University of Mumbai

No. AAMS_UGS/ICC/2024-25/ 103

CIRCULAR:-

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

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

(The circular is available on the University's website www.mu.ac.in).

Baliram

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

MUMBAI – 400 032
22nd August, 2024

To

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

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

Copy forwarded with Compliments for information to:-

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

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

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

1	The Chairman, Board of Deans
2	The Dean, Faculty of Humanities,
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, 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,
7	The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari, director@idol.mu.ac.in

AC – 12/7/2024
Item No. – 6.5 (R)

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: SU-521A**	**A**	**U.G. Certificate in Computer Science**
	O: SU-521B	**B**	**U.G. Diploma in Computer Science**
	O: SU-521C	**C**	**B.Sc. (Computer Science)**
	O: SU-521D	**D**	**B.Sc. (Hons.) in Computer Science**
	O: SU-521E	**E**	**B.Sc. (Hons. with Research) in Computer Science**
2	**Eligibility** **O: SU-522A**	**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: SU-522B	**B**	Under Graduate Certificate in Computer Science **Academic Level 4.5**
	O: SU-522C	**C**	Under Graduate Diploma in Computer Science **Academic Level 5.0**
	O: SU-522D	**D**	Bachelors of Science in Computer Science with minimum CGPA of 7.5 **Academic Level 5.5**
	O: SU-522E	**E**	Bachelors of Science in Computer Science with minimum CGPA of 7.5 **Academic Level 5.5**

3	**Duration of program** **R: SU-551**	**A**	One Year
		B	Two Years
		C	Three Years
		D	Four Years
		E	Four Years
4	**Intake Capacity** **R: SU-552**		
5	**Scheme of Examination** **R: SU-553**	NEP **40% Internal** **60% External**, Semester End Examination **Individual Passing** in Internal and External Examination	
6	**Standards of Passing** **R: SU-554**	**40%** in **each component**	
7	**Credit Structure** **Sem. I - R: SU-555A** **Sem. II -R: SU-555B**	Attached herewith	
	Credit Structure **Sem. III - R: SU-555C** **Sem. IV -R: SU-555D**		
	Credit Structure **Sem. V - R: SU-555E** **Sem. VI -R: SU-555F**		
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.

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

Under Graduate Certificate in Computer Science

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

Under Graduate Diploma in Computer Science

<table>
<tr><td></td><td colspan="9">R:_____C</td><td></td></tr>
<tr><td rowspan="2">Level</td><td rowspan="2">Semester</td><td colspan="2">Major</td><td rowspan="2">Minor</td><td rowspan="2">OE</td><td rowspan="2">VSC, SEC (VSEC)</td><td rowspan="2">AEC, VEC, IKS</td><td rowspan="2">OJT, FP, CEP, CC, RP</td><td rowspan="2">Cum. Cr. / Sem.</td><td rowspan="2">Degree/ Cum. Cr.</td></tr>
<tr><td>Mandatory</td><td>Electives</td></tr>
<tr><td rowspan="5">5.0</td><td>III</td><td>MJ5: Principles of Operating Systems (TH) – 2
MJ6: Theory of Computation (TH) – 2
MJ7: Data Structures (TH) – 2
MJP3: Computer Science Practical 3 (PR) – 2
8</td><td>-</td><td>4</td><td>2</td><td>VSC:2
Java Programming – 2</td><td>AEC:2</td><td>FP: 2CC:2</td><td>22</td><td rowspan="5">UG Diploma 88</td></tr>
<tr><td colspan="9">R:_____D</td></tr>
<tr><td>IV</td><td>MJ8: Computer Networks (TH) – 2
MJ9: Software Engineering (TH) – 2
MJ10: IoT Technologies (TH) – 2
MJP4: Computer Science Practical 4 (PR) – 2
8</td><td>-</td><td>4</td><td>2</td><td>SEC:2
Mobile Application Development – 2
OR
MEAN Stack Development – 2</td><td>AEC:2</td><td>CEP: 2
CC:2</td><td>22</td></tr>
<tr><td>Cum Cr.</td><td>28</td><td>-</td><td>10</td><td>12</td><td>6+6</td><td>8+4+2</td><td>8+4</td><td>88</td></tr>
<tr><td colspan="11">Exit option; Award of UG Diploma in Major and Minor with 80-88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor</td></tr>
</table>

B.Sc. (Computer Science)

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

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

Semester I

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

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

Semester II

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

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

Sem – I

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, 6th edition, Penram.	
12	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
13	**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**	**Evaluation through:** A **Semester End Theory Examination** of **1 hour duration** for **30 marks** as per the paper pattern given below. **Total: 30 marks**

14	**Format of Question Paper:** **Total Marks: 30** **Duration: 1 Hour**

Question	**Based On**	**Options**	Marks
Q. 1	Module 1	*Any 2 out of 4*	10
Q. 2	Module 2	*Any 2 out of 4*	10
Q. 3	Module 1 & 2	*Any 2 out of 4*	10

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>
<tr><td>11</td><td colspan="2">Reference Books
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>
<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 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
1. R P Jain, Modern Digital Electronics, Tata McGraw Hill Education Pvt. Ltd. , 4th Edition, 2010
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.

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>

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>
<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>

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	

	Module 2 (30 hours):	
	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	
10	**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	
11	**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	
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 100 marks, should be scaled down to a final score of 20 marks. **Total: 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: 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: 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.

<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 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>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>

Name of the Course: Quantitative Techniques – I (OE – I)

Sr. No.	Heading	Particulars
1	**Description the course:** **Including but not limited to:**	This course deals with the Basic Mathematics that forms an essential component of Most of the Competitive and Entrance Examinations, such as Banking, Management Entrance, UPSC/MPSC, SET/NET, GMAT/GRE to quote a few. Although the Math-concepts involved in these examinations are of elementary level, the nature of the problems in such exams is far different, and the difficulty level of the questions is much higher, than the typical ones, based on which students are tested in schools. A person appearing for such exams is expected to have a thorough understanding of the concepts, to have ability to think logically, and to be able to interpret the data, presented in different manner.
2	**Vertical:**	Open Elective
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):** This course revises the basic mathematical concepts learned during school career. However, the problems asked in this course would be mostly advanced and indirect, and would demand broader and critical thinking. The course aims to enhance the reasoning power and logical thinking of the learners and nurture their intellect so as to make them competent across all competitive exams. CO1. To reinforce the basic math concepts and ideas within the learners CO2. To enhance the reasoning power of the learners and make them think over and apply concepts/formulae to solve math problems of indirect nature, thereby developing their problem-solving capacity. CO3. To develop logical thinking of the learners CO4. To make learners competent across all competitive and entrance examinations.	
8	**Course Outcomes (OC):** After completion of the course, students will be able to. OC1: understand the integers, rational numbers, real numbers and their operations. OC2: learn the concepts of GCD, LCM. OC3: understand the concepts related to averages and percentages, such as arithmetic mean.	

	geometric mean, harmonic mean OC4: evaluate the ratios and proportions OC5: understand the Profit, Loss, Percentage Profit and Percentage Loss. OC6: learn the concepts related to Time, Speed and Distance.
9	**Modules:-** **Module 1: Elementary Arithmetic - I** 1. Numbers and BODMAS: • Review of the number systems (Integers, Whole Numbers, Rational Numbers and Real Numbers) • Review of the basic operations and their results (like odd + even = odd, odd × even = even, odd raised to even is odd etc) • Easy tricks to do fast calculations (multiplication, squares, square-roots etc) • GCD and CLM of two or more numbers. 2. Averages and Percentage: • The three different means viz. Arithmetic Mean, Geometric Mean, Harmonic Mean • Properties of the three means, such as (a) AM-GM-HM inequality, (b) The mean of two numbers lies in between the two numbers, (c) In case of several numbers, the product of AM and the number of numbers equals the addition of numbers, (d) In case of several numbers, the product of the numbers equals the GM raised to the number of numbers, (e) The effect of adding the same quantity to each number on AM, (f) The effect of multiplying each number by the same quantity on GM • Percentage 3. Ratio and Proportion: • Concept of Ratio of two quantities • Ratio related properties such as invertendo, alternendo, componendo, dividendo etc • Direct and Inverse Proportion [The problems to be asked should be of varied levels of difficulty. A few ones based on directly applying a given formula may be asked at the beginning; however, the latter ones should demand critical analysis of the given information and a thoughtful selection of the method/formula to solve the same.]
	Module 2: Elementary Arithmetic – II 1. Profit and Loss: • Definitions of Profit and Loss • The concept of Percentage Profit and Percentage Loss 2. Time, Speed and Distance: • The concept of average speed based on the total distance crossed and the total time taken • The difference between crossing a pole/tower/tree/human and crossing a tunnel/bridge/station • Crossing a stationary object versus crossing a moving object

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- Moving with/against the current (in a river)

3. Work, Pipes and Cisterns:

- Work done in unit time is reciprocal of the total work done (assuming that the amount of work done in each unit time is same),
- Filling/refilling/emptying cisterns.

</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>10</td><td colspan="2">Text Books

1. Bible To Basic Mathematics, Pragati Agarwal
2. Quantitative Aptitude for Competitive Examinations, R. S. Agarwal
3. Logical and Analytical Reasoning: Useful for All Competitive Exams, A. K. Gupta</td></tr>
<tr><td>11</td><td colspan="2">Reference Books

1. Arithmetic : Subjective And Objective For Competitive Examinations, R. S. Agarwal
2. Maths Book For Competitive Exams, Vikas Bhalla
3. Reasoning For Competitive Examinations, Nishit K Sinha</td></tr>
<tr><td></td><td colspan="2"><u>Scheme of the Examination</u></td></tr>
<tr><td></td><td colspan="2">The performance of the learners shall be evaluated into two parts.
• Internal Continuous Assessment of 20 marks for each paper.
• Semester End Examination of 30 marks for each paper.
• Separate head of passing is required for internal and semester end examination.</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: Quizzes, Class Tests, presentations, projects, role play, creative writing, assignments etc.
(at least 3)
<table>
<tr><td>Sr. No.</td><td>Particulars</td><td>Marks</td></tr>
<tr><td>1</td><td>A class test of 10 marks is to be conducted during each semester in an Offline mode.</td><td>10</td></tr>
<tr><td>2</td><td>Project on any one topic related to the syllabus or a quiz (offline/online) on one of the modules.</td><td>05</td></tr>
<tr><td>3</td><td>Seminar/ group presentation on any one topic related to the syllabus.</td><td>05</td></tr>
</table></td><td></td></tr>
</table>

	Paper pattern of the Test (Offline Mode with One hour duration): Q1: Definitions/Fill in the blanks/ True or False with Justification. (04 Marks: 4 x 1). Q2: Attempt any 2 from 3 descriptive questions. (06 marks: 2 × 3)	

14 **Format of Question Paper:**

The semester-end examination will be of 30 marks of one hour duration covering the entiresyllabus of the semester.

Note: Attempt any TWO questions out of THREE.			
Q.No.1	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks
Q.No.2	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks
Q.No.3	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks

Sign of the BOS Chairman
Dr. Bhausaheb S Desale
The Chairman, Board of Studies in Mathematics

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

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

Name of the Course: Logic and Data Interpretation – I (OE – II)

Sr. No.	Heading	Particulars
1	**Description the course:** **Including but Not limited to:**	This course deals with the Logical Thinking and Data Interpretation, that forms an essential component of Most of the Competitive and Entrance Examinations, such as Banking, Management Entrance, UPSC/MPSC, SET/NET, GMAT/GRE to quote a few. The nature of the problems and the difficulty level of the questions is quite high and a person appearing for such exams is expected to have a thorough understanding of the concepts, to have ability to think logically, and to be able to interpret the data, presented in different manner.
2	**Vertical :**	Open Elective
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):** This course revises the basic mathematical concepts learned during school career. However, the problems asked in this course would be mostly advanced and indirect, and would demand broader and critical thinking. The course aims to enhance the reasoning power and logical thinking of the learners and nurture their intellect so as to make them competent across all competitive exams. CO1. To reinforce the basic math concepts and ideas within the learners CO2. To enhance the reasoning power of the learners and make them think over and apply concepts/formulae to solve math problems of indirect nature, thereby developing their problem-solving capacity. CO3. To develop logical thinking of the learners CO4. To make learners competent across all competitive and entrance examinations.	
8	**Course Outcomes (OC):** After completion of the course, the learners will be able to OC1: think logically about the given sequence of numbers/alphabets/symbols OC2: understand the odd/unfit element amongst the set of various elements OC3: develop logical thinking to obtain relations between two people	

	OC4: understand the directions, angles between any two angles OC5: get a general idea about the concept of coding a message and how to decode a coded message OC6: develop logical thinking to check whether or not the given information is sufficient to answer a question.
9	**Modules:-** **Module 1: Fundamentals of Logical thinking - I** 1. Number/Letter/Symbol Series: • Given a finite sequence of numbers, the learners are expected to find a simple rule (difference between or the ratio of consecutive numbers, square-quantities, cube-quantities, recursive rules etc) that binds all the numbers and be able to fill in the gap either at the end or at the beginning or in between. • Given a finite sequence of objects, made up of sets of alphabets/symbols, the learners are expected to observe the pattern that is visible in each set of letters/symbols and be able to predict the missing object/s 2. Odd Man Out: • Given a finite sequence of numbers, the learners are expected to find a simple rule that binds all but one and be able to find out the odd one • Given a finite sequence of objects, made up of sets of alphabets/symbols, the learners are expected to observe the pattern that fits each except one and be able to find out the miss-fit object 3. Relations: • Understanding the terms in relations such as mother, father, son, daughter, grand-mother, grand-father, grandson, grand-daughter, brother, sister, siblings, mother-in-law, father-in-law, cousin, nephew, niece, husband, wife, life- partner, spouse, uncle, aunt. • Forming a tree/diagram based on the information given, vertical aligning of different generations, definite symbols to be used for different people viz. square for male, circle for female, triangle for those whose gender is not specified and cannot be determined, double arrow (↔) for siblings and equality (=) for married couples [The problems to be asked should be of varied levels of difficulty. A few ones based on directly applying a given formula may be asked at the beginning; however, the latter ones should demand critical analysis of the given information and a thoughtful selection of the method/formula to solve the same.]
	Module 2: Fundamentals of Logical Thinking - II 1. Directions: • The eight directions and their names • The angles between any two directions • Revision of simple Pythagorean triplets such as (3-4-5), (6-8-10), (5-12-13), (7-24-25), (8-15-17), (9-12-15), (10-24-26), and their use in finding the distance between two points, say A and B when AC and CB are perpendicular, Revision of 45-45-90 triangle.

<table>
<tr><td></td><td>2. Coding and Decoding
Alphabet Coding, Numerical Coding, Symbol based Coding, Values Coding, Substitution Coding
Deciphering a given Coding
3. Data Sufficiency:
The concept/idea of Data Sufficiency, for example, the lengths of all the sides are sufficient to find the area of a triangle but not of a quadrilateral
Problems based on insufficient data and finding the minimal info needed to obtain the answer (In such case, not the final answer, but the minimal additional required information is to be found out) – The problems may be based on elementary mathematics or day-to-day situations.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>10</td><td>Text Books

1 A Modern Approach To Verbal & Non-Verbal Reasoning, R. S. Agarwal

2. Quantitative Aptitude for Competitive Examinations, R. S. Agarwal
3. Logical and Analytical Reasoning: Useful for All Competitive Exams, A. K. Gupta</td></tr>
<tr><td>11</td><td>Reference Books

1. How To Crack Test of Reasoning In All Competitive Exams, Jaikishan and Premkishan
2. Maths Book For Competitive Exams, Vikas Bhalla
3. Reasoning For Competitive Examinations, Nishit K Sinha</td></tr>
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Internal Continuous Assessment of 20 marks for each paper.
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</table>

	mode.	
2	Project on any one topic related to the syllabus or a quiz (offline/online) on one of the modules.	05
3	Seminar/ group presentation on any one topic related to the syllabus.	05

Paper pattern of the Test (Offline Mode with One hour duration):
Q1: Definitions/Fill in the blanks/
True or False with Justification.
(04 Marks: 4 x 1).
Q2: Attempt any 2 from 3
descriptive questions. (06 marks: 2
× 3)

14 **Format of Question Paper:**
The semester-end examination will be of 30 marks of one hour duration covering the entiresyllabus of the semester.

Note: Attempt any TWO questions out of THREE.			
Q.No.1	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks
Q.No.2	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks
Q.No.3	Module 1 and 2	Attempt any **THREE** out of **FOUR**. (Each question of 5 marks) (a) Question based on OC1/OC2 (b) Question based on OC3 (c) Question based on OC4 (d) Question based on OC5/OC6	15 Marks

Name of the Course: Fundamentals of People's Skills

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	This course deals with the fundamentals of people's skills which are one of the most important aspects of Life Skills required to be developed among students. Acquiring these skills would help them to develop ethical foundation right during their young days. It would foster creativity and innovation among these student while sensitizing them towards respecting social and cultural differences.
2	**Vertical :**	Skill Enhancement
3	**Type :**	Theory / Practical
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks

Course Objectives	1. To develop ethical foundation among students. 2. To encourage creativity and innovation among young minds. 3. To create awareness among students about the importance of being a good listener. 4. To sensitize students about recognizing and dealing with different social, cultural backgrounds more effectively 5. To enable students to conduct themselves more professionally and put across their views in front of others more effectively.
Course Outcomes	**Students will be able to:** 1. Demonstrate ethical behavior coupled with integrity. 2. Will generate new ideas and create a business plan. 3. Will be able to develop good listening skills which are vital for demonstrating good team qualities. 4. Will build sensitivity about social and cultural differences and illustrate good etiquettes. 5. Will be able to present themselves and their thoughts in front of others more confidence.
Module 1: Ethics and Integrity (6 Hours)	Importance of ethics. (Story-telling) Ethical decision-making. (Discussing biographies) Personal and professional moral codes of conduct. (Discussing biographies) Creating a harmonious life. (Interactive session)
Module 2: Entrepreneurial Skills (6 Hours)	1. Who is an entrepreneur (Story-telling) 2. Traits and qualities of a good entrepreneur (Story-telling) 3. Types of entrepreneurs (Interactive session with Story-telling) 4. Problem identification and idea generation (role play/ simulation)

	5. Idea validation (Interactive session with Story-telling) 6. Pitch-deck presentation (video)
Module 3 Teamwork and Importance of Listening in a Team (6 Hours)	1. What is a team? (Conceptual Clarity) 2. Advantages of being a good listener in a team (Story telling) 3. Listening as a team leader (Case study) 4. Listening as a team member(Interactive session) 5. Improving listening skills (Interactive session)
Module 4 Resume Writing and CV Building (6 Hours)	1. Difference between a Resume and CV (Conceptual Clarity) 2. Essentials of writing a good Resume (Practical Application) 3. How to build a good CV (Practical Application) **4.** Common Mistakes in preparing a good resume/ building a good CV (Conceptual Clarity)
Module 5 Professional, Social and Cultural Etiquettes (6 Hours)	1. Why following etiquettes is important (Interactive session) 2. Types of etiquettes (Conceptual Clarity) 3. Professional etiquettes (Video + Story-telling) 4. Social etiquettes (Video + Story-telling) 5. Cultural etiquettes (Video + Story-telling) 6. Role of etiquettes in creating a better personal and professional image (Video + Story-telling)
Suggested Readings and e-resources	1. Bentley University. (2022, December 7) 7 ways to promote diversity in the workplace.https://www.bentley.edu/news/7-ways-promote-diversity-workplace. 2. Roy, B. D. (2022, August 1). Active listening; its skills and importance in the workplace. Nurture an Engaged and Satisfied Workforce | Vantage Circle HR Blog. https://blog.vantagecircle.com/active-listening/. 3. Hisrich, R. D., Peters, M. P., and Shepherd D. A. (2017). Entrepreneurship. 10 4. th Ed.McGraw Hill Education 5. Ashokan, M. S. (2015). Karmayogi: A Biography of E. Sreedharan. London: Penguin. 6. Nellickappilly, S. (n.d). Ethics. [Video]. NPTEL. https://nptel.ac.in/ 7. courses/109/106/109106117/.
Assessment and Evaluation	Continuous assessment throughout the semester of 30 Marks by maintain a logbook and/ or a journal and final project of 20 marks at the end of the semester
Signature of the Team	

Signature:
Prof. Kavita Laghate
Chairman of Board of Studies in Value Education

AC – 28.06.2024
Item No. – 8.1 (N)

As Per NEP 2020

University of Mumbai

Syllabus for Indian Knowledge System	
Board of Studies in Indian Knowledge System	
UG First Year Programme	
Semester	**I OR II**
Title of Paper	**Credits 2 for either I or II Semester**
I) Indian Knowledge System	
From the Academic Year	**2024-2025**

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc.
2	**Vertical :**	Major/Minor/Open Elective /Skill Enhancement / Ability Enhancement/Indian Knowledge System (Choose By √)
3	**Type :**	Theory / Practical
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**: (List some of the course objectives) 1. To sensitize the students about context in which they are embedded i.e. Indian culture and civilisation including its Knowledge System and Tradition. 2. To help student to understand the knowledge, art and creative practices, skills and values in ancient Indian system. 3. To help to study the enriched scientific Indian heritage. 4. To introduce the contribution from Ancient Indian system & tradition to modern science & Technology.	
8	**Course Outcomes**: (List some of the course outcomes) 1. Learner will understand and appreciate the rich Indian Knowledge Tradition 2. Lerner will understand the contribution of Indians in various fields 3. Lerner will experience increase subject-awareness and self-esteem 4. Lerner will develop a comprehensive understanding of how all knowledge is ultimately intertwined	
9	**Modules**:-	
	Module 1: (10 Hours)	
	1. Introduction to IKS (What is knowledge System, Characteristic Features of Indian Knowledge System) **2.** Why IKS? (Macaulay's Education Policy and its impact, Need of revisiting Ancient Indian Traditions) **3.** Scope of IKS (The Universality of IKS (from Micro to Macro), development form Earliest times to 18th Century CE) **4.** Tradition of IKS (Ancient Indian Education System: Home, Gurukul, Pathashala, Universities and ancient educational centres) **5**. Relevant sites in the vicinity of the Institute (Water Management System at Kanheri, Temple Management of Ambarnath, etc.)	

	Module 2: (10 Hours)	
	1. Medicine (Ayurveda) **2.** Alchemy **3**. Mathematics **4.** Logic **5.** Art of Governance (Arthashastra)	
	Module 3: **(10 Hours) (Select Any FIVE out of the following)**	
	1. Aesthetics **2.** Town Planning **3**. Strategic Studies **4.** Krishi Shastra **5.** Vyakaran & Lexicography **6**. Natyashastra **7**. Ancient Sports **8**. Astronomy	**9**. Yoga and Wellbeing **10.** Linguistics **11.** Chitrasutra **12.** Architecture **13.** Taxation **14.** Banking **15.** Trade and Commerce
10	**Reference Books** **1.** Concise history of science in India- D.M. Bose, S.N Sen, B.V. Subbarayappa. **2.** Positive sciences of the Ancient Hindus- Brajendranatha seal, Motilal Banrasidas, Delhi 1958. **3.** History of Chemistry in Ancient India & Medieval India, P.Ray- Indian Chemicals Society, Calcutta 1956 **4.** Charaka Samhita- a scientific synopsis, P. Ray & H.N Gupta National Institute of Sciences of India, New Delhi 1965. **5.** MacDonnell A.A- History of Sanskrit literature **6.** Winternitz M- History of Indian Literature Vol. I, II & III **7.** Dasgupta S.N & De S.K- History of Sanskrit literature Vol. I. **8.** Ramkrishna Mission- cultural heritage of India Vol. I, II & III. **9.** Majumdar R. C & Pushalkar A.D- History & culture of the Indian people, Vol. I, II & III. **10.** Keith A.B- History of Sanskrit literature. **11.** Varadachari V- History of Sanskrit literature Chaitanya Krishna- A new History of Sanskrit	
11	**Continuous Internal Assessment: 20 Marks**	**Semester End Examination : 30 Marks**
12	**Continuous Evaluation through:** Assignment/ Presentations/ Projects (Group/Individual) / Field Visit Report **10 Marks,** class Test / MCQ Test **5 Marks,** Overall Conduct and Class Participation **5 Marks**	
13	**Format of Question Paper:** for the final examination Q1. Attempt any TWO Questions out of FIVE. **6 Marks** Q2. Attempt any THREE Questions out of SIX 1**2 Marks** Q3. Attempt any THREE Questions out of SIX. 1**2 Marks**	

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

Sign of the Offg. Associate Dean
Name of the Associate Dean
Faculty of Interdisciplinary Studies
Name of the Faculty

Sign of the Offg. Dean
Name of the Offg. Dean
Faculty of Interdisciplinary Studies
Name of the Faculty

As Per NEP 2020

University of Mumbai

Title of the Program

Introduction to Cultural Activities

SEM I

Syllabus for Two Credit

(With effect from the academic year 2024-25)

Aims and Objectives

- To study the importance of cultural activities in India.
- To discuss the historical importance of cultural activities.
- To define and describe the overview of cultural practices at Indian and Global level.
- To list the various forms of cultural activities and its applied skills.
- To describe the role of organizations for organizing cultural activities in India.

Learning Outcomes

- Understand the significance of cultural activities
- Sensitize students towards Indian culture and its preservation
- Apply the knowledge and skills of the cultural activities in their practical life
- Participate in the various cultural activities

Modules at Glance Semester I

Module No.	Unit	Content	No. of Hours
1	I	Overview to Cultural Activities	05
	II	History of Student Cultural Activities	05
2	III	Forms / Types of Literary and Fine Arts Activities and its Applied Skills	10
	IV	Forms / Types of Performing Arts Activities and its Applied Skills	10
Total No. of Hours			**30**

Module No.	Unit	Content	No. of Hours
1	**I**	**1.1 Overview to Cultural Activities** • Definition of culture and its manifestations • Understanding cultural diversity and inclusivity • The role of cultural activities in preserving heritage • Overview of Indian cultural practices • Overview of global cultural practices	05
	II	**2.1 History of Student Cultural Activities** □ Role of student cultural activities □ History of student cultural activities in India	05

		• Role of AIU in preserving cultural heritage of India • History of student cultural activities in Maharashtra • Student Cultural activities at University of Mumbai	
2	**III**	**3.1 Forms / Types of Literary and Fine Arts Activities and its Applied Skills** **3.1.1 Various Forms of Literary Arts** • **Elocution**: Reading Skills, Soft Skills, Languages, Communication Skills, etc. • **Debate**: Reading Skills, Soft Skills, Languages, Communication Skills, etc. • **Story Writing**: Introduction, Plot, Characterization, Presentation, Relevance, Language Style, etc. • **Story Telling**: Introduction, Plot, Characterization, Presentation, Relevance, Language Style, etc. • **Quiz**: General Knowledge skills **3.1.2 Various Forms of Fine Arts** • **Painting:** Visualization, Delivery of the Subject, Composition, Colour Application, Presentation and Overall Impact • **Collage:** Visualization, Delivery of the Subject, Handling of Medium, Composition, Presentation and Overall Impact • **Poster Making:** Visualization, Delivery of the Subject, Presentation, Tagline and Overall Impact • **Clay Modeling:** Visualization, Delivery of the Subject, Handling of Medium, Composition, Presentation and Overall Impact • **Cartooning:** Visualization, Delivery of the Subject, Characters, Synchronization, Colour Application, Composition, Presentation and Overall Impact • **Rangoli:** Visualization, Delivery of the Subject, Colour Scheme, Elements, Presentation and Overall Impact • **Mehendi Designing:** Originality, Creativity, Decorative Art with Aesthetic Sense, Presentation and Overall Impact	**10**

		• **Spot Photography:** Impact, Composition, Technical Quality and Suitability for the Specific Theme • **Installation:** Visualization, Delivery of the Subject, Handling of Medium, Synchronization, Composition, Presentation and Overall Impact	
	IV	**4.1 Forms / Types of Performing Arts Activities and its Applied Skills** **4.1.1 Various Forms of Dance** • **Folk Dance:** History and Origin of Folk Dance In India, Types and their Uniqueness, Significance of Folk Dance, Folk Dances in Maharashtra • **Classical Dance:** History of Classical Dance, Types and their Peculiarities, Significance of Classical Dances in India **4.1.2 Various Forms of Theatre** • History of Indian Theatre • Types and their Uniqueness • Significance of Indian Theatre • **Various Forms of Theatre**: One Act Play, Skit, Mime, Mimicry **4.1.3 Various Forms of Music** • History of Indian Music, • Types and their Uniqueness, • Significance of Music in India • **Various Forms of Music**: Classical Singing, Light Vocal, Percussion, Non-Percussion, Natyasangeet, Western Vocal, Western Instrumental	**10**

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
Total		**20**

Semester End Examination (30 Marks)

Question No.	Particulars	Marks
1	**Objective Type Questions (All Units)**	6
2	**Descriptive Question(s) on Unit I** [This question may be divided into sub questions like (a) (b) for 3 Marks + 3 Marks or 4 Marks + 2 Marks pattern]	6
3	**Descriptive Question(s) on Unit II** [This question may be divided into sub questions like (a) (b) for 3 Marks + 3 Marks or 4 Marks + 2 Marks pattern]	6
4	**Descriptive Question(s) on Unit III** [This question may be divided into sub questions like (a) (b) for 3 Marks + 3 Marks or 4 Marks + 2 Marks pattern]	6
5	**Descriptive Question(s) on Unit IV** [This question may be divided into sub questions like (a) (b) for 3 Marks + 3 Marks or 4 Marks + 2 Marks pattern]	6
Total		30

Reference Books

1) Rabindranath Tagore, The Centre of Indian Culture. Rupa and Co, India, 2017.
2) Chopra, J. K. Indian Heritage and Culture. Unique Publisher, India, 2013.
3) Patnaik Devdatta, Indian Culture, Art and Heritage. Pearson, India, 2021.
4) Cassady Marsh, An Introduction to the Art of Theatre: A comprehensive test- Past, Present and Future. Colorado Springs, Colo, 2017.
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AC – 24/11/2023
tem No. – 8.4 (N) - 1

As Per NEP 2020

University of Mumbai

Title of the Program

Co-Curricular Course
Introduction to Sports, Physical Literacy, Health and Fitness and Yog

SEM I

Syllabus for Two Credit

(With effect from the academic year 2024-25)

Semester I
Course Structure

Semester	Paper	Title of Paper	No of lecture (Theory)	Internal Evaluation (IE)	End Semester Evaluation	Total Marks	Credits
First	CC	Introduction to Sports, Physical Literacy, Health & Fitness and Yoga	30	20	30	50	02
Second	CC	Introduction to Sports, Physical Literacy, Health & Fitness and Yoga	30	20	30	50	02
Total	**-**	**-**	**60**	**40**	**60**	**100**	**04**

Semester I

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 make students familiarize with concepts of Health, Fitness, Yoga, Sports & Physical Literacy.
2. To sensitize the students about background knowledge of Sports structure of Sports Federations, Indian Olympic Association, Khelo India Schemes, FIT India movement, National Sports Day, Intercollegiate Sports structure of University of Mumbai.

3. To familiarize the students with the various physical education concepts and information regarding various Olympic Sports.
4. To make students aware about famous sports personalities and various awards given to Sportsperson and coaches.
5. To educate students regarding various career opportunities in the sports management, sports coaching, sports industry, health and fitness, sports infrastructure, yoga, etc.
6. The course is designed primarily to educate those interested in becoming a Physical Literacy Trainer/Ambassador as well as those who wish to stay lifelong active and want to influence others to be active for life.

1.3 Salient features of the course:

1. The course is designed to enhance the Competency, attitude and skills related knowledge to Physical Literacy, health & fitness, Sports & Yoga.
2. The course is design to implemented as per CBCS pattern .

1.4 Utility of the course:

1. The course may provide opportunity in the field of physical education, sports management, health & fitness, yoga, etc.
2. The course is significant to enhance the abilities of the student to work in the different fields of physical education in the area of coaching, event management, health & fitness, yoga etc.
3. The professional abilities and personality of the students may be enhanced.

1.5 Program outcomes:

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

1. The curriculum would enable the pass out students to be entrepreneur (to start their own fitness center, gym, yoga studio etc.) and device appropriate fitness program for different genders and age groups at all level
2. The curriculum would enable to officiate, supervise various sports events and organize sports events.
3. Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.
4. The student learns to plan, organize and execute sports events.
5. Student will learn theoretical and practical aspects of game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.
6. Student acquires the knowledge of opted games, sports and yoga and also learns the technical and tactical experience of it.
7. Student will learn to apply knowledge of Physical fitness and exercise management to lead better quality life.
8. Students will understand and learn different dimension of active life style.
9. Student will learn the knowledge of nutrition and diet.
10. Students will be able to assess the physical fitness in a scientific way.
11. The students will be able to continue professional courses and research in Physical Education, sports and yoga.
12. It helps the student to understand theory and practical aspects of physical literacy. These aspects include role of motivation and confidence, how to focus on positive experience, new styles of teaching, inclusive session planning and review the progress in physical activities.

1.6 Programme Duration: The structure of Sports & Physical Literacy has two semesters in total covering a period of two years.

1.7 Duration of the Course:. First Year comprises two semesters. Each semester will have theory paper 30 marks for End Semester Examination and 20 marks for Internal Evaluation for each paper.

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

1.9 Medium of Instruction: English

1.10 Course Structure

Credits: 02 **Lectures: 30** **Marks: 50**

Unit Number	Title of the Unit	No. of Lecture	No. of Credits
1	**Introduction to Sports, Physical Literacy, Health & fitness and Yoga** 1.1 Meaning and Definition of Sports, Physical Literacy, Health & Fitness and Yoga 1.2 Aim, Objectives & Importance of Sports, Physical Literacy, Health & Fitness and Yoga 1.3 History of Sports, Physical Literacy, Physical Education and Yoga 1.4 Modern trends of Sports, Physical Literacy, Health & Fitness and Yoga	15	1

2	**Introduction to Structure of Sports associations, Fitness Training & Yogic Asanas** 2.1 Various government schemes, awards and famous sports personalities 2.2 Sports Structure of Sports Federations, Khelo India, Sports Tournaments of University of Mumbai and Indian Olympic Association 2.3 Fundamental Principles of Fitness training and Yoga 2.4 Components of health related and skill related physical fitness 2.5 Types of Yogic practices – Asanas, Pranayama and Meditation	15	1

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.
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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.
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10. Kumar, Ajith. (1984) Yoga Pravesha. Bengaluru: Rashtrothanna Prakashana.
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
13. Gharote, M. L. & Ganguly, H. (1988). Teaching methods for yogic practices. Lonawala: Kaivalyadhama.
14. Pinto John and Roshan Kumar Shetty (2021) Introduction to Physical Education, Louis Publications, Mangalore
15. Shekar, K. C. (2003). Yoga for health. Delhi: Khel Sahitya Kendra.
16. Amit Arjun Budhe, (2015) Career aspects and Management in Physical Education, Sports Publication, New Delhi
17. Pinto John and Ramachandra K (2021) Kannada Version, Daihika Shikshanada Parichaya, Louis

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

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:

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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
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9. Ram, Social Problems in India.
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12. Barrett, R. (2013). The Values-driven Organisation: Unleashing Human Potential for Performance andProfit. London: Fulfilling Books
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AC – 20/04/2024
Item No. – 6.7 Sem. II (7b)

As Per NEP 2020

University of Mumbai

Syllabus for
Basket of Minor

Board of Studies in Statistics	
UG First Year Programme	
Semester - II	
Title of Paper	**Credits 2/ 4**
I) Statistical Methods-II	**Credits 2**
II)	
III)	
From the Academic Year	**2024-25**

Semester-II
Minor-II
Name of the course: Statistical Methods-II

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	Introduction: Statistical methods-II course is focuses on to equip students with basic theory of continuous probability distributions, basic theory of estimation and testing of hypothesis concept. Students will learn basic continuous distribution such as exponential, uniform and normal distribution and their application in real life problems. Also student will learn to find estimate and estimator by method of estimation and test statistics. This course will be useful for science, humanity and commerce faculty also. This course will be applicable to various fields to analyze their data. This course is focuses practical as well as theoretical aspects of basic statistics along with subjects from psychology, Economics, sociology, commerce, Computers, Mathematics, IT etc. There is growing demand for highly skilled statisticians in the 21st century in many fields including government, banking sector, health sciences, veterinary sciences, agricultural sciences, business, and social sciences etc
2	**Vertical :**	Minor
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**: Students will be able to, 1. Understand the fundamental concepts of continuous probability distributions. 2. Study the concept of estimate and estimator. 3. Understand the concept of testing of hypothesis and large sample test
8	**Course Outcomes**: **Students Should be able to,** 1. Explain the continuous probability distributions such as Uniform, Exponential, Normal distributions and apply to real life applications. 2. Compute mean, variance and standard deviations for continuous probability distributions. 3. Apply testing of hypothesis technique to solve statistical problems.

9	**Modules**:-	**Lectures**
	Module 1: Continuous Probability Distributions	
	• Concept of continuous random variable, probability density function and its properties. Cumulative distribution functions of continuous random variables and its properties. • Definition and derivation of mean, variance and median of Uniform and Exponential distributions. Memory less property of Exponential distribution. i. Normal distribution. Properties of Normal distribution (without proof). ii. Normal approximation to Binomial and Poisson distribution (statement only). iii. Properties of Normal curve. Use of normal tables.	10
	Module 2: Estimation	**10**
	• Sampling from a distribution: Concept of a statistic, parameter ,estimate and estimator, sampling distribution of statistic. • Concept of bias and standard error of an estimator. • Central Limit theorem (statement only).and properties on Expectation and variance of random variables with proof. • Joint probability mass function of two discrete random variables. • Marginal and conditional distributions. • Covariance and Coefficient of Correlation. Independence of two random variables. • Sampling distribution of sample mean and sample proportion. (For largesample only)	

	• Standard errors of sample mean and sample proportion. • Point and Interval estimate of single mean, single proportion from sample of large size. • Point and interval estimate of difference between two means and proportions.	
	Module 3: Testing of Hypothesis and Large Sample Test	**10**
	Testing of hypothesis: • Concept of hypothesis • Simple and composite hypothesis • Null and alternate hypothesis • Test statistic, Critical region, Types of error, Level of significance and power of the test. **Large sample tests:** • For testing specific value of population mean • For testing specific value in difference of two means • For testing specific value of population proportion • For testing specific value of difference of population proportion(development of critical region is not expected)	

11	**Reference Books** **Reference Books** 1. Saxena S., Kapoor J. N., Mathematical Statistics, Sultan Chand & Sons, Delhi, 2010 2. Gupta S. P, Statistical Methods, Sultan Chand and Sons, New Delhi, 2002 3. Kapoor V. K, Gupta S. C, Fundamental of Mathematical Statistics, S Chand & Sons, Delhi, 2008 4. Grewal P. S. Methods of Statistical Analysis, Sterling Publishers, 1990 5. Mukhopadyay P., An Introduction to the theory of Probability, World Scientific Publishing Company,2011 1. Mukhopadhyay P. An Introduction to the Theory of Probability, World Scientific Publishing Company, 2011. 2. Grewal P. S, Methods of Statistical Analysis, Sterling Publishers,

	1990 3. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand and Sons 4. Agarwal B. L, Basic Statistics, New Age International P Ltd. Delhi, 2015

Format of Question Paper:

Internal Continuous Assessment: (20 marks)

Assignment/viva Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)	**Class Test**	**Total**
05	15	20

Semester End Examination: (30 marks)

Semester End Examination will be of 30 marks of 01 hour duration covering entire syllabus of the semester. All questions are Compulsory.

Theory Question Paper Pattern:

Q 1	Attempt any one question out of two questions (Module I and II)	Max. marks: 10
Q 2	Attempt any two questions out of three questions (Module I)	Max. marks: 10
Q 3	Attempt any two questions out of three questions (Module II)	Max. marks: 10

Sign of the BOS Chairman
Dr. Santosh Gite
Board of Studies in Statistics

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

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

AC – 20.04.2024
Item No. – 5.4 (N) Sem I (16a)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of OE	
Board of Studies in Mass Media	
UG First Year Programme	
Semester I	
Title of Paper	**Credits 2**
Content Writing	**2**
From the Academic Year	**2024-2025**

CONTENT WRITING

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	A content writing course is designed to equip students with the understanding and the skills required to create compelling, effective, and engaging written content for various platforms and purposes.
2	**Vertical :**	Open Elective
3	**Type :**	Theory
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: (List some of the course objectives) 1. To understand the role of content writing in marketing and communication strategies. 2. To review essential grammar rules, punctuation, and writing style guidelines. 3. To understand basic principles of content writing apt for different platforms and different target audiences	
8	**Course Outcomes**: (List some of the course outcomes) 1. To provide students with tools that would help them communicate effectively. 2. Understanding crisp writing as part of Mass Communication 3. The ability to draw the essence of situations and develop clarity of thought.	

9	**Modules**:- Per credit One module can be created
	Module 1: FOUNDATION
	1. **Grammar Refresher:** With special emphasis on use of punctuations, prepositions, capital letters and lower case 2. **Vocabulary building:** Meaning, usage of words , acronyms 3. **Common errors:** Homophones and common errors in English usage. 4. **Editing Skills:** Identifying redundant words and phrases and eliminating these. 5. **Essentials of good writing:** With emphasis on writing with clarity, logic and structure, Structuring a story, Creating a flow,
	Module 2: WRITING TIPS AND TECHNIQUES
	1. **Writing tickers/ scrolls:** For television news 2. **Writing social media post:** Twitter and for other social networks 3. **Writing briefs/snippets:** News briefs, Lifestyle and entertainment snippets 4. **Caption writing:** Picture stories etc 5. **Writing headlines:** News headlines and feature headlines
	Module 3: PRESENTATION TOOLS AND TECHNIQUES
	1. **Power Point Presentation:** Use of Power Point tools, Power Point to Pdf Power Point to self-animated presentation, Auto timing of Power Point presentation 2. **Info graphic:** Colour selection, Use of clip art, Use of Power Point smart tools, Minimalist animation for maximum impact 3. **Three minute presentation:** Content for single slide, Uses of phrases, Effective word selection, Effective presentation 4. **Google Advance search:** How to select relevant information, Locating authentic information, How to gather information for domestic and international websites 5. **Plagiarism:** How to do a plagiarism check, Paraphrasing, Citation and referencing style
	Module 4: WRITING FOR THE WEB
	1. **Content is King:** Importance of content 2. **Less is More:** Writing for print media/ social media like Twitter, etc 3. **Copywriting:** Ad campaigns (creative, witty and attractive) 4. **Realtime Content:** Difference in writing for print vs digital 5. **Keywords:** Designing keywords for Search Engine Optimization

10 **Text Books:**

1. The Editor's Toolbox by Buck Ryan and Michael O' Donnell, Surjeet Publication
2. Writing for the Mass Media by James Glen Stovall
3. A Handbook of Rhetorical Devices by Robert A Harris

11 **Reference Books:**

1. The Editor's Toolbox by Buck Ryan and Michael O' Donnell, Surjeet Publication
2. Writing for the Mass Media by James Glen Stovall
3. A Handbook of Rhetorical Devices by Robert A Harris

12	**Internal Continuous Assessment: 40%**	**External, Semester End Examination 60% Individual Passing in Internal and External Examination**
13	**Continuous Evaluation through:** Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)	1. **Writing Captions and Headlines:** Simple writing is difficult. This assignment will help the learners to grasp the most essential aspect of a story and present these as headlines and captions. 2. **A three- minutes power point presentation:** This assignment challenges the learners to draw the essence of elaborate reports, research papers and present in three minutes. 3. **Word Game/ Quiz:** This is an exciting way to get learners engaged in vocabulary building.

14 **Format of Question Paper:** for the final examination

Question.1 is compulsory.
Attempt any 1 from Q2. And Q3.
Each question carries 15 Marks

Question No	Questions	Marks
Q 1	Practical/ Case study	15
Q 2	Practical/ Theory	15
Q 3	Practical/ Theory	15
	TOTAL	**30**

	Note: 1. Equal Weightage is to be given to all the modules. 2. Internal option shall be given in Q1. 3. 15 marks question may subdivide into 7.5 marks each. Internal option shall be given, i.e attempt any two out of three. For direct 15 Marks question option should be given. Attempt any one out of two. 4. Use of simple calculator is allowed in the examination. 5. Wherever possible more importance is to be given to the practical problems.

Sign of the BOS Chairman
Dr. Navita Kulkarni
BoS in Mass Media

Sign of the
Offg. Associate Dean
Prof. Suchitra Naik
Humanities

Sign of the Offg. Dean
Dr. Anil Singh
Humanities

AC – 20.04.2024
Item No. – 5.4 (N) Sem I (16b)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of OE	
Board of Studies in Mass Media	
UG First Year Programme	
Semester II	
Title of Paper	**Credits 2**
Communication in Digital Age	**2**
From the Academic Year	**2024-2025**

COMMUNICATION IN DIGITAL AGE

Sr. No.	Heading	Particulars
1	**Description the course :** **Including but Not limited to :**	Communication in Digital Age aims to equip students with the skills and knowledge needed to navigate and effectively communicate in a rapidly evolving digital landscape.
2	**Vertical :**	Open Elective
3	**Type :**	Theory
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: (List some of the course objectives) 1. To study the basics of communication in digital era 2. To explore the growth of digital communication platforms and its impact on communication 3. To outline the role of digital communication in framing online identity and relationships 4. To study diverse digital platforms and their contribution in formulating effective communication strategies for virtual collaborations 5. To acquire digital literacy skills in order to evaluate, interpret and create digital content	
8	**Course Outcomes**: (List some of the course outcomes) 1. Learners will develop proficiency in using a variety of digital communication tools and platforms to effectively convey messages and engage with audiences. 2. Learners will be able to analyze digital communication trends and implement effective strategies to achieve specific communication goals. 3. Learners will realize the ethical and legal considerations associated with digital communication, ensuring responsible and compliant practices.	

9	**Modules**:- Per credit One module can be created
	Module 1: COMMUNICATION IN DIGITAL AGE
	1. Introduction 2. Impact of Digitalization on society, culture and communication 3. Digital Communication channels and multimedia communication tools 4. Influence of Digital media on interpersonal communication
	Module 2: INFORMATION MANAGEMENT
	1. Usage of online resources for research, personal development, career advancements 2. Importance of tools for information management like Search engine, Bookmarks, cloud storage, more 3. Digital footprint
	Module 3: INTERPERSONAL COMMUNICATION IN THE DIGITAL WORLD
	1. Self-presentation in online communities and online identity 2. Dynamics of interpersonal communication and conflict resolution 3. Understanding nonverbal communication cues in digital communication 4. Norms for polite and respectful communication on digital media
	Module 4: COMMUNICATION IN DIGITAL WORKPLACE
	1. Establishing effective communication in virtual office spaces 2. Role of digital communication in leadership and management practices 3. Techniques to facilitate virtual meetings, collaborations and employee engagement 4. Digital interface for crisis communication 5. Using digital channels of communication for brand building
10	**Text Books:** 1. Rheingold, Howard. (2014). Net Smart: How to Thrive Online. 2. Jenkins, Henry. (2006). Convergence Culture: Where Old and New Media Collide. 3. Boyd, Danah. (2014). It's Complicated: The Social Lives of Networked Teens. 4. Turkle, Sherry. (2011). Alone Together: Why We Expect More from Technology and Less from Each Other. 5. Castells, Manuel. (2009). Communication Power

<table>
<tr><td>11</td><td colspan="2">Reference Books:
1. Rheingold, Howard. (2014). Net Smart: How to Thrive Online.
2. Jenkins, Henry. (2006). Convergence Culture: Where Old and New Media Collide.
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4. Turkle, Sherry. (2011). Alone Together: Why We Expect More from Technology and Less from Each Other.
5. Castells, Manuel. (2009). Communication Power</td></tr>
<tr><td>12</td><td>Internal Continuous Assessment: 40%</td><td>External, Semester End Examination 60%
Individual Passing in Internal and External Examination</td></tr>
<tr><td>13</td><td>Continuous Evaluation through:
Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)</td><td>1. ORAL & PRACTICAL PRESENTATIONS
2. PROJECTS / ASSIGNMENTS
3. DEBATES /GROUP DISCUSSION
4. OPEN BOOK TESTS
5. QUIZ</td></tr>
<tr><td>14</td><td colspan="2">Format of Question Paper: for the final examination

Question.1 is compulsory.
Attempt any 1 from Q2. And Q3.
Each question carries 15 Marks

<table>
<tr><th>Question No</th><th>Questions</th><th>Marks</th></tr>
<tr><td>Q 1</td><td>Practical/ Case study</td><td>15</td></tr>
<tr><td>Q 2</td><td>Practical/ Theory</td><td>15</td></tr>
<tr><td>Q 3</td><td>Practical/ Theory</td><td>15</td></tr>
<tr><td></td><td>TOTAL</td><td>30</td></tr>
</table>
Note:
1. Equal Weightage is to be given to all the modules.
2. Internal option shall be given in Q1.
3. 15 marks question may subdivide into 7.5 marks each. Internal option shall be given, i.e attempt any two out of three. For direct 15 Marks question option should be given. Attempt any one out of two.
4. Use of simple calculator is allowed in the examination.
5. Wherever possible more importance is to be given to the practical problems.</td></tr>
</table>

Sign of the BOS Chairman
Dr. Navita Kulkarni
BoS in Mass Media

Sign of the
Offg. Associate Dean
Prof. Mala Lalwani
Humanities

Sign of the Offg. Dean
Dr. Anil Singh
Humanities

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:** **<u>मूल्यांकन प्रारूप</u>** ***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

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 –
Item No. –

As Per NEP 2020

University of Mumbai

Syllabus for Basket of VES	
Board of Studies in Value Education	
UG First Year Programme	
Semester	**II**
Title of Paper	**Credits 2**
I) Environmental Management & Sustainable Development -II	
From the Academic Year	**2024-25**

Name of the Course: Environmental Management & Sustainable Development -II

Sr. No.	Heading	Particulars
1	Description the course : Including but Not limited to :	This introductory course explores the interconnectedness of our environment and the challenges it faces. Designed for students from all faculties, it equips you with a foundational understanding of: • Ecosystems and biodiversity: Explore the intricate web of life on Earth and the importance of species diversity. • Human impact: Analyse how human activities affect natural resources, climate, and pollution. • Sustainability: Discover principles for living in harmony with the environment and meeting our needs without compromising future generations. Regardless of major, environmental awareness is crucial. This course empowers learner to: • Become an informed citizen: Make responsible choices and advocate for environmental protection. • Understand complex environmental issues: Gain a holistic view of challenges like climate change and pollution. Explore solutions and career paths: Discover potential careers in environmental management, conservation, or sustainable development.
2	Vertical :	**Open Elective**
3	Type :	Theory / ~~Practical~~
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 create and disseminate knowledge to the students about environmental problems at local, regional and global scale. 2. To introduce about ecosystems, biodiversity and to make aware for the need of	

	conservation. 3. To sensitize students towards environmental concerns, issues, and impacts of human population. 4. To prepare students for successful career in environmental departments, research institutes, industries, consultancy, and NGOs, etc.
8	**Course Outcomes:** 1. Use principles of Environmental Science for explaining sustainable development and its related ethical concerns 2. Display scientific perspective for issues confronting our present day environment. 3. Analyze the national and global environmental issues relating air, water, soil, and land use, biodiversity, and pollution. 4. Explain the Role of an individual in relation to human population and environmental pollution. 5. Recognize the importance of collective efforts for environmental sustainability as reflected in various treaties, conventions and laws
9	**Modules:-**
	Unit I: Environmental Pollution and Health (8 lectures)
	Understanding pollution: Production processes and generation of wastes; Assimilative capacity of the environment; Definition of pollution; Point sources and non-point sources of pollution. Air pollution: Sources of air pollution; Primary and secondary pollutants; Criteria pollutants- carbon monoxide, lead, nitrogen oxides, ground-level ozone, particulate matter and Sulphur dioxide; Other important air pollutants- Volatile Organic compounds (VOCs), Peroxyacetyl Nitrate (PAN), Polycyclic aromatic hydrocarbons (PAHs) and Persistent organic pollutants (POPs); Indoor air pollution; Adverse health impacts of air pollutants; National Ambient Air Quality Standards. Water pollution: Sources of water pollution; River, lake and marine pollution, groundwater pollution; water quality parameters and standards; adverse health impacts of water pollution on human and aquatic life. Soil pollution and solid waste: Soil pollutants and their sources; Solid and hazardous waste; Impact on human health. Noise pollution: Definition of noise; Unit of measurement of noise pollution; Sources of noise pollution; Noise standards; adverse impacts of noise on human health. Thermal and Radioactive pollution: Sources and impact on human health and ecosystems.
	Unit II: Environmental Management (7 lectures)
	Introduction to environmental laws and regulation: Constitutional provisions- Article 48A, Article 51A (g) and other derived environmental rights; Introduction to environmental legislations on the forest, wildlife and pollution control. Environmental management system: ISO 14001 Life cycle analysis; Cost-benefit analysis Pollution control and management; Waste Management- Concept of 3R (Reduce, Recycle and Reuse) and sustainability; Ecolabeling /Ecomark scheme. Introduction to Millennium Development Goals, Sustainable Development Goals, & Mission Life.

	Unit III: **Environmental Treaties and Conventions (8 lectures)**
	1) Major International Environmental Agreements: Stockholm Conference on Human Environment,1972, Ramsar Convention on Wetlands, 1971, Montreal Protocol, 1987, Basel Convention (1989), Earth Summit at Rio de Janeiro,1992, Kyoto Protocol, 1997, Earth Summit at Johannesburg, 2002. 2) Major Indian Environmental Legislations: The Wild Life (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Forest (Conservation) Act, 1980; The Air (Prevention and Control of Pollution) Act, 1981; The Environment (Protection) Act, 1986; The Biological Diversity Act, 2002
	Unit IV: **Case Studies and Field Survey (7 lectures)**
	The students are expected to be engaged in some of the following or similar identified activities: • Discussion on one national and one international case study related to the environment and sustainable development. • Field visits to identify local/regional environmental issues, make observations including data collection and prepare a brief report. • One student one tree initiative. • Documentation of campus biodiversity. • Campus environmental management activities such as solid waste disposal, water management, and sewage treatment.
10	**Text Books** 1. Ahluwalia, V. K. (2015). Environmental Pollution, and Health. The Energy and Resources Institute (TERI). 2. Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/standards/ 3. Masters, G. M., & Ela, W. P. (2008). Introduction to environmental engineering and science (No. 60457). Englewood Cliffs, NJ: Prentice Hall. 4. Jørgensen, Sven Marques, Erik João Carlos and Nielsen, Søren Nors (2016) Integrated Environmental Management, A transdisciplinary Approach. CRC Press. 5. Barrow, C. J. (1999). Environmental management: Principles and practice. Routledge. 6. Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press. 7. Richard A. Marcantonio, Marc Lame (2022). Environmental Management: Concepts and Practical Skills. Cambridge University Press. 8. UNEP (2007) Multilateral Environmental Agreement Negotiator's Handbook, University of Joensuu, ISBN 978-952-458-992-5 9. Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf 10. Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf 11. India Code – Digital repository of all Central and State Acts: https://www.indiacode.nic.in/ 12. University Grants Commission, D.O.No.F. 14-5/2015(CPP-II) dated 2nd August1 2019.

12	**Internal Continuous Assessment: 40%**	**Semester End Examination : 60%**
13	**Continuous Evaluation through:** Quizzes, Class Tests, presentation, project, role play, creative writing, Field Visits, Case Studies, assignments, One Student one tree initiative etc. (at least 4)	
14	**Format of Question Paper:** for the final examination For OE: External - 30 Marks (2 Credits) Internal - 20 Marks Question Paper Format for 30 Marks Format of Question Paper: 30 Marks per paper Semester End Theory Examination: 1. Duration - These examinations shall be of one hour and 30 minutes duration. 2. Theory question paper pattern: There shall be 04 questions each of 10 marks out of which students will attempt ANY THREE	

Signature:
Prof. Kavita Laghate
Chairman of Board of Studies in Value Education

University of Mumbai

Website – mu.ac.in
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/2024-25/234 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

	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

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

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
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9. Ram, Social Problems in India.
10. Arnold, K. (2018). What is R.E.S.P.E.C.T. When it comes to teamwork? Available at: https://www.extraordinaryteam.com/what-is-r-e-s-p-e-c-t-when-it-comes-to-teamwork/
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13. Barret Values Center (2018). Values-based leadership. Available at: https://www.valuescentre.com/mapping-values/leadership/values-based- leadership
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Mumbai – 400 032.
Tel. 022-68320033

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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

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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

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.*