



॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड - ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत
राष्ट्रीय शैक्षणिक धोरण-२०२० नुसार
पदवी तृतीय वर्षाचे अभ्यासक्रम
(Syllabus) शैक्षणिक वर्ष २०२६-२७
पासून लागू करण्याबाबत.

परिपत्रक

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक २२ एप्रिल २०२६ रोजी संपन्न झालेल्या मा.विद्यापरिषद बैठकीतील विषय क्र.०८/६४-२०२६ च्या ठरावानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरण-२०२० नुसार पदवी तृतीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२६-२७ पासून लागू करण्यास मा.विद्यापरिषदेने मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील बी.एस्सी. तृतीय वर्षाचे खालील विषयाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२६-२७ पासून लागू करण्यात येत आहे.

01	B.Sc. III Year Computer Maintenance
02	B.Sc. III Year Information Technology
03	B.Sc. III Year Computer Science
04	B.C.A. III Year (Single Major)
05	B.Sc. III Year Computer Science (Single Major)

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

'ज्ञानतीर्थ' परिसर,

विष्णुपुरी, नांदेड - ४३१ ६०६.

जा.क्र.:शै-१/परिपत्रक/पदवी/बीएस्सी/२०२६-२७/ 93

दिनांक : १०.०७.२०२६

उपकुलसचिव
शैक्षणिक (१-अभ्यासमंडळे) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :-

- १) मा. कुलगुरू महोदयांचे कार्यालय, प्रस्तुत विद्यापीठ.
- २) मा. प्र.कुलगुरू महोदयांचे कार्यालय, प्रस्तुत विद्यापीठ.
- ३) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
- ४) मा. संचालक, परिक्षा व मूल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
- ५) मा. प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
- ६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. यांना देवून कळविण्यात येते की, परिपत्रक अभ्यासक्रम संकेतस्थळावर प्रसिध्द करण्यात यावेत.

**SWAMI RAMANAND TEERTH MARATHWADA
UNIVERSITY, NANDED - 431 606 (MS)**



**(Credit Framework and Structure of Four Year UG Program with
Multiple Entry and Exit Option as per NEP-2020)**

SYLLABUS

Of

**UNDERGRADUATE PROGRAMME OF
SCIENCE & TECHNOLOGY**

Major in **Information Technology**

Under the Faculty of Science & Technology

B. Sc. Third Year

**Effective from the Academic year 2026 – 2027
(As per NEP-2020)**

From the Desk of the Dean, Faculty of Science and Technology

Swami Ramanand Teerth Marathwada University, Nanded, enduring to its vision statement “Enlightened Student: A Source of Immense Power”, is trying hard consistently to enrich the quality of science education in its jurisdiction by implementing several quality initiatives. Revision and updating curriculum to meet the standard of the courses at national and international level, implementing innovative methods of teaching-learning, improvisation in the examination and evaluation processes are some of the important measures that enabled the University to achieve the 3Es, the equity, the efficiency and the excellence in higher education of this region. To overcome the difficulty of comparing the performances of the graduating students and also to provide mobility to them to join other institutions the University has adopted the cumulative grade point average (CGPA) system in the year 2014-2015. Further, following the suggestions by the UGC and looking at the better employ ability, entrepreneurship possibilities and to enhance the latent skills of the stakeholders the University has adopted the Choice Based Credit System (CBCS) in the year 2018-2019 at graduate and post-graduate level. This provided flexibility to the students to choose courses of their own interests. To encourage the students to opt the world-class courses offered on the online platforms like, NPTEL, SWAYM, and other MOOCS platforms the University has implemented the credit transfer policy approved by its Academic Council and also has made a provision of reimbursing registration fees of the successful students completing such courses.

SRTM University has been producing a good number of high calibre graduates; however, it is necessary to ensure that our aspiring students are able to pursue the right education. Like the engineering students, the youngsters pursuing science education need to be equipped and trained as per the requirements of the R&D institutes and industries. This would become possible only when the students undergo studies with an updated and evolving curriculum to match global scenario.

Higher education is a dynamic process and in the present era the stakeholders need to be educated and trained in view of the self-employment and self-sustaining skills like start-ups. Revision of the curriculum alone is not the measure for bringing reforms in the higher education, but invite several other initiatives. Establishing industry-institute linkages and initiating internship, on job training for the graduates in reputed industries are some of the important steps that the University would like to take in the coming time. As a result, revision of the curriculum was the need of the hour and such an opportunity was provided by the New Education Policy 2020. National Education Policy 2020 (NEP 2020) aims at equipping students with knowledge, skills, values, leadership qualities and initiates them for lifelong learning. As a result the students will acquire expertise in specialized areas of interest, kindle their intellectual curiosity and scientific temper, and create imaginative individuals.

The curriculum given in this document has been developed following the guidelines of NEP-2020 and is crucial as well as challenging due to the reason that it is a transition from general science based to the discipline-specific-based curriculum. All the recommendations of the Sukanu Samiti given in the NEP Curriculum Framework-2023 have been followed, keeping the disciplinary approach with rigor and depth, appropriate to the comprehension level of learners. All the Board of Studies (BoS) under the Faculty of Science and Technology of this university have put in their tremendous efforts in making this curriculum of international standard. They have taken care of maintaining logical sequencing of the subject matter with proper placement of concepts with their linkages for better understanding of the students. We take this opportunity to congratulate the Chairman(s) and all the members of various Boards of Studies for their immense contributions in preparing the revised curriculum for the benefits of the stakeholders in line with the guidelines of the Government of Maharashtra regarding NEP-2020. We also acknowledge the suggestions and contributions of the academic and industry experts of various disciplines.

We are sure that the adoption of the revised curriculum will be advantageous for the students to enhance their skills and employ ability. Introduction of the mandatory On Job Training, Internship program for science

background students is praise worthy and certainly help the students to imbibe firsthand work experience, team work management. These initiatives will also help the students to inculcate the workmanship spirit and explore the possibilities of setting up of their own enterprises.

Dr M. K. Patil

Dean

Faculty of Science and Technology

SRTMU, Nanded

From the Desk of Chairman, Board of Studies in Computer Science and Application

Dear Students, Faculty, and Stakeholders,

It gives me immense pleasure to introduce the B.Sc. in Information Technology as Major program, accurately designed to equip students with cutting-edge knowledge and hands-on expertise in the ever-evolving field of Computer Science.

In today's digital era, Information Technology forms the backbone of innovation, driving advancements in Artificial Intelligence, Cybersecurity, Data Science, Web Technologies, and more. Our curriculum is structured to provide a strong theoretical foundation while emphasizing practical, industry-relevant skills that prepare students for global challenges.

Our B.Sc. Information Technology (Major) program offers a comprehensive and future-ready syllabus, covering essential domains such as: Core Programming (C, C++, Java, and Python), Web Development Technology (HTML, CSS, JavaScript, WordPress), Database Management (RDBMS, Data Analysis), Cybersecurity & Networking (Cyber Security, Computer Networks) and Emerging Technologies (Machine Learning, Data Science, Digital Image Processing). With a balanced mix of theory, coding labs, and projects. Students will develop problem-solving abilities, logical reasoning, and creativity that are key traits for a successful career in IT.

We have incorporated industry-demanded courses like Machine Learning, Data Science, and Cybersecurity in the curriculum of B. Sc. T.Y. to ensure graduates are job-ready. Additionally, Web Development using WordPress and Python programming opens doors to freelancing and entrepreneurship opportunities. Beyond Academics, we encourage students to engage in hackathons, internships, and research projects to gain hands-on experience.

As the Chairman of the Board of Studies, I assure you that our program is continuously updated to align with global standards.

We sincerely thank all of the experts who provided their insightful comments and recommendations in order to improve the contents, we have made every effort to take each of them into consideration.

Regards

Prof. Dr Sudhir Jagtap

Chairman, Board of Studies

Computer Science and Applications



Details of the Board of Studies Members in the subject Computer Science and Application under the faculty of Science & Technology of S.R.T.M. University, Nanded

Sr. No.	Name of the Member	Designation	Address	Contact No.
1	Prof Dr Sudhir Baburao Jagtap	Chairman	Swami Vivekananda Mahavidyalaya, Udgir	9422611355
2	Prof Dr Girish Venkatesh Chowdhary	Member	School of Computational Science, SRTMU, Nanded	9421252364
3	Dr Upendra Bhalchandra Parag	Member	School of Computational Sciences, SRTMU, Nanded	9422240301
4	Dr Madhav Motiram Bokare	Member	Institute of Technology and Management, Nanded	9421870580
5	Dr Purushottam Anandrao Kadam	Member	Institute of Information Technology & Management, Nanded	7972098959
6	Dr Gajanan Kurundkar	Member	Shri Guru Buddhiswami Mahavidyalaya, Purna	9850797966
7	Dr Shireeshkumar Rudrawar	Member	DSM's ACS College, Jintur	9421515383
8	Dr Nitish Shankar Zulpe	Member	Computer Science and Information Technology(COCSIT),Latur	9970763030
9	Dr Bhaskar Gangadharrao Koshidgewar	Member	Vai.Dhunda Maharaj Deglurkar College	9423437273
10	Dr Renuka Ramakant Londhe	Member	Rajarshi Shahu Mahavidyalaya (Autonomous),Latur	9545226333
11	Dr Ramesh R. Manza	Member	Dr.Babasaheb Ambedkar Marathwada University, Aurangabad	9421308853
12	Dr Sadanand Awale	Member	Maharashtra Udyagiri Mahavidyalaya Udgir Dist. Latur	9421369569
13	Shri Ajit Bhale	Member	Great Software LabAmar Aamma Jnues Naner Road Pune	02046711000



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology (Three Optional in the First Year)

Credit Framework for Four Year Multidisciplinary Degree Program

with Multiple Entry and Exit

Subject: **Information Technology (CIT)** (Major)

Year & Level	Semester	Optional 1 (Major) <i>(From the same Faculty)</i>		Optional 2 (Minor 1) <i>(From the same Faculty)</i>	Optional 3 (Minor 2) <i>(From the same Faculty)</i>	Generic Elective (GE) <i>(select from Basket 3 of Faculties other than Science and Technology)</i>	Vocational & Skill Enhancement Course	Ability Enhancement Course (AEC) (Basket 4) Value Education Courses (VEC) / Indian Knowledge System (IKS) (Basket 5) <i>(Common across all faculties)</i>	Field Work / Project/Internship/ OJT/ Apprenticeship/ Case Study Or Co-curricular Courses (CCC) (Basket 6 for CCC) <i>(Common across all faculties)</i>	Credits	Total Credits
1	2	3		4	5	6	7	8	9	10	11
3 (5.5)	V	SCITCT1301 (3cr) SCITCP1301 (2cr) SCITCT1302 (3cr) SCITCP1302 (2cr) SCITIKS1301 (2cr) 12 Credits	SCITET1301 (2cr) OR SCITET1302 (2cr) SCITEP1301 (2cr) OR SCITEP1302 (2cr) 4 Credits	--	--	--	VSC 3 SCITVC1301 2 Credits	--	FP1 (4Cr) (FP/CS) SCITFP1301 4 Credits	22	44
	VI	SCITCT1351(3cr) SCITCP1351(2cr) SCITCT1352(3cr) SCITCP1352 (2cr) SCITCT1353 (2cr) 12 Credits	SCITET1351 (2cr) OR SCITET1352 (2cr) SCITEP1351 (2cr) OR SCITEP1352 (2cr) 4 Credits	--	--	--	VSC 4 SCITVC1351 2 Credits	--	OJT SCITOJT1351 4 Credits	22	
Cum. Cr.		56		16	08	08	12	22	10		132



B. Sc. Third Year Semester V (Level 5.5)

Teaching Scheme

Subject	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Major	SCITCT1301	Software Engineering	03	--	03	03	--
	SCITCP1301	Lab Course SE (Practical)	-	02	02	--	04
	SCITCT1302	Programming in VB	03	--	03	03	--
	SCITCP1302	Lab Course VB (Practical)	-	02	02	--	04
	SCITIKS1301	IKS in IT	02	--	02	02	--
Elective	SCITET1301	Programming in PHP	02	--	02	02	--
	SCITEP1301	Lab Course E1-PHP (Practical)	--	02	02	--	04
Vocational Course	SCITVC1301	System Security	--	02	02	--	04
Project	SCITFP1301	Project in IT	--	04	04	--	08
Total Credits			10	12	22	10	24



B. Sc. Third Year Semester V (Level 5.5)

Examination Scheme

[40% Continuous Assessment (CA) and 60% End Semester Assessment (ESA)]

Subject (1)	Course Code (2)	Course Name (3)	Theory/Practical				ESA (8)	Total 7+8 (9)
			Continuous Assessment (CA)					
			Test (4)	Assignment (5)	Attendance (6)	Total (7)		
Major	SCITCT1301	Software Engineering	15	09	06	30	45	75
	SCITCP1301	Lab Course SE (Practical)	10	06	04	20	30	50
	SCITCT1302	Programming in VB	15	09	06	30	45	75
	SCITCP1302	Lab Course VB (Practical)	10	06	04	20	30	50
	SCITIKS1301	IKS in IT	10	06	04	20	30	50
Elective	SCITET1301	Programming in PHP	10	06	04	20	30	50
	SCITEP1301	Lab Course E1-PHP (Practical)	10	06	04	20	30	50
Vocational Course	SCITVC1301	System Security	10	06	04	20	30	50
Field Project	SCITFP1301	Project in IT	20	12	08	40	60	100



B. Sc. Third Year Semester VI (Level 5.5)

Teaching Scheme

Subject	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Major	SCITCT1351	Software Testing	03	--	03	03	--
	SCITCP1351	Lab Course ST (Practical)	-	02	02	--	04
	SCITCT1352	Programming in Java	03	--	03	03	--
	SCITCP1352	Lab Course Java (Practical)	-	02	02	--	04
	SCITICT1353	E-Commerce	02	--	02	02	--
Elective	SCITET1351	Programming in Python	02	--	02	02	--
	SCITEP1351	Lab Course E2-Python (Practical)	--	02	02	--	04
Vocational Course	SCITVC1351	Digital Media	--	02	02	--	04
OJT	SCITOJT1351	On Job Training	--	04	04	--	08
Total Credits			10	12	22	10	24



B. Sc. Third Year Semester VI (Level 5.5)

Examination Scheme

[40% Continuous Assessment (CA) and 60% End Semester Assessment (ESA)]

Subject (1)	Course Code (2)	Course Name (3)	Theory/Practical				ESA (8)	Total 7+8 (9)
			Continuous Assessment (CA)					
			Test (4)	Assignmen t (5)	Attendance (6)	Total (7)		
Major	SCITCT1351	Software Testing	15	09	06	30	45	75
	SCITCP1351	Lab Course ST (Practical)	10	06	04	20	30	50
	SCITCT1352	Programming in Java	15	09	06	30	45	75
	SCITCP1352	Lab Course Java (Practical)	10	06	04	20	30	50
	SCITICT1353	E-Commerce	10	06	04	20	30	50
Elective	SCITET1351	Programming in Python	10	06	04	20	30	50
	SCITEP1351	Lab Course E2-Python (Practical)	10	06	04	20	30	50
Vocational Course	SCITVC1351	Digital Media	10	06	04	20	30	50
OJT	SCITOJT1351	On Job Training	20	12	08	40	60	100

Semester V



Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology
B.Sc. Third Year (Semester V)
Subject: Information Technology

Course Type: Major Theory

Course Title: Software Engineering

Course Code: SCITCT1301

Credits: 03

Max. Marks: 75 [CA:30 & ESA:45]

Lectures: 45 Hrs.

Course / Learning Objectives:

1. Understand Software Engineering Process.
2. Understand Requirements and Components of Software Engineering.
3. Understand software design and software testing fundamentals.

Utility of the course: Confidence of becoming a Software developer in order to get placement as well research activities

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain fundamental concepts, principles, and methodologies of software engineering.
2. Analyze software requirements and prepare Software Requirement Specification (SRS) documents using structured techniques.
3. Apply software design principles, modeling techniques (such as UML), and architectural approaches for developing software solutions.
4. Evaluate different software development models (Waterfall, Prototype, Spiral, Agile) and select suitable approaches for real-world problems.
5. Explain the different concepts regarding Web App and Mobile App design.

Unit No.	Title of Unit & Contents	Hrs.
I	The Nature of Software & Software Engineering	15
	The Nature of Software, The Changing Nature of Software, Defining the Discipline, Software engineering process, Software engineering practice, Software Myths	
II	Software Process Structure & Models and Agile Development	10
	A Generic process model, defining a framework activity, Process patterns, Process Assessment & improvement, Introduction to Agility, Agility & Cost of Change, Agility principles.	
III	Understanding Requirements & Design Concepts	10
	Engineering, Building the analysis model, Requirement Analysis, Design within the context of software engineering, the design process, Software Architecture, Designing Class based Components	
IV	Web App & Mobile App Design	10

Unit No.	Title of Unit & Contents	Hrs.
	Web App Design Quality, Design Goals, A Design Pyramid for Web Apps, Web App Interface Design, The Challenges in Mob. App design, Developing Mobile Apps, Mobile App Design-Best Practices	

Learning Resources:

1. Software Engineering A practitioner's approach By Rogers S. Pressman, 8th Ed. (McGraw Hill)
2. Software Engineering Principles and practices By Waman S. Jawadekar (Tata McGraw Hill)



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Major Practical

Course Title: Lab Course SE

Course Code: SCITCP1301

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60Hrs.

This is Suggested Practical Experiments for Software Engineering Laboratory:

- 1. Study and Comparison of Software Development Life Cycle (SDLC) Models**
Prepare a comparative analysis of Waterfall, Prototype, Spiral, Incremental, and Agile models.
- 2. Preparation of Software Requirement Specification (SRS) Document**
Develop an SRS document for a mini-project such as Library Management System, Student Information System, or Online Shopping System.
- 3. Requirement Analysis using Use Case Modeling**
Draw Use Case Diagrams and identify actors, use cases, and relationships for a selected software project.
- 4. Software Design using UML Diagrams**
Design UML diagrams such as Class Diagram, Sequence Diagram, Activity Diagram, and State Chart Diagram.
- 5. Designing Data Flow Diagrams (DFD) and ER Diagram**
Create Context Diagram, Level-0/Level-1 DFDs and ER diagram for a software application.
- 6. Agile Development Practice using User Stories and Scrum Artifacts**
Prepare product backlog, sprint backlog, user stories, and simulate sprint planning for a mini-project.
- 7. Software Architecture and Component Design**
Design modular architecture and class-based components for a selected application.
- 8. Web Application Interface Design Prototype**
Create wireframes or prototypes for a web application using tools such as Figma, Balsamiq, or any prototyping tool.
- 9. Mobile App Interface Design and Prototype Development**
Design screens and navigation flow for a mobile application following mobile UI/UX best practices.
- 10. Mini Project: Software Engineering Case Study Implementation**
Perform complete software engineering activities (problem definition, requirements, design models, prototype, testing plan, documentation) for a small project.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Major Theory

Course Title: Programming in VB

Course Code: SCITCT1302

Credits: 03

Max. Marks: 75 [CA:30 & ESA:45]

Lectures: 45Hrs.

Course / Learning Objectives:

1. To learn Graphical User Interface Language.
2. To develop an application using GUI Language.
3. Implement VB programs to solve simple problems

Course Outcomes:

After successful completion of this course, students will be able to:

1. Understand the fundamentals of Visual Basic programming, the IDE environment, event-driven programming, and user interface design concepts.
2. Apply variables, constants, data types, operators, arrays, procedures, and control structures to develop Visual Basic programs.
3. Design and develop applications using decision-making, looping constructs, and modular programming techniques in Visual Basic.
4. Create and manage different types of forms, menus, and MDI applications using form properties and design tools.
5. Develop GUI-based applications using ActiveX controls such as command buttons, text boxes, list boxes, combo boxes, labels, picture boxes, option buttons, and check boxes.
6. Use Visual Data Manager for basic database handling and data-driven application development.
7. Analyze problems and develop event-driven desktop applications using Visual Basic programming techniques.
8. Demonstrate practical skills in designing, coding, debugging, and testing simple Windows-based applications.

Unit No.	Title of Unit & Contents	Hrs.
I	Getting Started with VB	10
	The IDE, The Elements of user interface, designing user interface, Programming an Application Visual Development and Event Driven Programming.	
II	Visual Basic The language	15
	Variable, Constants, data types, operators, arrays, collections, Procedures, control flow & loop statements - If-else, Nested If else, select case, do loop, for loop, nested for loop	
III	Working with forms	10

Unit No.	Title of Unit & Contents	Hrs.
	Form types, Appearance of forms, Form properties, designing menu structure, Introduction to MDI forms.	
IV	Basic Active X controls	10
	Command button control-properties, Text Box control- properties, List Box & Combo Box control properties, label control-properties, picture box control properties, Option button and check box control properties, Understanding Visual data manager.	

Learning Resources:

1. Mastering Visual Basic 6 by Evangelos Perroustos (BPB Publications)
2. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill
3. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Major Practical

Course Title: Lab Course VB

Course Code: SCITCP1302

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60Hrs.

This is suggestive practical list for VB code laboratory.

1. Write a program to solve a general quadratic equation $ax^2 + bx + c = 0$.
2. Create a solution to display the following series:-
 - a) 1, 3, 5, 7.....15
 - b) 0.2, 0.4, 0.6.....2.0
3. Write a program to display the square and cube of the numbers from 1 to 100 using
 - i) For-next loop
 - ii) While-wend loop
 - iii) Do while loop
4. Write a program to find out factorial of a number.
5. Write a program to check whether the entered number is Armstrong or not.
6. Write a program on VB to check the number is even or odd.
7. Write a program on VB to check the number is prime or not.
8. Write a program on VB on summation of given number.
9. Write a program on Arithmetic operations.
10. Write a program to print the Fibonacci Series within a given range.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Major Theory

Course Title: IKS in IT

Course Code: SCITIKS1301

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 30 Hrs.

Learning Objectives:

1. To understand: Analyze foundational concepts & contributions of Indian Mathematics, Machine Learning.
2. To implement mathematical principles in solving machine learning problems.
3. To assess the integration of Indian mathematical techniques into modern machine learning models.
4. To develop innovative machine learning algorithms inspired by Indian Mathematics.

Course Outcomes:

After completion of the course, the student will be able to-

1. Gain in-depth knowledge of Indian Mathematics and its relevance in modern computational techniques.
2. Develop the ability to apply mathematical foundations to design and optimize machine learning models.
3. Evaluate and analyze real-world applications and future trends of AI in the Indian context..

Unit No.	Title of Unit & Contents	Hrs.
I	Foundation of Indian Mathematics	08
	Vedic Mathematics: Speed Mathematics Techniques, Contributions of Aryabhata, Brahmagupta, and Bhaskara II, Concepts of Zero and Infinity in Indian Mathematics, Ancient Algebra and Geometry: Sulba Sutras and their Applications,	
II	Ancient of AI	08
	Artificial Neural Networks: Concepts and Applications, Support Vector Machines (SVMs) and Kernel Methods, Ensemble Methods: Random Forests, Bagging, and Boosting,	
III	Machine Learning	08
	Optimization Techniques in Machine Learning: Gradient Descent, Handling Large Datasets: Scalability and Big Data Integration	
IV	Neural Network	06
	Artificial Neural Networks: Concepts and Applications, Support Vector Machines (SVMs) and Kernel Methods,	

Reference Books:

1. The Great Indian Mathematicians: 15 Pioneers Who Put Indian Mathematics on the World Map by Gaurav Tekriwal.
2. Mathematics in India by Kim Plofker
3. Vedic Mathematics Made Easy by Dhaval Bathia.
4. Introduction to Machine Learning with Python by Andreas C. Müller and Sarah Guido
5. Machine Learning: A Probabilistic Perspective by Kevin P. Murphy
6. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Major Elective Theory

Course Title: Programming in PHP

Course Code: SCITET1301

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 30 Hrs.

Course / Learning Objectives:

Students will be able to:

1. Learn Core-PHP, Server-Side Scripting Language.
2. Learn to design dynamic and interactive Web pages.
3. Learn PHP-Database handling.

Course Outcomes:

After completion of the course, the student will be able to-

1. Able to design dynamic and interactive web pages, websites.
2. Able to run PHP scripts on server and retrieve results.
3. Able to handle databases like MySQL using PHP in web sites.

Unit No.	Title of Unit & Contents	Hrs.
I	Introduction to PHP	10
	Introduction to PHP, History and Features of PHP, Installation & Configuration of PHP, Embedding PHP code in Your Web Pages, Understanding PHP, HTML, and White Space. Writing Comments in PHP, Sending Data to the Web Browser, Data types in PHP, Keywords in PHP, Using Variables, Constants in PHP, Expressions in PHP, Operators in PHP.	
II	Programming with PHP	10
	Conditional statements: if, if-else, switch, The? Operator, looping statements: while Loop, do...while Loop, for Loop, Arrays in PHP: Introduction- What is Array? Types of Arrays: Indexed Vs. Associative arrays, Multidimensional arrays, Creating Array, Accessing Array, Manipulating Arrays, Displaying arrays.... use of for. each as loop, Using Array Functions, Including and Requiring Files- use of Include () and Require (), Implicit and Explicit Casting in PHP	
III	Using Functions	05
	Functions in PHP: Defining and calling a function, Returning Value from function, Date and Time in PHP: Date and Time Functions, Strings in PHP: String Functions	
IV	Class and Object	05
	Objects in PHP: What is Class & Object, Creating and accessing a Class &	

Unit No.	Title of Unit & Contents	Hrs.
	Object, Object properties, object methods, Overloading, inheritance, Constructor and Destructor	

Learning Resources:

1. PHP: The Complete Reference by Steven Holzner
2. Programming PHP by Kevin Tatroe, Peter MacIntyre



Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology
B.Sc. Third Year (Semester V)
Subject: Information Technology

Course Type: Major Elective Practical

Course Title: Lab Course E1-PHP

Course Code: SCITEP1301

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60Hrs.

This is suggestive practical list for PHP laboratory.

1. Write a program in PHP to demonstrate looping statements in PHP.
2. Write a program in PHP to demonstrate conditional statements in PHP.
3. Write a program in PHP to Create an Array, Insert elements in Array,
4. Accessing Elements from Array and Displaying elements of Arrays.
5. Write a program in PHP to demonstrate including multiple files in PHP webpage.
6. Write a program in PHP to Creating and Calling Your Own Functions.
7. Write a program in PHP to declare a class, creating an Object, demonstrates
8. Writing Methods & Declaring Properties, Accessing Objects.
9. Write a program in PHP to demonstrate String Functions.
10. Write a program in PHP to demonstrate Date and Time Functions.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Vocational & Skill Enhancement Course

Course Title: System Security

Course Code: SCITVC1301

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60Hrs.

Learning Objectives:

1. Fundamental issues and first principles of security and information assurance.
2. Security policies, models and mechanisms related to confidentiality, integrity, authentication, identification, and availability issues
3. It related to information and information systems.

Course Outcomes:

After completion of the course, the student will be able to –

1. Expected to possess in-depth knowledge of formal modelling techniques for secure computer systems
2. Advanced knowledge of common vulnerabilities, attack mechanisms, and methods against computer and information systems

Unit No.	Title of Unit & Contents	Hrs.
I	Security Basics	15
	General overview and definitions, Security models and policy issues	
II	Basic Cryptography and Network security	15
	Introduction to cryptography and classical cryptosystem, Authentication protocols and Key Management, IPSec, VPNs, E-commerce issues.	
III	Systems Design Issues	15
	Design principles, Security Mechanisms, Auditing Systems	
IV	Information assurance	15
	Risk analysis, System verification and evaluation	

Reference Books:

1. Security in Computing, 2nd Edition, Charles P. Pfleeger, Prentice Hall
2. Building Secure Software: How to avoid the Security Problems the Right Way, John Viega, Gary McGraw, Addison-Wesley, 2002



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester V)

Subject: Information Technology

Course Type: Field Project / Project / Case Study etc.

Course Title: Project in IT

Course Code: SCITFP1301

Credits: 04

Max. Marks: 100 [CA:40 & ESA:60]

Lectures: 120Hrs.

Course / Learning Objectives:

After successful completion of this course, students will be able to:

1. Identify and analyze real-world problems in Information Technology and formulate appropriate software-based solutions.
2. Apply knowledge of programming, databases, networking, web technologies, and software engineering to design and develop an IT project.
3. Develop skills in project planning, requirement analysis, implementation, testing, documentation, and deployment.
4. Enhance teamwork, communication, project management, and professional ethics through collaborative project work.
5. Prepare technical reports and effectively present project outcomes using appropriate documentation and presentation techniques.

Course Outcomes:

After completing this course, students will be able to:

CO1: Identify, analyze, and define the requirements of a real-world IT problem and propose an appropriate solution.

CO2: Design, develop, test, and implement a software application using suitable tools, technologies, and programming practices.

CO3: Apply software engineering principles, project management techniques, and quality assurance methods during project development.

CO4: Prepare comprehensive technical documentation and demonstrate effective communication through project presentations and viva-voce.

CO5: Work effectively as an individual or as a member of a team while adhering to professional ethics and lifelong learning practices.

	General Guidelines for Project in Information Technology	
I	General Guidelines:	
	1. The project may be undertaken individually or in a group of not more than three students. 2. The project topic should be relevant to the field of Information Technology and preferably address a real-life problem or industrial, academic, social, or business requirement. 3. The project shall be carried out under the guidance of a faculty supervisor approved by the department. Industry co-guidance may be permitted wherever applicable.	
II	Students should prepare a Project Proposal containing:	
	1. Title of the Project 2. Problem Statement 3. Objectives 4. Scope 5. Methodology 6. Tools and Technologies 7. Expected Outcomes 8. Tentative Work Plan	
III	The project should include appropriate stages such as:	
	1. Requirement Analysis 2. System Design 3. Database Design (if applicable) 4. Coding and Implementation 5. Testing and Debugging 6. Deployment (where applicable) 7. Documentation	
IV	Students should maintain a Project Diary/Log Book recording weekly progress, meetings with the guide, and work completed.	
V	The project report should be prepared in a standard format and normally include:	
	1. Cover Page / Title Page 2. Certificate 3. Declaration 4. Acknowledgement 5. Abstract 6. Table of Contents 7. List of Figures/Tables 8. Introduction 9. Literature Review 10. System Analysis 11. System Design 12. Implementation 13. Testing 14. Results and Discussion	

	General Guidelines for Project in Information Technology	
	15. Conclusion and Future Scope 16. References 17. Appendices (if any)	
VI	At the end of the semester, students shall submit:	
	1. Project Report (Hard Copy and Soft Copy) 2. Source Code 3. Database Scripts (if applicable) 4. User Manual 5. Presentation Slides 6. Students must demonstrate the working of the project during the Project Demonstration and Viva-Voce Examination.	
VII	Evaluation Scheme (100 Marks)	
	➤ Continuous Assessment – 40 Marks ➤ Final Evaluation – 60 Marks • Demonstration / results: 25 marks • Project report: 15 marks • Presentation: 10 marks • Viva Voce: 10 marks	

Semester VI



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Theory

Course Title: Software Testing

Course Code: SCITCT1351

Credits: 03

Max. Marks: 75 [CA:30 & ESA:45]

Lectures: 45 Hrs.

Course / Learning Objectives:

After completing this course, students will be able to:

1. Understand the fundamental concepts of software quality assurance, software reliability, and quality standards in software development.
2. Learn various software testing strategies, methodologies, and testing techniques used for conventional software applications.
3. Apply white-box, black-box, validation, and system testing methods to detect defects and improve software quality.
4. Analyze testing processes and guidelines for web applications and mobile applications using appropriate testing approaches.
5. Develop practical skills in test case design, defect identification, bug reporting, and use of software testing tools.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Understand software quality assurance principles, software reliability concepts, quality standards, and software testing strategies.
2. Apply different software testing techniques including white-box, black-box, validation, system testing, and basis path testing for conventional applications.
3. Analyze and perform testing processes for web applications and mobile applications using appropriate testing guidelines and strategies.
4. Develop test cases, execute testing procedures, identify defects, and use testing tools for ensuring software quality and reliability.

Unit No.	Title of Unit & Contents	Hrs.
I	Software Quality Assurance	10
	Software Quality, Formal Technical Reviews, Elements of Software Quality Assurance, SQA Tasks, Goals, and Metrics, The ISO 9000 Quality Standards.	
II	Software Testing Strategies	15
	A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Test Strategies for Web Apps, Validation Testing, System	

Unit No.	Title of Unit & Contents	Hrs.
	Testing,	
III	Testing Conventional Applications	10
	Software Testing Fundamentals, Internal and External Views of Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing,	
IV	Testing Web Applications & Mobile Applications	10
	Testing Concepts for WebApps, The Web Testing Process An Overview, Testing Guidelines for Mobile Apps, The Testing Strategies of mobile apps,	

Learning Resources:

1. Software Engineering A Practitioner's Approach (eighth edition) By Roger S. Pressman (McGraw Hill Pub.)
2. The Art of Software Testing, 3rd Edition Author: Glenford J. Myers, Corey Sandler, Tom Baggett. The First Edition



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Practical

Course Title: Lab Course ST

Course Code: SCITCP1351

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60 Hrs.

Suggested Practical List for Software Testing Laboratory:

1. Study of Software Quality Assurance (SQA) Concepts
Prepare a report on SQA tasks, software quality factors, reliability, and ISO 9000 standards.
2. Preparation of Software Test Plan
Design a test plan for a sample application including objectives, scope, strategy, and test cases.
3. Design and Execution of Unit Testing
Perform unit testing on simple program modules and document test results.
4. White-Box Testing using Basis Path Testing
Construct flow graph, calculate cyclomatic complexity, and identify independent paths.
5. Black-Box Testing Techniques
Perform testing using equivalence partitioning and boundary value analysis.
6. Validation and System Testing
Design and execute validation tests and system tests for a selected software application.
7. Web Application Testing
Test a web application for functionality, usability, form validation, and link testing.
8. Mobile Application Testing
Perform basic testing of a mobile app covering UI testing, functionality testing, and compatibility testing.
9. Defect Reporting and Bug Tracking
Prepare bug reports and simulate defect tracking using testing templates or tools.
10. Testing Tool-Based Practical (Selenium / JUnit / Any Open Source Tool)
Perform automated or manual testing using a software testing tool.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Theory

Course Title: Programming in Java

Course Code: SCITCT1352

Credits: 03

Max. Marks: 75 [CA:30 & ESA:45]

Lectures: 45 Hrs.

Learning Objectives:

1. To write syntactically correct Java programs.
2. To implement control structures to manage program flow.
3. To design classes with constructors, methods, and overloading, applying OOP concepts.
4. To utilize inheritance and method overriding to create hierarchical class structures.
5. To organize code using packages and handle errors via exception handling.

Course Outcomes:

After completion of the course, the student will be able to –

1. Demonstrate the ability to set up a Java environment (JDK, IDE) and execute simple programs.
2. Construct programs using control structures for logical flow.
3. Apply OOP concepts (classes, objects, inheritance) to solve problems.
4. Create and manipulate data structures (arrays, strings) efficiently.
5. Design reusable code using packages and handle runtime errors with try-catch blocks.
6. Debug and optimize Java programs for correctness and readability.

Unit No.	Title of Unit & Contents	Hrs.
I	Introduction to Java	10
	Introduction to Object Oriented Programming, A Short History of Java, Features of Java, Difference between Java and C++, Java Virtual Machine (JVM), Java program structure, Java statement and Types of Comments, Keywords, Data Types, Variables, Constants and Operators, Output using println() method, Setting up Java Development Environment (JDK, IDE), Writing and executing simple Java programs	
II	Control Structures and Object Oriented Programming Concepts	15
	Decision making statements: Simple if statement, if...else statement, nesting of if...else Switch statement, Looping Statements: while statement, do-while statement, for statement. Introduction to Class: defining a class, adding variables, Adding Methods, Accessing Class Members. Constructors, Method Overloading. Inheritance: Extending a class, Method Overriding.	
III	Arrays, Strings & Packages	10
	Introduction, One-dimensional Arrays: Creating one dimensional array Two- dimensional Arrays: Creating two- dimensional array	

Unit No.	Title of Unit & Contents	Hrs.
	String Arrays, String Methods Java API package Using system packages Creating Packages: accessing a package, using a package, adding a class to a package.	
IV	Exception Handling and Applet Programming	10
	Dealing with errors, Catching exception and exception handling Create user defined exception. Applet Life Cycle, Applet HTML Tags, Passing parameters to Applet repaint() and update() method	

Learning Resources:

1. Programming with Java, A primer, Fourth edition, By E. Balagurusamy
2. Complete reference Java by Herbert Schildt (5th edition)
3. Java 2 programming black books by Steven Horlzner



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Practical

Course Title: Lab Course Java

Course Code: SCITCP1352

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60 Hrs.

This is suggestive practical list for code laboratory.

1. Introduction to Java & Environment Setup: Install JDK and IDE (e.g., IntelliJ/Eclipse).
2. Write a "Hello World" program using System.out.println().
3. Demonstrate Java keywords, data types, and variables (e.g., int, String).
4. 3 Control Structures: Implement decision-making and loops.
5. Use if-else to check even/odd numbers, Implement a switch-case for arithmetic operations (+, -, *, /),
6. Print patterns (e.g., pyramid) using for/while loops.
7. Add constructors (default, parameterized) to the Student class.
8. Implement method overloading (e.g., add(int a, int b) and add(double a, double b)).
9. Inheritance: Create a Parent class and a Child class inheriting from it (single inheritance),
10. Override a method (e.g., display()) in the child class.
11. Implement a multilevel inheritance hierarchy (e.g., Animal → Dog → Puppy).
12. Applet Programming: Create an applet to display "Hello Java" with paint().



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Theory

Course Title: E-Commerce

Course Code: SCITCT1353

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 30 Hrs.

Course / Learning Objectives:

After successful completion of this course, students will be able to:

1. Understand the fundamentals, concepts, scope and applications of E-Commerce.
2. Explain various E-Commerce business models and online business applications.
3. Analyze the basic process of developing and managing E-Commerce websites.
4. Understand security issues, threats and protective mechanisms in E-Commerce.
5. Describe electronic payment systems and emerging trends in E-Commerce.

Course Outcomes:

After completing this course, learners will be able to:

1. Define E-Commerce concepts, models and distinguish traditional commerce from electronic commerce.
2. Explain and apply different E-Commerce business models such as B2B, B2C, C2C and P2P in real-world contexts.
3. Demonstrate understanding of basic E-Commerce website development and online business operations.
4. Identify security threats in E-Commerce and explain appropriate security mechanisms and safe electronic transactions.
5. Analyze electronic payment systems and evaluate current trends and opportunities in E-Commerce.

Unit No.	Title of Unit & Contents	Hrs.
I	Introduction to E-Commerce	10
	Concept, Meaning and Scope of E-Commerce Traditional Commerce vs E-Commerce Features, Advantages and Limitations of E-Commerce Types of E-Commerce: B2B, B2C, C2C, P2P Applications of E-Commerce	
II	E-Commerce Business Models and Website Development	07
	B2C and B2B Business Models E-Commerce Applications: E-Banking, E-Trading, E-Auction Introduction to E-Commerce Website Development Planning and Development of E-Commerce Websites Web Hosting and Maintenance Basics	
III	Security in E-Commerce	07
	Security Issues in E-Commerce	

Unit No.	Title of Unit & Contents	Hrs.
	Security Threats: Hacking, Spoofing, Fraud, DoS Attacks Encryption and Secure Communication SSL, Firewalls and Proxy Servers Basics of Cyber Security in E-Commerce	
IV	Electronic Payment Systems and E-Commerce in India	06
	Electronic Payment Systems: Digital Wallets, Digital Cash Credit/Debit Card Payment Systems Digital Cheque and Payment Gateways Mobile Payments and Online Transactions Overview of E-Commerce in India and Emerging Trends	

Learning Resources:

1. Electronic Commerce by Turban, E., King, D., Lee, J., & Viehland, D. Pearson.
2. E-Commerce: Business by Technology, Society, Laudon, K. C., & Traver, C. G. Pearson.
3. Electronic Commerce by Schneider, G. P. Cengage Learning.
4. Frontiers of Electronic Commerce by Kalakota, R., & Whinston, A. B. Addison Wesley.
5. Electronic Commerce: From Vision to Fulfillment by Awad, E. M. Pearson.
6. Security in Computing, Pfleeger, C.
7. Electronic Payment Systems, O'Mahony, D.
8. RBI Digital Payments Reports (e-resources)

E-Resources

- NPTEL E-Commerce Course
- SWAYAM Modules
- e-PG Pathshala
- National Digital Library of India (NDLI)



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Elective Theory

Course Title: Programming in Python

Course Code: SCITET1351

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 30 Hrs.

Learning Objectives:

1. To acquire programming skills in core Python
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

Course Outcomes:

After completion of the course, the student will be able to-

1. Upon successful completion of this course, student will be able to
2. Explain basic principles of Python programming language
3. Implement object-oriented concepts
4. Implement database and GUI applications

Unit No.	Title of Unit & Contents	Hrs.
I	Introduction	08
	Introduction to Python, Features of python, What Can I Do with Python? Python Interpreter, Data types, Variables, Comments, Operators, expressions; input, processing and output statements, Control Structures: loops and decision	
II	String Handling, Classes, Modules and Package	08
	Strings, String operations and String Slicing, Defining Classes, Defining and calling functions passing arguments to functions, Python and OOP – Inheritance, polymorphism, Modules – datetime, math, Packages	
III	Exception Handling and Collections	06
	Exception in python, Exception roles, Exception Handling, Collections in Python – List, Tuples, Dictionaries, Sets	
IV	GUI Programming and Database Connectivity Using Python	08
	Graphical User Interfaces, Using the tkinter Module, Creating Label, Text, Button, info Dialog Boxes, Radiobutton, Checkbutton, Getting Input, Importing MySQL for Python, Connecting with a database, Forming a query in MySQL, Passing a query to MySQL.	

Reference Books:

1. Mark Lutz, Learning Python, 5th Ed. O'REILLY
2. Tony Gaddis, STARTING OUT WITH Python, Addison-Wesley

3. John Paul Mueller, Beginning Programming with Python For Dummies
4. Albert Lukaszewski, MySQL for Python, Packet Publishing



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Major Elective Practical

Course Title: Lab Course E2-Python

Course Code: SCITEP1351

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60Hrs.

Suggested Laboratory Outcome

After completion of the laboratory, students will be able to:

- Develop and execute Python programs using fundamental constructs.
- Implement data structures, file handling and OOP concepts.
- Use Python libraries for basic data analysis and visualization.
- Build simple real-world applications using Python.

This is suggestive practical list for Python code laboratory.

1. Program to demonstrate different data types.
2. Program to demonstrate decision making statement.
3. Program to demonstrate Looping statement.
4. Program to demonstrate different string methods.
5. Program to demonstrate function declaration and passing arguments.
6. Program to demonstrate inheritance and its Types.
7. Program to demonstrate polymorphism.
8. Program to demonstrate exception handling.
9. Program to demonstrate different collections.
10. Program to demonstrate database connectivity.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: Vocational & Skill Enhancement Course

Course Title: Digital Media

Course Code: SCITVC1351

Credits: 02

Max. Marks: 50 [CA:20 & ESA:30]

Lectures: 60 Hrs.

Course / Learning Objectives:

After completing this course, students will be able to:

1. Understand the fundamentals, tools, and applications of digital media.
2. Learn principles of digital content creation using text, graphics, audio, video, and animation.
3. Apply multimedia design and editing techniques using digital media tools.
4. Develop practical skills for digital publishing, social media content creation, and media communication.
5. Analyze ethical, legal, and professional issues related to digital media usage.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain concepts, components, and applications of digital media and multimedia technologies.
2. Apply digital media tools and techniques to create and edit multimedia content.
3. Develop digital content for web, social media, and communication platforms using design principles.
4. Analyze ethical, legal, and emerging technological aspects of digital media applications.
5. Demonstrate practical skills in digital content production, publishing, and media communication.

Unit No.	Title of Unit & Contents	Hrs.
I	Introduction to Digital Media	15
	Fundamentals of Digital Media Evolution and Scope of Digital Media Types of Digital Media: Text, Image, Audio, Video, Animation Digital Media Platforms and Applications Basics of Multimedia Systems Digital Communication and Media Convergence	
II	Digital Content Creation and Editing	15
	Principles of Graphic Design Image Editing Basics Audio Editing and Sound Processing Video Editing Fundamentals Animation Basics Storyboarding and Content Planning	

Unit No.	Title of Unit & Contents	Hrs.
	Introduction to Digital Media Tools	
III	Web and Social Media Content Development	15
	Digital Publishing Concepts Web Content Creation and Blogging Social Media Content Design Digital Marketing Basics Content Management Systems (CMS) Visual Communication and Branding Copyright and Ethical Issues in Digital Media	
IV	Emerging Trends and Applications in Digital Media	15
	Interactive Media and Digital Storytelling Mobile Media Applications Digital Photography and Videography Introduction to UI/UX in Media Design Basics of Motion Graphics Emerging Trends: AR, VR, AI in Media Career Opportunities in Digital Media	

Learning Resources:

Suggested E-Book References / Resources

1. Multimedia: Making It Work – Tay Vaughan
2. Digital Multimedia – Nigel Chapman
3. The Language of New Media – Lev Manovich
4. Multimedia Systems – Ralf Steinmetz
5. Digital Media Tools – Nigel French

Free E-Book / Online Resources

- NPTEL Multimedia Courses
- SWAYAM Digital Media Modules
- Adobe Education Resources
- Open Educational Resources in Multimedia
- Tutorials from Canva, GIMP, Audacity and OpenShot Documentation



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

B.Sc. Third Year (Semester VI)

Subject: Information Technology

Course Type: OJT

Course Title: On Job Training

Course Code: SCITOJT1351

Credits: 04

Max. Marks: 100 [CA:40 & ESA:60]

Lectures: 120Hrs.

Course / Learning Objectives:

After completing this course, students will be able to:

1. Gain practical exposure to real-world IT work environments through industry-based training.
2. Apply theoretical knowledge of computer science and information technology to solve practical problems.
3. Develop technical skills in software development, networking, databases, cybersecurity, web technologies, cloud computing, or other relevant IT domains.
4. Enhance professional competencies such as communication, teamwork, leadership, ethics, and workplace discipline.
5. Understand software development life cycle (SDLC), project management practices, and industry standards.
6. Improve analytical thinking, problem-solving, and decision-making abilities in professional IT settings.
7. Prepare technical documentation, reports, presentations, and maintain work records according to organizational standards.
8. Build industry readiness by understanding workplace culture, emerging technologies, and career opportunities in the IT sector.

Course Outcomes:

After successful completion of the On-Job Training, students will be able to:

CO1: Apply academic knowledge and technical skills to perform assigned tasks effectively in a professional IT environment.

CO2: Demonstrate proficiency in using modern IT tools, software, programming languages, frameworks, and technologies relevant to the assigned project or organization.

CO3: Analyze real-world problems, develop appropriate IT-based solutions, and contribute effectively to project development and execution.

CO4: Exhibit professional ethics, effective communication, teamwork, time management, and organizational responsibility while working in an industry environment.

CO5: Prepare comprehensive technical documentation, internship reports, presentations, and demonstrate learning outcomes through project work and presentations.

CO6: Evaluate workplace practices, identify areas for continuous learning, and demonstrate readiness for employment or entrepreneurial opportunities in the IT industry.

	General Guidelines for OJT in Information Technology	
	Please refer following circular for General Guidelines: (Available on Swami Ramanand Teerth Marathwada University Nanded Website)	
	जा.क्र. शैक्षणिक ०१/ परिपत्रक / ओजेटी/ २०२४-२५/228 दिनांक : ०५.०८.२०२४	