks

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

ABILITY ENHANCEMENT COURSE SYLLABUS

AC – 20.04.2024
Item No. – 5.6 (N) Sem II 1(c)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of AEC	
Board of Studies in Marathi	
UG First Year Programme	
Semester	**II**
Title of Paper	**Credits**
भाषिक कौशल्यांचे उपयोजन – १ (भाषण व निवेदन कौशल्ये)	**2**
From the Academic Year	**2024-25**

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	**भाषिक कौशल्यांचे उपयोजन – १** **(भाषण व निवेदन कौशल्ये)** राष्ट्रीय शैक्षणिक धोरण- २०२० नुसार पदवीच्या प्रथम वर्षातील एका सत्रात क्षमता विकसन अभ्यासक्रम (Ability Enhancement Course) या शीर्षकांतर्गत आधुनिक भारतीय भाषेचे अध्ययन अनिवार्य करण्यात आले आहे. आधुनिक भारतीय भाषेचा प्रस्तुत अभ्यासक्रम व अध्ययन प्रामुख्याने भाषा क्षमता विकसन केंद्री असावे, असेही या धोरणात नमूद करण्यात आले आहे. त्यामुळे या अभ्यासपत्रिकेच्या अध्ययनातून विद्यार्थ्यांना भाषिक कौशल्यांचा तपशीलवार परिचय करून देणे तसेच ती कौशल्ये आत्मसात करण्याची संधी उपलब्ध करून देणे अभिप्रेत आहे. या पार्श्वभूमीवर भाषण व निवेदन कौशल्ये या दोन भाषिक कौशल्यांचा परिचय करून देणारी ही अभ्यासपत्रिका आहे. या अभ्यासपत्रिकेच्या अध्ययनातून भाषण व निवेदनाचे स्वरूप, विविध कार्यक्रम व घटना-प्रसंगीची भाषणे व निवेदन, विविध स्वरूपांच्या भाषण व निवेदनाची पूर्वतयारी, त्यासाठी आवश्यक क्षमता व तंत्रांचा व भाषिक-आंगिक-वाचिक कौशल्यांचा परिचय व्हावा, असे अपेक्षित आहे. या अभ्यासपत्रिकेचे अध्ययन करणाऱ्या विद्यार्थ्यांमध्ये भाषण व निवेदनाची जाण व क्षमता विकसित होईल, हे लक्षात घेऊन प्रस्तुत अभ्यासपत्रिकेची आखणी करण्यात आली आहे.
2	**Vertical :**	Ability Enhancement Course
3	**Type :**	Theory + Practical
4	**Credit**:	02 (1 credit = 15 Hours for Theory in a Semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives** : १. विविध कार्यक्रम व घटना-प्रसंगीच्या भाषणाचे स्वरूप समजावून सांगणे. २. विविध घटना प्रसंगीच्या निवेदनाचे स्वरूप समजावून सांगणे. ३. प्रभावी भाषण करण्यासाठी आवश्यक असणाऱ्या क्षमता आणि तंत्रांचा परिचय करून देणे. ४. प्रभावी निवेदन करण्यासाठी आवश्यक असणाऱ्या क्षमता आणि तंत्रांचा परिचय करून देणे. ५. प्रत्यक्ष भाषण आणि निवेदन करण्याची संधी उपलब्ध करून देणे.	
8	**Course Outcomes** : १. विद्यार्थ्यांना विविध कार्यक्रम व घटना-प्रसंगी करावयाच्या भाषणाचे स्वरूप कळेल. २. विद्यार्थ्यांना विविध कार्यक्रम व घटना-प्रसंगी करावयाच्या निवेदनाचे स्वरूप कळेल. ३. विविध कार्यक्रम व घटना-प्रसंगी करावयाच्या भाषणासाठी आवश्यक असणाऱ्या क्षमता आणि तंत्रांचा विद्यार्थ्यांना परिचय होईल. ४. विविध कार्यक्रम व घटना-प्रसंगी करावयाच्या निवेदनासाठी आवश्यक असणाऱ्या क्षमता आणि तंत्रांचा विद्यार्थ्यांना परिचय होईल. ५. विद्यार्थ्यांना प्रत्यक्ष भाषण आणि निवेदन करण्याची संधी उपलब्ध होईल व त्यांच्या क्षमता विकसित होतील.	

9	**Modules (अभ्यास घटक) :**	
	Module 1 (घटक- ०१) : भाषण कौशल्य	
	१. भाषण : संकल्पना, भाषण : स्वरूप वैविध्य, भाषण प्रकार. २. भाषण कौशल्याचे उपयोजन : भाषणाची पूर्वतयारी, भाषण संहिता (लिखित व मौखिक), भाषिक-आंगिक-वाचिक कौशल्ये (६० मिनिटांच्या १५ तासिका, श्रेयांकन - १)	
	Module 2 (घटक- ०२) : निवेदन कौशल्य	
	१. निवेदन : संकल्पना, निवेदनाचे स्वरूप वैविध्य, निवेदनाचे प्रकार. २. निवेदन कौशल्याचे उपयोजन : निवेदनाची पूर्वतयारी, निवेदन संहिता (लिखित व मौखिक), काल-परिस्थिती भान, भाषिक-वाचिक कौशल्ये. (६० मिनिटांच्या १५ तासिका, श्रेयांकन -१)	
10	**Text Books :** N.A.	
11	**Reference Books:** १. केळकर अशोक, वैखरी : भाषा आणि भाषाव्यवहार, स्नेहवर्धन प्रकाशन, पुणे, २०००. २. तौर पृथ्वीराज (संपा०), मराठी भाषिक कौशल्य विकास, अथर्व पब्लिकेशन्स, धुळे, २०१८. ३. नसिराबादकर ल० रा० व्यावहारिक मराठी, भाषा संशोधन केंद्र, कोल्हापूर, २०२३. ४. केळकर अशोक, मध्यमा : भाषा आणि भाषाव्यवहार, *मराठी भाषा आणि वाचिक अभिनय*, मेहता पब्लिशिंग हाऊस, पुणे, १९९६. ५. भाषिक सर्जन आणि उपयोजन, राजन गवस, अरूण शिंदे, गोमटेश्वर पाटील, दर्या प्रकाशन, पुणे, २०१२	
12	**Internal Continuous Assessment: 40%**	**External, Semester End Examination 60% Individual Passing in Internal and External Examination**
13	**Continuous Evaluation through:** अंतर्गत मूल्यमापन : २० गुण चाचणी परीक्षा / मौखिक परीक्षा / प्रकल्पलेखन, नियत कार्य (Assignment) / सादरीकरण/ प्रश्नमंजूषा उपरोक्त कोणत्याही पद्धतीचा अवलंब करून अंतर्गत मूल्यमापन करता येईल. (प्रत्यक्ष उपस्थिती किंवा ऑनलाईन पद्धती)	
14	**Format of Question Paper: (बहिर्गत परीक्षेच्या प्रश्नपत्रिकेचे स्वरूप)** बहिर्गत परीक्षा ३० गुण (वेळ एक तास) ● एकूण तीन प्रश्न विचारावेत. ● प्रत्येक घटकावर अंतर्गत पर्याय असलेले प्रत्येकी १० गुणांचे दोन प्रश्न विचारावेत. ● तिसरा प्रश्न हा घटक १ आणि २ वर आधारित दहा गुणांचा वस्तुनिष्ठ स्वरूपाचा असावा.	

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

AC – 20.04.2024
Item No. – 5.6 (N) Sem II (5a)

As Per NEP 2020

University of Mumbai

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

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	**हिन्दी भाषा : कौशल के आधार** 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।
2	**Vertical :**	Open Elective
3	**Type :**	Theory
4	**Credit**:	2 credits (1 credit = 15 Hours for Theory in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: (List some of the course objectives) 1. विद्यार्थियों को लेखन, वाचन कौशल का ज्ञान देना एवं रोजगार के अवसरों से जोड़ना। 2. विद्यार्थियों को लेखन, वाचन कौशल से परिचय करते हुए अभिव्यक्ति की शैलियों का विकास करना। 3. विद्यार्थियों को भाषण कला के विविध रूपों को समझाना, मौलिकता में अभिवृद्धि लाना एवं विशेषज्ञता दिलाना। 4. विद्यार्थियों को श्रवण कौशल की विशेषताओं से परिचय कराते हुए श्रवण कौशल के लाभों से अवगत कराना।	

8 **Course Outcomes**: (List some of the course outcomes)

CO-1) विद्यार्थियों को लेखन, वाचन कौशल के ज्ञान प्राप्ति के साथ मौलिक अभिव्यक्ति में बदलाव आएगा।

CO-2) विद्यार्थियों का लेखन, वाचन कौशल द्वारा मानसिक विकास होगा, पठन-शक्ति, शैली का विकास होगा।

CO-3) विद्यार्थियों को लेखन, भाषण कौशल से भाषिक-शक्ति, शैलियों का संवर्धन होगा विशेषज्ञता आएगी।

CO-4) विद्यार्थियों को लेखन, वाचन, श्रवण, भाषण कौशल की विशेषताओं और उपयोगिता का ज्ञान प्राप्त होगा।

9 **Modules**:-

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

10 **संदर्भ ग्रंथ सूची** -

1. हिंदी भाषा शिक्षण के विविध आयाम - प्राध्यापक डॉ. राठौर, किनले एडिशन
2. अभिनव पत्र लेखन - डॉ अनिल सिंह
3. हिंदी के व्यावहारिक रूप - डॉ संतोष मोटवानी, परिदृश्य प्रकाशन, मुंबई
4. हिंदी भाषा लेखन कौशल - गुलीबाबा पब्लिकेशन प्राइवेट लिमिटेड

11	**Internal Continuous Assessment: 40%**	**External, Semester End Examination 60% Individual Passing in Internal and External Examination**
12	**Continuous Evaluation through:** **मूल्यांकन प्रारूप** ***आंतरिक मूल्यांकन- 20- अंक*** 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	**Format of Question Paper:** ***बाह्य मूल्यांकन- लिखित परीक्षा- 30- अंक*** ***परीक्षा अवधि- 01 घंटा*** ***निम्नलिखित तीन में से किन्हीं दो प्रश्नों के उत्तर लिखिए*** ***30 अंक*** कुलयोग- **30 अंक**	

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

VALUE EDUCATION
COURSE
SYLLABUS

AC – 24/11/2023
Item No. – 8.2 (N) -5

As Per NEP 2020

University of Mumbai

Title of the Course

Foundation of Behavioural skills – Basic level

Semester – Sem I

Syllabus for Two Credit

(With effect from the academic year 2024-25)

PROGRAM	BA /BSc/ BCOm
SEMESTER	I
COURSE TITLE	Foundation of Behavioural skills Basic level
VERTICLE /CATEGORY	E (Value Education Course)
COURSE LEVEL	50
COURSE CODE	
COURSE CREDIT	2
HOURS PER WEEK THEORY	2
HOURS PER WEEK PRACTICAL/TUTORIAL	

COURSE OBJECTIVE

1. To develop understating about behavioural Skills.

2. To develop communication skills of students through experiential learning.

3. Life skill development through work life balance and stress management training.

4. To developing effective leadership quality among the learners.

COURSE OUTCOME

CO1: Learners will be able to Define and Identify different life skills required in personal and professional life

CO2: Learners will develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.

CO3: Learners will be able to explain the basic mechanics of effective communication and demonstrate these through presentations and take part in group discussions

CO4: Learners will be able to use appropriate thinking and problem-solving techniques to solve new problems

ORGANISATION OF THE COURSE		
UNIT NO	COURSE UNITS	HOURS PER WEEK
1	Module 1: Behavioural skills	2*5=10
2	Module 2: Stress Management	2*2=04
3	Module 3: 21st-century skills	2*5=10
4	Module 4: Understanding Value Education	2*3=6
	TOTAL HOURS	30

COURSE DESIGN

UNIT TITLE	OUTCOME	DESCRIPTION	PEDAGOGICAL APPROACH
Behavioural skills	Learners will be able to Define and Identify different life skills required in personal and professional life.	Overview of Life Skills: Meaning and significance of life skills, skills identified by WHO: Self-awareness, Empathy, Critical thinking, Creative thinking, Decision making, problem solving, Effective communication, interpersonal relationship, coping with stress, coping with emotion. Life skills for professionals: positive thinking, right attitude, attention to detail, having the big picture, learning skills, research skills, perseverance, setting goals and achieving them, helping others, leadership, motivation, self-motivation, and motivating others, personality development, IQ, EQ, and SQ2.	Examples, TED Talks, videos.

Stress Management	Learners will develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.	Stress, reasons and effects, identifying stress, stress diaries, the four A's of stress management, techniques, Approaches: action-oriented, emotion-oriented, acceptance-oriented, resilience, Gratitude Training, Coping with emotions: Identifying and managing emotions, harmful ways of dealing with emotions, PATH method and relaxation techniques.	Examples, Role Plays, Behavioral Simulations and Games
21st-century skills	Learners will be able to explain the basic mechanics of effective communication and demonstrate these through presentations and take part in group discussions	Creativity, Critical Thinking, Collaboration, Problem Solving, Decision Making, Need for Creativity in the 21st century, Imagination, Intuition, Experience, Sources of Creativity, Lateral Thinking, Myths of creativity, Critical thinking Vs Creative thinking,	Case Discussions, Games and simulations, Group discussions.
Understanding Value Education	Learners will be able to use appropriate thinking and problem-solving techniques to solve new problems	Introduction – Definition, Importance, Process & Classifications of Value Education: Understanding the need, basic guidelines, content and process for Value Education Understanding the thought-provoking issues; need for Values in our daily life Choices making – Choosing, Cherishing & Acting, Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.	Case Discussions, Games and simulations, Community Service, Presentations

CONTINUOUS ASSESSMENT TESTS (CAT) & SEMESTER END EXAMINATION (SEE)			
NATURE OF ASSESSMENT	**MARKS**	**METHODOLOGY**	**COURSE OUTCOME**
CAT 1 *	10	Online Quiz, Open book test, Presentations, Projects and Viva	CO1
CAT 2 *	05	Presentations, Projects and Viva	CO1, CO2
CAT 3 *	10	Online Quiz, Open book test, Presentations, Project Assignment and Viva	CO3
CAT 4 *	05	Presentations, Projects and Viva	CO4
SEE	30	Five questions of 10 marks each (from each course unit), to be attempted any 3, 10 marks may be subdivided into two sub questions of 5 marks	CO1, CO2,CO3, CO4

*Any Two for 20 marks

ESSENTIAL READINGS	**1.** R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics. 2. Shiv Khera, "You Can Win" , Macmillan Books, New York, 2003. 3. Barun K. Mitra, "Personality Development & Soft Skills", Oxford Publishers, Third impression,2017.
ADDITIONAL READINGS	The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change Stephen Covey Free Press (first published August 15th 1989)

Syllabus Drafting Committee

Prof. Dr. Aruna Deshpande
Prof. Dr. Tejashree Deshmukh
Mr. Nitin Vazirani

Mr. Bhooshan Mailkani
Dr. Vinita Pimple

Signature
Prof. Kavita Laghate

Chairman of Board of Studies in Value Education

CO-CURRICULAR COURSE SYLLABUS

AC – 24/11/2023
Item No. – 8.4 (N) - 3

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 I
NSS CC
Sub: - Introduction to National Service Scheme

Credits: 02 **Marks:50**

Unit Number	SEMESTER 1 Title of the Unit	No. of Lecture
1	**Introduction to National Services Scheme** NSS- History,Philosophy & Need of Emergence Aims, Objectives, Motto and Emblem of NSS, NSS Theme Song Organizational Structure of NSS-Hierarchy at different levels (National,State,University,College) Roles and Responsibilities of Program Officer Financial Provisions -Grant in Aid for NSS Advisory committees & their functions	15
2	NSS Programmes and Activities (Regular activities) NSS Programmes and Activities (Special Camp activities) Yearly Action Plan of NSS Unit Volunteerism– Meaning, definition, basic qualities of volunteers, need of volunteerism for National development. Opportunities in NSS for Volunteers (Various Camps) Report Writing	15

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	**Leadership & Personality development:** Meaning, definition, qualities, and characteristics of a Leader. Meaning of personality, Dimensions of personality. Personality and Leadership nexus. Universal Human Values and Ethics for youths Sustainable Development Goals	15	
2	**Activity Based Programmes** (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. **Shramadhan – P**lantation, Cleaning, Watering, Weeding, Any other activities. **Awareness Programmes –** Seminar, Workshops, Celebration of National and International days, Personality Development Programmes, Group Activities, etc., Rally,Visit to Adopted villages, SwatchathaProgramme, 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 awarenessProgramme, Literacy Programme, Water Conservation Programme,One Day Special Camp in a village (preferably in adopted village/Adopted areas/Slums/MR Schools etc).	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**
Total	**20**

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/
11. Barnard, I. C. (1938). Functions of the Executive. Boston: Harvard Press.
12. Barrett, R. (2013). The Values-driven Organisation: Unleashing Human Potential for Performance andProfit. London: Fulfilling Books
13. Barret Values Center (2018). Values-based leadership. Available at: https://www.valuescentre.com/mapping-values/leadership/values-based- leadership
14. Bauman, D. C. (2013). Leadership and the three faces of integrity. The Leadership Quarterly, 24(3), 414-426.
15. Bishop, W. H. (2013). Defining the Authenticity in Authentic Leadership. The Journal of Values-BasedLeadership, 6(1), Article 7. Available at : https://scholar.valpo.edu/cgi/viewcontent.cgi?article=1077&context=jvbl
16. Bourne, P. A. (2016). Leadership as a service: a new model for higher education in a new century – a bookreview. Review of Public Administration and Management, 4, 196. Available at:https://www.omicsonline.org/open- access/leadership-as-a-service-a-new-model-for-higher-education-in-a- newcentury--a-book-review-2315-7844-1000196.php?aid=83165
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,
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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/2024-25/234 Date: 14th 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 11th 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 06th 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).

MUMBAI – 400 032
14th 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), Vidyanagari,
8) The Deputy Registrar, Admissions, Enrolment, Eligibility & Migration Department (AEM).

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

Copy for information :-	
1	P.A to Hon'ble Vice-Chancellor, vice-chancellor@mu.ac.in
2	P.A to Pro-Vice-Chancellor pvc@fort.mu.ac.in
3	P.A to Registrar, registrar@fort.mu.ac.in
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), camu@accounts.mu.ac.in

To,

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

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	Faculty of Inter-Disciplinary Studies, **Dean** 1.Dr. Anil K. Singh aksingh@trcl.org.in **Associate Dean** 2.Prin.Chadrashekhar Ashok Chakradeo cachakradeo@gmail.com
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, dboee@exam.mu.ac.in
5	The Director, Board of Students Development, dsd@mu.ac.in@gmail.com DSW direcotr@dsw.mu.ac.in
6	The Director, Department of Information & Communication Technology, director.dict@mu.ac.in

BOS - 06/02/2025
12 (7) of M.P.U.A. 2016
Item No. - 1

As Per NEP 2020

University of Mumbai

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

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.

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1.4 Programme Duration: The structure of the Credit Couse 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	**Importance of Physical Education and Sports**	15
	II	**Participation in any physical activities**	15
2	III	**Volunteering in any sports events or fitness events**	15
	IV	**Participation in University or any other Sports competitions**	15
Total No. of Hours			**60**

Module No.	Unit	Content
1	**I**	**1.1 Importance of Physical Education and Sports & Yoga** • Development of physical health as well as mental health through Physical Activities. • Group Sports & Fitness Activities • Fitness activities conducted by any sports/fitness instructor such as Yoga, Zumba, Aerobics etc.
	II	**1.2 Participation in any Physical activities** • Participation in any sports practice sessions conducted by our college/ any club / any institution • Completion of any Yoga/ Pilates/ Gym course/ any fitness related course • Participation in any other physical activities of the interest of student
2	**III**	**2.1 Volunteering in any sports events or fitness events** • Volunteering done in sports or fitness events organized by the college • Volunteering in any other fitness or sports activities organized by NGO or local clubs
	IV	**2.2 Participation in University or any other Sports competitions** • Participation in University Intercollegiate/ Inter Zonal / West Zone/ All India / National / State tournaments organized by University of Mumbai or State or District Sports Federation • Participation in any other intra college competition organized by college • Participation in any recognized Sports or Fitness competitions

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 **OR** Project **OR** Assignment **(Students must include the Geo Tagged photos, Enrolment receipt, Certificate etc. in the report)**	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 **OR** 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
Total		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.
5. Singh Hardayal (1991), Science of Sports Training, DVS Publication, New Delhi
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

University of Mumbai

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Email id - dr.aams@fort.mu.ac.in
aams3@mu.ac.in

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/ 219 Date: 31st 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 11th 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 23rd November, 2024 and subsequently passed by the Board of Deans at its meeting held on 30th December, 2024 **vide** item No. 8.1 (N) have been accepted by the Academic Council at its meeting held on 27th 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).

MUMBAI – 400 032
31st 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).

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

Copy for information :-	
1	P.A to Hon'ble Vice-Chancellor, vice-chancellor@mu.ac.in
2	P.A to Pro-Vice-Chancellor pvc@fort.mu.ac.in
3	P.A to Registrar, registrar@fort.mu.ac.in
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), camu@accounts.mu.ac.in

To,

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

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

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
Total No. of Hours			**30**

Module No.	Unit	Content
1	**I**	**1.1 Foundation of Performing Arts** • Introduction to Performing Arts • Historical Evolution and Cultural Significance of Performing Arts • Basic Elements of Performing Arts
	II	**1.2 Essential Skill Sets in Performing Arts** • Character Development and Analysis

		• Emotional Exploration and Expression • Fundamentals of Voice Modulation and Projection • Improvisation Skills • Scene Study and Script Interpretation • Career Options in Performing Arts
2	**III**	**2.1 Chronicles of Indian Artistry** • Indus Valley Civilization • Folk and Tribal Art Forms • Impact of Aesthic Art on Sacred Architecture • Revival and Preservation of Ancient Indian Art
	IV	**2.2 Contemporary and Modern Art** • Modern Trends in Indian Art • Eminent Contemporary Artists of India • Career Options in Fine Arts

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 **OR** Project **OR** Assignment	15
2	Participation in Workshop / Conference / Seminar (as decided by the Teacher) **OR** Participation in Online Workshop / Conference / Seminar (as decided by the Teacher) **OR** Field Visit **OR** Attendance	5

Semester End Examination (30 Marks)

Question No.	Particulars	Marks
1	**Objective Type Questions (All Units)**	06
2	**Descriptive Question(s) on Unit I** The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
3	**Descriptive Question(s) on Unit II** The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
4	**Descriptive Question(s) on Unit III** The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
5	**Descriptive Question(s) on Unit IV** The Question may be divided into sub questions: Attempt any 2 out of 4 (Each of 3 Marks)	06
Total		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.*
- *Strasberg, L. (1987). A dream of passion: The development of the method. Plume.*
- *Dehejia, V. (1997). Indian art. Phaidon Press.*
- *Nath, A. (2013). Preservation of art and architecture in ancient India. Bharatiya Kala Prakashan.*
- *Chawla, K. (2010). Opportunities in fine arts careers. Vikas Publishing House.*
- *Preece, R. (2011). Careers in art and design. Kogan Page.*

- *Dalmia, Y. (2001).* The making of modern Indian art: The progressives. *Oxford University Press.*

EXAM PATTERN
B.Sc.(C.S.)

QUESTION PAPER PATTERN

(External and Internal)

<table>
<tr><td rowspan="4">I</td><td colspan="2">A Theory of 2 credits is evaluated for a total of 50 Marks</td></tr>
<tr><td>Internal Continuous Assessment:</td><td>40%[20 Marks]</td></tr>
<tr><td colspan="2">Continuous Evaluation through:
Class test of 1 of 15 marks
Class test of 2 of 15 marks
Average of the two: 15 marks

Quizzes/ Presentations/ Assignments: 5 marks
Total: 20 marks</td></tr>
<tr><td colspan="2">External Semester End Examination: 60%[30 Marks]</td></tr>
<tr><td colspan="3">Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour)
Q1: Attempt any two (out of four) from Module 1 (15 marks)
Q2: Attempt any two (out of four) from Module 2 (15 marks)</td></tr>
<tr><td rowspan="4">II</td><td colspan="2">A Practical of 2 credits is evaluated for a total of 50 Marks</td></tr>
<tr><td>Internal Continuous Assessment:</td><td>40%[20 Mrks]</td></tr>
<tr><td colspan="2">Continuous Evaluation through:
Students are expected to attend each practical and submit the written practical of the previous session. Performing Practical and writeup submission will be continuous internal evaluation. 2.5 marks can be awarded for each practical performance and writeup submission totalling to 50 marks and can be converted to 20 marks.</td></tr>
<tr><td colspan="2">Semester End Examination: 60%[30 Marks]</td></tr>
<tr><td colspan="3">Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination(30 Marks)
Practical Slip:
Q1. From Module 1 13 marks
Q2. From Module 2 12marks
Q3. Journal and Viva 05 marks</td></tr>
</table>

Examination and Standard of Passing:

Regulations regarding the scheme of exams, number of credits and standard of passing will be as prescribed by the University of Mumbai.

A student is said to have passed if he/she secures 40% of marks allotted in each head of passing. External evaluation of 30 marks and Internal evaluation of 20 marks are treated as separate heads of passing.

The Ten Point Grading System prescribed by the University of Mumbai will be as follows:

Letter Grades and Grade Points

Semester GPA/ Program CGPA Semester/ Program	**% of Marks**	**Alpha-Sign / Letter GradeResult**	**Grade Points**
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	F (Fail)	0
Ab (Absent)	-	Absent	0

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

Letter Grades and Grade Points:

Semester GPA/ Programme CGPA Semester/ Programme	% of Marks	Alpha-Sign/ Letter Grade Result	Grading Point
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

Appendix B

Justification for B.Sc. (Computer Science)

1.	Necessity for starting the course:	The B.Sc. (Computer Science) course is strategically designed to meet the rising demand for skilled professionals while emphasizing innovation. In today's tech-driven era, it addresses the need for individuals proficient in computer science principles, programming, and creative problem-solving. This program not only fills the industry demand for qualified graduates but also instills an innovative mindset, preparing students to drive advancements and address real-world challenges.
2.	Whether the UGC has recommended the course:	Yes
3.	Whether all the courses have commenced from the academic year 2023-24	All courses under the B.Sc. (Computer Science) program have commenced as of the academic year 2023-24. Furthermore, the course has been restructured in alignment with the National Education Policy (NEP) 2020, effective from the academic year 2024-2025.
4.	The courses started by the University are self-financed, whether adequate number of eligible permanent faculties are available?	The courses initiated by the University are self-financed, adhering to the sanction provided by the University of Mumbai to affiliated colleges. The availability of an adequate number of eligible permanent faculties aligns with the self-financed nature of these courses.
5.	To give details regarding the duration of the Course and is it possible to compress the course?	The course duration is three years, spanning six semesters. It is not feasible to compress the course, as the curriculum is structured to ensure comprehensive coverage of the required subjects and allow for effective learning and skill development.
6.	The intake capacity of each course and no. of admissions given in the current academic year:	The intake capacity of the course is 60 students per division. The intake capacity varies across affiliated colleges depending upon the sanction received from the University from time to time.

7.	Opportunities of Employability / Employment available after undertaking these courses:	Upon completion of the B.Sc. (Computer Science) course, students will be well-equipped to pursue various opportunities in the dynamic IT industry, with a strong emphasis on innovation. Graduates will possess the skills required for roles in cutting-edge areas such as software development, data analysis, artificial intelligence, cybersecurity, and more. The curriculum is meticulously designed to align with industry needs and foster a spirit of innovation, making graduates not only highly sought after but also well-prepared to contribute to advancements in technology. The course is structured to instill not only theoretical knowledge but also practical skills and a mindset of innovation, ensuring that graduates are highly employable in diverse and evolving roles such as software development, data analysis, and system administration.

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