AC – 20/04/2024
Item No. – 6.6 Sem. I (6a)

As Per NEP 2020

University of Mumbai

Syllabus for Basket of Open Elective Courses	
Board of Studies in Computer Science	
UG First Year Programme	
Semester	**I**
Title of Paper	**Credits 2/ 4**
I) Open-Source Technologies	**2**
From the Academic Year	**2024 – 2025**

Open Elective Courses

Name of the Course: Open-Source Technologies

Sr. No.	Heading	Particulars
1	**Description the course:**	**Introduction:** This course offers a comprehensive exploration of open-source technologies, providing students with valuable skills and knowledge essential for success in today's technology-driven world. **Relevance:** In an era where open-source software plays a pivotal role in various industries, understanding its principles and applications is crucial. This course equips students with the necessary expertise to thrive in a rapidly evolving technological landscape. **Usefulness:** The practical skills acquired in this course, such as proficiency in open-source tools and collaboration techniques, are highly transferable and applicable across a wide range of professions and industries. **Application:** Students will learn to apply their knowledge of open-source technologies to solve real-world problems, making them valuable assets in any organization seeking innovative and cost-effective solutions. **Interest:** The hands-on approach and diverse range of topics covered in this course make it engaging and captivating for students with varying interests in technology, software development, and creative industries. **Connection with Other Courses:** This course complements other technology-related courses by providing a deeper understanding of open-source principles and practical applications, enhancing students' overall skill set and knowledge base. **Demand in the Industry:** With the increasing adoption of open-source technologies by businesses and organizations

		worldwide, professionals with expertise in this area are in high demand. Graduates of this course are well-positioned to meet this demand and excel in their careers. **Job Prospects:** Completion of this course opens up a multitude of career opportunities in software development, IT management, web development, content creation, and more. Employers value candidates with hands-on experience and proficiency in open-source technologies, making job prospects bright for graduates of this course.
2	**Vertical:**	Open Elective
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 understand open-source concepts, benefits, and successful projects. **CO 2.** To gain practical skills in using open-source tools for various tasks. **CO 3.** To learn collaboration techniques using GitHub and contribute to open-source projects. **CO 4.** To explore advanced open-source technologies like Linux, VirtualBox, and Docker. **CO 5.** To analyze the role of open-source software in business, education, and society.	
8	**Course Outcomes (OC):** After successful completion of this course, students would be able to - **OC 1.** To understand the principles and significance of open-source software, along with its practical applications. **OC 2.** Proficiently use a variety of open-source tools such as LibreOffice, GIMP, Shotcut, and Blender for word processing, photo editing, video editing, and 3D modeling respectively. **OC 3.** Effectively collaborate on software projects using version control systems like GitHub, and contribute to open-source projects. **OC 4.** Apply their knowledge of open-source technologies to solve real-world problems in various domains including business and education.	
9	**Modules:** **Module 1: Introduction to Open-Source and Practical Applications (30 hours)**	
	<u>Basics of Open Source Technologies</u>	

	Understanding Open-Source Concepts: What is Open Source: Introduction to the concept of open-source software and its importance. Benefits of Open Source: Exploring the advantages of using open-source software. Examples and Success Stories: Case studies of successful open-source projects like Linux, Android, and Wikipedia. **Practical Applications of Open-Source Software** Introduction to LibreOffice: Hands-on session on using LibreOffice for word processing, spreadsheets, and presentations. Exploring GIMP: Practical tutorial on using GIMP for photo editing and manipulation. Introduction to Shotcut: Hands-on experience with Shotcut for video editing and creation. Exploring Blender: Introduction to Blender for 3D modeling and animation. **Understanding Open-Source Collaboration** Introduction to GitHub: Basics of using GitHub for version control and collaboration. Collaboration with GitHub: Understanding how to collaborate on multi-developer projects using GitHub, including making and reviewing pull requests. Contributing to Wikipedia: Practical session on contributing to Wikipedia by editing articles and adding content.
	Module 2: Advanced Open-Source Technologies and Projects (30 hours)
	<u>Exploring Open-Source Ecosystem</u> **Open-Source Operating Systems:** Introduction to Linux: Hands-on session on using Linux operating system, including basic commands, file system navigation, and package management. Introduction to open-source operating systems like Linux and Android, exploring their features and usability. Virtualization and Containerization: Hands-on experience with VirtualBox and Docker for creating and managing virtual machines and containers. **Hands-on Projects with Open-Source Tools:** Web Development with Apache: Practical session on setting up and configuring Apache web server for hosting websites. Content Management with WordPress: Introduction to WordPress for creating and managing websites and blogs.

	Understanding video editing with Shotcut: Advanced session on video editing techniques with Shotcut software. **Open Source in Real-world Scenarios:** Open Source in Business: Understanding how businesses leverage open-source technologies for innovation and cost-effectiveness. Open Source in Education: Exploring the use of open-source software in educational institutions and learning environments. **Ethics and Social Impact of Open Source:** Open Source and Society: Discussion on the ethical and social implications of open-source technology, including its role in government, business, and education.
10	**Text Books** 1. "Open-Source Technology", Kailash Vadera&Bhavyesh Gandhi, University Science Press, Laxmi Publications, 2009 2. 2. "Open-Source Technology and Policy", Fadi P. Deek and James A. M. McHugh, Cambridge University Press, 2008.
11	**Reference Books** 1. "Perspectives on Free and Open-Source Software", Clay Shirky and Michael Cusumano, MIT press. 2. "Understanding Open Source and Free Software Licensing", Andrew M. St. Laurent, O'Reilly Media. 3. "Open Source for the Enterprise", Dan Woods, GautamGuliani, O'Reilly Media
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 10 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

OPEN ELECTIVE COURSES

Year	Sem.	Course Code	Course Title	No of Credits	No of Lectures Hours	Total Credits
1	I	OE1	Open Source Technologies	2	30	4
		OE2	Web Designing	2	30	
	II	OE3	Social Media Marketing	2	30	4
		OE4	Multimedia & Design	2	30	
II	III	OE5	Cyber & Digital Safety	2	30	2
	IV	OE6	Data Analytics	2	30	2

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

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

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