

Dadasaheb Tirodkar Educational Academy's  
**PADMASHRI BABASAHEB VENGURLEKAR MAHAVIDYALAYA,**  
**PANDURTITHA**  
*(Affiliated to University of Mumbai)*

**BACHELOR OF INFORMATION TECHNOLOGY(B.Sc.I.T.)**

**Programme Objectives**

The objectives of the programme as cited by the University of Mumbai are as follows:

The main objectives of the course are:

- to think analytically, creatively and critically in developing robust, extensible and highly maintainable technological solutions to simple and complex problems.
- to apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.
- to be capable of managing complex IT projects with consideration of the human, financial and environmental factors.
- to work effectively as a part of a team to achieve a common stated goal.
- to adhere to the highest standards of ethics, including relevant industry and organizational codes of conduct.
- to communicate effectively with a range of audiences both technical and non-technical.
- to develop an aptitude to engage in continuing professional development.

**Programme Specific Outcomes of B.Sc.I.T**

**After Completing Bachelors of Information Technology(B.Sc.I.T) Students are able to:**

1. An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. An ability to function effectively on teams to accomplish a common goal
5. An understanding of professional, ethical, legal, security and social issues and responsibilities
6. An ability to communicate effectively with a range of audiences
7. An ability to analyze the local and global impact of computing on individuals, organizations, and society

8. Recognition of the need for and an ability to engage in continuing professional development
9. An ability to use current techniques, skills, and tools necessary for computing practice
10. An ability to use and apply current technical concepts and practices in the core information technologies
11. An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems
12. An ability to effectively integrate IT-based solutions into the user environment
13. An understanding of best practices and standards and their application
14. An ability to assist in the creation of an effective project plan

### **Bachelor Of Information Technology**

#### **Programme Objectives**

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- to apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.
- to be capable of managing complex IT projects with consideration of the human, financial and environmental factors.
- to work effectively as a part of a team to achieve a common stated goal.
- to adhere to the highest standards of ethics, including relevant industry and organizational codes of conduct.
- to communicate effectively with a range of audiences both technical and non-technical.
- to develop an aptitude to engage in continuing professional development.

**Department of Information Technology**

<b>CLASS</b>	<b>COURSE/ COURSE CODE</b>	<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
FYIT (SEM-I)	Imperative Programming	The objective of this course is to provide a comprehensive study of the C programming language, stressing upon the strengths of C, which provide the students with the means of writing modular, efficient, maintainable, and portable code.	<ul style="list-style-type: none"> <li>• Students should be able to write, compile and debug programs in C language.</li> <li>• Students should be able to use different data types in a computer program.</li> <li>• Students should be able to design programs involving decision structures, loops and functions.</li> <li>• Students should be able to explain the difference between call by value and call by reference</li> <li>• Students should be able to understand the dynamics of memory by the use of pointers.</li> <li>• Students should be able to use different data structures and create/update basic data files.</li> </ul>
	Digital Electronics	To understand the structure and operation of modern processors and their instruction sets	<ul style="list-style-type: none"> <li>• To learn about how computer systems work and underlying principles</li> <li>• To understand the basics of digital electronics needed for computers</li> <li>• To understand the basics of instruction set architecture for reduced and complex instruction sets</li> <li>• To understand the basics of processor structure and operation</li> <li>• To understand how data is transferred between the processor and I/O devices</li> </ul>
	Operating Systems	Learners must understand proper working of operating system. To provide a sound understanding of Computer operating system, its structures, functioning and algorithms.	<ul style="list-style-type: none"> <li>• To provide a understanding of operating system, its structures and functioning</li> <li>• Develop and master understanding of algorithms used by operating systems</li> <li>• for various purposes.</li> </ul>

	Discrete Mathematics	<p>The purpose of the course is to familiarize the prospective learners with mathematical structures that are fundamentally discrete. This course introduces sets and functions, forming and solving recurrence relations and different counting principles. These concepts are useful to study or describe objects or problems in computer algorithms and programming languages.</p>	<ul style="list-style-type: none"> <li>• To provide overview of theory of discrete objects, starting with relations and partially ordered sets.</li> <li>• Study about recurrence relations, generating function and operations on them.</li> <li>• Give an understanding of graphs and trees, which are widely used in software.</li> <li>• Provide basic knowledge about models of automata theory and the corresponding formal languages.</li> </ul>
	Communication Skills	<p>To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hidden strengths, capabilities and knowledge equip them to excel in real work environment and corporate life. Understand various issues in personal and profession communication and learn to overcome them</p>	<ul style="list-style-type: none"> <li>• To know about various aspects of soft skills and learn ways to develop personality</li> <li>• Understand the importance and type of communication in personal and professional environment.</li> <li>• To provide insight into much needed technical and non-technical qualities in career planning.</li> <li>• Learn about Leadership, team building, decision making and stress management</li> </ul>

CLASS	COURSE/ COURSE CODE	COURSE OBJECTIVES	COURSE OUTCOMES
FYIT (SEM- II)	Object oriented Programming	The objective of this course is to provide a comprehensive study of the C++ programming language, stressing upon the strengths of C++, which provide the students with the means of writing modular, efficient, maintainable, and portable code.	<ul style="list-style-type: none"> <li>• Students should be able to write, compile and debug programs in C++ language.</li> <li>• Students should be able to use different data types in a computer program.</li> <li>• Students should be able to design programs involving decision structures, loops and functions.</li> <li>• Students should be able to explain the difference between call by value and call by reference</li> <li>• Students should be able to understand the dynamics of memory by the use of pointers.</li> <li>• Students should be able to use different data structures and create/update basic data files.</li> </ul>
	Microprocessor Architecture	To understand the structure and operation of modern processors and their instruction sets	<ul style="list-style-type: none"> <li>• To learn about how computer systems work and underlying principles</li> <li>• To understand the basics of digital electronics needed for computers</li> <li>• To understand the basics of instruction set architecture for reduced and complex instruction sets</li> <li>• To understand the basics of processor structure and operation</li> <li>• To understand how data is transferred between the processor and I/O devices</li> </ul>
	Web Programming	To provide insight into emerging technologies to design and develop state of - the art web applications using client-side scripting, server-side scripting, and database connectivity.	<ul style="list-style-type: none"> <li>• To design valid, well-formed, scalable, and meaningful pages using emerging technologies.</li> <li>• Understand the various platforms, devices, display resolutions, viewports, and</li> </ul>

		<p>browsers that render websites</p> <ul style="list-style-type: none"> <li>• To develop and implement client-side and server-side scripting language programs.</li> <li>• To develop and implement Database Driven Websites.</li> <li>• Design and apply XML to create a markup language for data and document centric applications.</li> </ul>
Numerical and Statistical Methods	<p>The purpose of this course is to familiarize students with basics of Statistics. This will be essential for prospective researchers and professionals to know these basics.</p>	<ul style="list-style-type: none"> <li>• Enable learners to know descriptive statistical concepts</li> <li>• Enable study of probability concept required for Computer learners</li> </ul>
Green Computing	<p>To familiarize with the concept of Green Computing and Green IT infrastructure for making computing and information system environment sustainable. Encouraging optimized software and hardware designs for development of Green IT Storage, Communication and Services. To highlight useful approaches to embrace green IT initiatives</p>	<ul style="list-style-type: none"> <li>• Learn about green IT can be achieved in and by hardware, software, network communication and data center operations.</li> <li>• Understand the strategies, frameworks, processes and management of green IT</li> </ul>

CLASS	COURSE/ COURSE CODE	COURSE OBJECTIVES	COURSE OUTCOMES
SYIT (SEM- III)	Python Programming	<ul style="list-style-type: none"> <li>• The objective of this paper is to introduce various concepts of programming to the students using Python.</li> <li>• The objective of this paper is to explore the style of structured programming to give the idea to the students</li> <li>• how programming can be used for designing real-life applications by reading/writing to files, GUI programming,</li> <li>• interfacing database/networks and various other features.</li> </ul>	<ul style="list-style-type: none"> <li>• Students should be able to understand the concepts of programming before actually starting to write programs.</li> <li>• Students should be able to develop logic for Problem Solving.</li> <li>• Students should be made familiar about the basic constructs of programming such as data, operations, conditions, loops, function etc.</li> <li>• Students should be able to apply the problem solving skills using syntactically simple language i.e.</li> <li>• <b>Python (version: 3.X or higher)</b></li> <li>• Students should be able to understand how to read/write to files using python.</li> <li>• Students should be able to catch their own errors that happen during execution of programs.</li> <li>• Students should get an introduction to the concept of pattern matching.</li> <li>• Students should be made familiar with the concepts of GUI controls and designing GUI applications.</li> <li>• Students should be able to connect to the database to move the data to/from the application.</li> <li>• Students should know how to connect to computers, read from URL and send email.</li> </ul>

	Data Structures	To explore and understand the 2 concepts of Data Structures and its significance in programming. Provide and holistic approach to design, use and implement abstract data types. Understand the commonly used data structures and various forms of its implementation for different applications using Python.	<ul style="list-style-type: none"> <li>• Learn about Data structures, its types and significance in computing</li> <li>• Explore about Abstract Data types and its implementation</li> <li>• Ability to program various applications using different data structure in Python</li> </ul>
	Computer Networks	In this era of Information, its computation and its exchange techniques, Learner should be able to conceptualize and understand the framework and working of communication networks. And on completion, will be able to have a firm grip over this very important segment of Internet.	<ul style="list-style-type: none"> <li>• Learner will be able to understand the concepts of networking, which are known as important for them to be</li> <li>• <i>networking</i></li> <li>• <i>professionals</i></li> <li>• Useful to proceed with industrial requirements and International vendor certifications.</li> </ul>
	Database Management Systems	To develop understanding of concepts and techniques for data management and learn about widely used systems for implementation and usage.	<ul style="list-style-type: none"> <li>• Master concepts of stored procedure and triggers and its use.</li> <li>• Learn about using PL/SQL for data management</li> <li>• Understand concepts and implementations of transaction management and crash recovery</li> </ul>
	Applied Mathematics	The course is designed to have a grasp of important concepts of Applied Mathematics in a scientific way. It covers topics from as basic as definition of functions to partial derivatives of functions in a gradual and logical way. The learner is expected to solve as many examples as possible to get complete clarity and understanding of the topics covered.	<ul style="list-style-type: none"> <li>• Understanding of Mathematical concepts like limit, continuity, derivative, integration of functions.</li> <li>• Ability to appreciate real world applications which uses these concepts.</li> <li>• Skill to formulate a problem through Mathematical modeling and simulation.</li> </ul>



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SYIT (SEM- IV)	Core Java	The objective of this course is to teach the learner how to use Object Oriented paradigm to develop code and understand the concepts of Core Java and to cover-up with the pre-requisites of Core java.	<ul style="list-style-type: none"> <li>• Object oriented programming concepts using Java.</li> <li>• Knowledge of input, its processing and getting suitable output.</li> <li>• Understand, design, implement and evaluate classes and applets.</li> <li>• Knowledge and implementation of AWT package.</li> </ul>
	Introduction to Embedded Systems	Students completing this course will be well positioned to: <ol style="list-style-type: none"> <li>1. Discuss the major components that constitute an embedded system.</li> <li>2. Implement small programs to solve well-defined problems on an embedded platform.</li> <li>3. Develop familiarity with tools used to develop in an embedded environment.</li> </ol>	<ul style="list-style-type: none"> <li>• Understanding what is a microcontroller, microcomputer, embedded system.</li> <li>• Understand different components of a micro-controller and their interactions.</li> <li>• Become familiar with programming environment used to develop embedded systems</li> <li>• Understand key concepts of embedded systems like IO, timers, interrupts, interaction with peripheral devices</li> <li>• Learn debugging techniques for an embedded system</li> </ul>
	Computer Oriented Statistical Techniques	The purpose of this course is to familiarize students with basics of Statistics. This will be essential for prospective researchers and professionals to know these basics.	<ul style="list-style-type: none"> <li>• Enable learners to know descriptive statistical concepts</li> <li>• Enable study of probability concept required for Computer learners</li> </ul>
	Software Engineering	The main objective is to introduce to the students about the product that is to be engineered and the process that provides a framework for the engineering technology.	<ul style="list-style-type: none"> <li>• Students will demonstrate basic knowledge in software engineering.</li> <li>• Students will be able to plan, design, develop and validate</li> </ul>

		<p>1.To provide knowledge of software engineering discipline.</p> <p>2.To analyze risk in software design and quality.</p> <p>3.To introduce the concept of advance software methodology.</p>	<ul style="list-style-type: none"> <li>• te the software project.</li> <li>3.Students will be apply advance software methodology tocreate high quality WebApp s.</li> <li>• 4.Students will have an understanding of impact of sound</li> <li>• engineering principles.</li> </ul>
	Computer Graphics and Animation	<p>1 To equip students with the fundamental knowledge and basic technical competence in the field of computer graphics.</p> <p>2 To emphasize on implementation aspect of Computer Graphics Algorithms.</p> <p>3 To prepare the student for advance areas like Image Processing or Computer Vision or Virtual Reality and professional avenues in the field of Computer Graphics.</p>	<ul style="list-style-type: none"> <li>• Understand the basic concepts of Computer Graphics.</li> <li>• Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.</li> <li>• Apply geometric transformations, viewing and clipping on graphical objects.</li> <li>• Explore solid model representation techniques and projections.</li> <li>• Understand visible surface</li> <li>• detection techniques and illumination models</li> </ul>

CLASS	COURSE/ COURSE CODE	COURSE OBJECTIVES	COURSE OUTCOMES
TYIT (SEM- V)	Software Project Management	<p>1. To familiarize the students with the use of a structured methodology/approach for each and every unique project undertaken, including utilizing project management concepts, tools and techniques.</p> <p>2. To appraise the students with the project management life cycle and make them knowledgeable about the various phases from project initiation through closure.</p>	<ul style="list-style-type: none"> <li>• Apply selection criteria and select an appropriate project from different options.</li> <li>• Write work break down structure for a project and develop a schedule based onit.</li> <li>• Identify opportunities and threats to the project and decide an approach to deal with them strategically.</li> <li>• Use Earned value technique and determine &amp; predict status of the project.</li> <li>• Capture lessons learned during project phases and document them for future</li> </ul>

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Internet of Things	To learn about SoC architectures; Learn how Raspberry Pi. Learn to program Raspberry Pi. Implementation of internet of Things and Protocols.	<ul style="list-style-type: none"> <li>• Enable learners to understand System On Chip Architectures.</li> <li>• Introduction and preparing Raspberry Pi with hardware and installation.</li> <li>• Learn physical interfaces and electronics of Raspberry Pi and program them using practical's</li> <li>• Learn how to make consumer grade IoT safe and secure with proper use of protocols.</li> </ul>
Advanced Web Programming	To explore .NET technologies for designing and developing dynamic, interactive and responsive web applications.	<ul style="list-style-type: none"> <li>• Understand the .NET framework</li> <li>• Develop a proficiency in the C# programming language</li> <li>• Proficiently develop ASP.NET web applications using C#</li> <li>• Use ADO.NET for data persistence in a web application</li> </ul>
Artificial Intelligence	Artificial Intelligence (AI) and accompanying tools and techniques bring transformational changes in the world. Machines capability to match, and sometimes even surpass human capability, make AI a hot topic in Computer Science. This course aims to introduce the learner to this interesting area.	After completion of this course, learner should get a clear understanding of AI and different search algorithms used for solving problems. The learner should also get acquainted with different learning algorithms and models used in machine learning.
Linux System Administration	Demonstrate proficiency with the Linux command line interface, directory & file management techniques, file system organization, and tools commonly found on most Linux distributions. Effectively operate a Linux system inside of a network environment to integrate with existing service solutions. Demonstrate the ability to troubleshoot challenging technical problems typically encountered when	Learner will be able to develop Linux based systems and maintain. Learner will be able to install appropriate service on Linux server as per requirement. Learner will have proficiency in Linux server administration.

		operating and administering Linux systems.	
	Enterprise Java	Explore advanced topic of Java programming for solving problems.	<ul style="list-style-type: none"> <li>• Understand the concepts related to Java Technology</li> <li>• Explore and understand</li> <li>• use of Java Server Programming</li> </ul>

<b>CLASS</b>	<b>COURSE/ COURSE CODE</b>	<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
TYIT (SEM- VI)	Software Quality Assurance	I. Basic software debugging methods. II. White box and Black box testing methods III. Writing the testing plans IV. Different testing tools	<ul style="list-style-type: none"> <li>• Identify the reasons for bugs and analyze the principles in software testing to prevent and remove bugs.</li> <li>• Implement various test processes for quality improvement</li> <li>• Apply the software testing techniques in commercial environments</li> <li>• Provides practical knowledge of a variety of ways to test software and an understanding of some of the trade-offs between testing techniques.</li> <li>• Familiar with the open</li> <li>• source testing tools.</li> </ul>
	Security in Computing	To provide students with knowledge of basic concepts of computer security including network security and cryptography.	<ul style="list-style-type: none"> <li>• Understand the principles and practices of cryptographic techniques. Understand a variety of generic security threats and vulnerabilities, and identify&amp; analyze particular security problems for a given application. Understand various protocols for network security to protect against the threats in a network</li> </ul>

	<p>Business Intelligence</p>	<p>1. To introduce the concept of data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage.</p> <p>2. To enable students to effectively identify sources of data and process it for data mining</p> <p>3. To make students well versed in all data mining algorithms, methods of evaluation.</p> <p>4. To impart knowledge of tools used for data mining</p> <p>To provide knowledge on how to gather and analyze large sets of data to gain useful business understanding.</p>	<ul style="list-style-type: none"> <li>• Demonstrate an understanding of the importance of data mining and the principles of business</li> <li>• intelligence Organize and Prepare the data needed for data mining using pre preprocessing techniques</li> <li>• Perform exploratory analysis of the data to be used for mining.</li> <li>• Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.</li> <li>• Define and apply metrics to measure the performance of various data mining algorithms.</li> </ul>
	<p>Principles of Geographic Information Systems</p>	<p>It introduces participant to the fundamentals of GIS, GPS, data models, data sources, databases, cartography, introduction to Global Positioning Systems (GPS) and geospatial metadata.</p> <p>It prepares the candidate for the geospatial modeling and analysis.</p>	<ul style="list-style-type: none"> <li>• describe what GIS is; name the major GIS software available; know where to find more information;</li> <li>• explain the components and functionality of a GIS and the differences between GIS and other information systems;</li> <li>• understand the nature of geographic information and explain how it is stored in computer (including map projection) and the two types of GIS data structure;</li> <li>• conduct simple spatial analysis using GIS software;</li> <li>• design and complete a GIS project from start to finish (data capture, data storage and management, analysis, and presentation);</li> </ul>

	Enterprise Networking	In this era of Information, its computation and its exchange techniques, Learner should be able to conceptualize and understand the framework and working of communication networks. And on completion, will be able to have a firm grip over this very important segment of Internet.	<ul style="list-style-type: none"> <li>• Learner will be able to understand the concepts of networking, which are important for them to be</li> <li>• known as a 'networking professionals'</li> <li>• Useful to proceed with industrial requirements and International vendor certifications.</li> </ul>
	IT Service Management	The course is designed as an introduction and practical implementation of Information Technology Service Management (ITSM) and enables the students to understand how an integrated ITSM framework can be utilized to achieve IT business integration, cost reductions and increased productivity.	<ul style="list-style-type: none"> <li>• Ability to identify IT services as a means to provide functionality and value to customers in the context of specific case studies.</li> <li>• Ability to understand the needs and targets of the different stakeholders (service providers, customers, suppliers/partners) in the services value chain.</li> <li>• Ability to understand the value of a service management framework as a means to help consultants and firms to establish a common understanding to ground a service management approach.</li> <li>• Ability to understand the service management processes</li> <li>• Ability to specify the service management system for given customers</li> <li>• Ability to select the appropriate tools to support a given designed service management solution</li> </ul>

	Cyber Laws	<ol style="list-style-type: none"><li>1. To understand and identify different types cybercrime and cyber law</li><li>2. To recognized Indian IT Act 2008 and its latest amendments</li><li>3. To learn various types of security standards compliances</li></ol>	<ul style="list-style-type: none"><li>• Understand the concept of cybercrime and its effect on outside world</li><li>• Interpret and apply IT law in various legal issues</li><li>• Distinguish different aspects of cyber law</li><li>• Apply Information Security Standards compliance during software</li><li>• design and development</li></ul>
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