



Thakur Educational Trust's (Regd.)

**THAKUR RAMNARAYAN
COLLEGE OF ARTS & COMMERCE**

NAAC Accredited & ISO 21001:2018 Certified



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Outcomes Based Education (OBE) Document

Programme: B.Sc. (I.T.)

F.Y.B.Sc.(I.T.)

Program Educational Objectives

PEO 1: To prepare students for career in Information Technology and its applications such as the design, development, implementation, testing and maintenance of computer software/hardware in professional career.

PEO 2: To develop the skill sets of students to be at par with the advancements in Information Technology domain.

PEO 3: To prepare the student for entry into a program of postgraduate study in Information Technology and related domain/ fields.

Program Outcomes

On successful completion, graduates of B.Sc. (I.T.) programme will be able to:

PO 1: Disciplinary Knowledge: Apply the knowledge of mathematics, computer science and Information Technology fundamentals to find of solutions of real time problems with different applications.

PO 2: Effective Communication Skills: Communicate effectively on complex activities with the end users and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 3: Critical thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, testing out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO 4: Problem Solving: Identify, formulate, research literature, and analyse various research and real time application scenarios reaching substantiated conclusions using first principles of mathematics, computer sciences, and information technology.

PO 5: Analytical Reasoning: Develop ability to analyse a problem, identify and define applications that resolves the end user requirement with respect to real time problems with appropriate consideration for the societal, and environmental considerations.

PO 6: Research Related Skills: Use research-based knowledge and research methods to investigate the problems that cannot be solved by straightforward application of knowledge, theories and techniques; that may not have a unique solution, which need to be defined (modelled) within appropriate mathematical framework/ scientific derivation/ global technological evolutions.

PO 7: Environment and Sustainability: Understand the impact of the scientific applications and solutions in societal and environmental contexts, and demonstrate the knowledge of green computing and need for sustainable development.

PO 8: Cooperation/ Teamwork: Function effectively as an individual, and as a member or team leader in diverse cross functional groups and in multidisciplinary settings.

PO 9: Information/Digital Literacy: Create, select, and apply appropriate techniques, resources, and modern tools including prediction and modelling to complex activities with an understanding of the limitations.

PO 10: Ethics: Apply ethical principles and commit to professional ethics & responsibilities and norms of the technological and sustainable development.

PO 11: Self-directed and Life-long Learning: Recognize the need for and have the preparation and ability to engage independent and lifelong learning in the broadest context of global technological evolution.

PO 12: Leadership Readiness/Qualities: Demonstrate knowledge and understanding of the Computer Science, Information Technology and management principles and apply these to one's own work, as a member and leader in a team, to manage research and application projects and in multidisciplinary environments.

Program Specific Outcomes

On successful completion, graduates of B.Sc. (I.T.) programme will be able to:

PSO 1: Demonstrate technical knowledge and illustrate the required skills for software development with the help of basic hardware components. Apply standard software engineering practices and strategies in the development using open-source programming environment.

PSO 2: Develop the skills of logical thinking, analytical thinking & acquire essential skills of both verbal as well as non-verbal communication.

PSO 3: Apply concepts of wired, wireless, embedded and IoT systems for demonstrating innovative solutions with consideration to real-time applications. Develop knowledge of basic concepts of computer network, security and software testing.

PSO 4: Acquaint with contemporary issues, latest trends in technological evolution and there by develop new ideas and design new solutions to existing problem.

MJ - Programming With C (101111)**Course Outcomes**

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Students can build flowcharts, pseudocode for C programs.			✓			
OC2	Students can use C language syntax and semantics in their programs.			✓			
OC3	Students can implement loops and decision making.			✓			
OC4	Students can use different types of data structures in their programs.			✓			
OC5	Students can write well-structured, readable, and maintainable C code and debug programs if there are any errors.					✓	

MJ - Database Management Systems (1011112)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Define and describe the fundamental elements of relational database management system.	✓					
OC2	To relate the basic concepts of relational data model, entity-relationship model, relational database		✓				
OC3	Design ER-models to represent simple database application scenarios.						✓
OC4	Understand the normalization and its role in the database design process		✓				
OC5	Transform the ER-model to relational tables, populate relational database and formulate SQL			✓			
OC6	Understand basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.		✓				

F.Y.B.Sc. (I.T.) (Semester - I)

Major - Practical 1 (P1-PWC, DBMS) (1011113)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Students can demonstrate the concepts of datatypes, variables and operators in C.		✓				
OC2	Students can implement the concept of control statements and looping in C program.			✓			
OC3	Students can demonstrate the use of arrays, strings and structures in C		✓				
OC4	Students can implement modular C program using functions and pointers.			✓			
OC5	Students can demonstrate the use of arrays, strings and structures in C.		✓				
OC6	Students able to perform various operations such as insert, update delete and retrieve data from database using SQL queries.			✓			
OC7	Students able to perform alteration in tables and can restore and take backup of the database.			✓			
OC8	Students able to perform operations using simple SQL Queries to fetch data and learns various aggregate functions to get single value.			✓			
OC9	Students able to perform SQL Queries using JOIN keyword for joining two or more tables.			✓			
OC10	Students able to perform nested queries using in, exists operators.			✓			
OC11	Students able to create new table by joining one or more tables and learn how						✓

	to hide attribute from end user.						
OC12	Students able to restrict the user from accessing data in database.			✓			
OC13	Students should be able to create, manipulate the database management system to evaluate the business information problem.					✓	

F.Y.B.Sc. (I.T.) (Semester - I)

VSC - Combinational & Sequential Design (1011411)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Students can explain the differences between combinational and sequential circuits, and identify their different applications.		✓				
OC2	Students can define the concept of Boolean algebra and its importance in digital circuit design.	✓					
OC3	Students can explain and apply the principles of K-map simplification and other design techniques.			✓			
OC4	Students can design and construct combinational circuits using Boolean algebra and K-maps.						✓
OC5	Students can design and implement arithmetic circuits such as adders, subtractors, and multipliers.						✓
OC6	Students can design and implement data path circuits such as registers, multiplexers, and decoders.						✓
OC7	Students can implement digital circuits using breadboards, logic probes, and oscilloscopes.			✓			
OC8	Students can troubleshoot and verify the correctness of digital circuits using real-world hardware and measure their performance using various metrics.					✓	

F.Y.B.Sc. (I.T.) (Semester - I)

SEC - Office Tools for Data Management (1011412)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Participants can explain normalization importance, identify table relationships, and justify database design choices.					✓	
OC2	Participants create well-structured MS Access databases with proper relationships, data types, and normalization.						✓
OC3	Participants execute advanced queries in MS Access, retrieving specific information based on diverse criteria.			✓			
OC4	Participants design intuitive MS Access forms, incorporating controls for an efficient and user-friendly data entry experience.						✓
OC5	Participants produce insightful MS Access reports, organizing and presenting data effectively for analysis.						✓

F.Y.B.Sc. (I.T.) (Semester - I)

OE - Modern Indian Drama (1461318)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	As a dynamic amalgamation of ancient heritage and global perspectives, modern Indian theater explores diverse narratives, reflecting the complex socio-cultural landscape of India.				✓		
OC2	This synthesis of traditions continues to evolve, contributing to the vibrant tapestry of India's theatrical expression.					✓	

F.Y.B.Sc. (I.T.) (Semester - I)
OE - Stress Management (1331311)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Students are able to find and explain various concepts of stress.		✓				
OC2	Students can explain the role of psycho physiology plays in stress, illness and disease. Students can give example and site researches for the same.			✓			
OC3	Students can compare different types of stressors and contrast to them to different kind of situations.				✓		
OC4	Students can explain Intrapersonal and interpersonal Interventions to manage stress.		✓				

F.Y.B.Sc. (I.T.) (Semester - I)
OE - Quantitative Techniques (1051311)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
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.		✓				

F.Y.B.Sc. (I.T.) (Semester - I)

AEC - Introduction to Communication Skills I (2511511)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Demonstrate an understanding of essential aspects of communication skills		✓				
OC2	Exhibit the ability to Read a variety of written text using subskills such as skimming and scanning.			✓			
OC3	Identify and rectify common grammatical errors in English.			✓			
OC4	Show competence in delivering compelling presentations and engage in articulate and effective conversations in English across different contexts.			✓			
OC5	Display advanced formal writing skills in crafting job application letters, CVs, and Statements of Purpose.						✓

F.Y.B.Sc. (I.T.) (Semester - I)

VEC - Law related to Intellectual Property Rights (2541513)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learners will understand the concept of IPR and analyze the concept of liabilities.				✓		
OC2	Learners will be able acquire the knowledge of the fundamentals of Intellectual property right and judicial perspective towards persons and properties		✓				
OC3	Learners will be able to evaluate the process of IPR mechanism set by the government.					✓	

F.Y.B.Sc. (I.T.) (Semester - I)
VEC - Indian Constitution (2541511)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learners will be empowered to understand the basic structure, nature of Indian Constitution		✓				
OC2	Learners will understand their and other citizens fundamental rights and duties towards the nation.		✓				
OC3	Learners will be equipped with the role of Indian Judiciary in protecting Fundamental Rights of citizens and will be able to describe areas of criminal justice, law and society through a critical analysis of the subject.				✓		

F.Y.B.Sc. (I.T.) (Semester - I)
IKS - Indian Knowledge System (2531511)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learner will understand and appreciate the rich Indian Knowledge Tradition		✓				
OC2	Learner will understand the contribution of Indians in various fields		✓				
OC3	Learner will experience increase subject-awareness and self-esteem		✓				
OC4	Learner will develop a comprehensive understanding of how all knowledge is ultimately intertwined		✓				

F.Y.B.Sc. (I.T.) (Semester - I)

CC- Introduction to Cultural Activities (2521611)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learner will understand the significance of cultural activities		✓				
OC2	Learner will develop sensitivity towards Indian culture and its preservation		✓				
OC3	Learner will be apply the knowledge and skills of the cultural activities in their practical life			✓			
OC4	Learner will participate in the various cultural activities			✓			

F.Y.B.Sc. (I.T.) (Semester - I)

**CC- Introduction to Sports, Physical Literacy, Health and Fitness and
Yog (2521615)**

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	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						✓
OC2	The curriculum would enable to officiate, supervise various sports events and organize sports events.			✓			
OC3	Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.		✓				
OC4	The student learns to plan, organize and execute sports events.						✓
OC5	Student will learn theoretical and practical aspects of game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.			✓			
OC6	Student acquires the knowledge of opted games, sports and yoga and also learns the technical and tactical experience of it.		✓				
OC7	Student will learn to apply knowledge of Physical fitness and exercise management to lead better quality life.			✓			
OC8	Students will understand and learn different dimension of active life style.		✓				
OC9	Student will learn the knowledge of		✓				

	nutrition and diet.						
OC10	Students will be able to assess the physical fitness in a scientific way.			✓			
OC11	The students will be able to continue professional courses and research in Physical Education, sports and yoga.						✓
OC12	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.		✓				

F.Y.B.Sc. (I.T.) (Semester - I)
CC- National Service Scheme (2521612)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Students will comprehend fundamental ideas and facts about the National Service Program.		✓				
OC2	Students will learn the essentials of NSS-related procedures.		✓				
OC3	Students will learn social work skills (such as Voter Awareness, Campus Cleanup, Tree Plantation, and Rallies).			✓			

F.Y.B.Sc. (I.T.) (Semester - II)**MJ - OOPs with C++ (1012111)****Course Outcomes**

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Students can explain the key concept of OOP and their application in software development.		✓				
OC2	Students can Design and implement classes and objects to model real-world entities.						✓
OC3	Students can apply the concepts of polymorphism, virtual functions, inheritance and exception handling in program.			✓			
OC4	Students can apply operator overloading, runtime polymorphism, generic Programming			✓			
OC5	Students can implement file handling concepts in program			✓			

F.Y.B.Sc. (I.T.) (Semester - II)
MJ - Web Designing (1012112)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learners will be able to use the HTML programming language			✓			
OC2	Learners will be able to execute web pages designed using HTML			✓			
OC3	Describe the concepts of World Wide Web, and the requirements of effective web design		✓				
OC4	List various tags in html and use these to create web page			✓			
OC5	Gain necessary skills for designing and developing web applications						✓

F.Y.B.Sc. (I.T.) (Semester - II)

Major Practical II - (OOPS, WEB) (1012113)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Utilize C++ characteristics in software design and development.			✓			
OC2	Explain object-oriented techniques and explain how C++ supports them.		✓				
OC3	Employ C++ to demonstrate practical skill developing object-oriented solutions.			✓			
OC4	Examine a problem statements and design and develop object-oriented software using good coding practices and procedures.						✓
OC5	Design static web pages using Hyper Text Markup Language (HTML).						✓
OC6	Use their learned skills, knowledge and abilities to develop web sites						✓
OC7	Collect information from the user with HTML Forms			✓			
OC8	Enhance the look of web pages by implementing audio and video			✓			

F.Y.B.Sc. (I.T.) (Semester - II)

VSC - Assembly Language Programming (1012411)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Explain the architecture of the 8085 microprocessor and its associated instruction set.		✓				
OC2	Identify the different types of registers and their functions in the microprocessor.	✓					
OC3	Describe the memory organization and addressing modes of the 8085 microprocessor.		✓				
OC4	Write assembly language programs for the 8085 microprocessor using various instructions and addressing modes.			✓			
OC5	Debug and troubleshoot assembly language programs for the 8085 microprocessor using simulators and debuggers.				✓		
OC6	Implement conditional branching and looping constructs in assembly language programs.			✓			
OC7	Use 8085 assembly language programming tools, such as editors, assemblers, and emulators for developing and testing programs.			✓			
OC8	Simulate microprocessor operations using emulators and debuggers.			✓			
OC9	Connect input/output devices, such as LEDs, switches, and displays, to the 8085 microprocessor.			✓			

F.Y.B.Sc. (I.T.) (Semester - II)
SEC - PL/SQL (1012413)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Use PL/SQL variables ,data types, control and conditional statement.			✓			
OC2	Apply sequences and cursor in PL/SQL.			✓			
OC3	Work with Collection and Composite Data Types.			✓			
OC4	Develop PL/SQL structures like functions, procedures and triggers for database applications.						✓
OC5	Handle errors and exceptions in PL/SQL programs.			✓			
OC6	Develop PL/SQL packages.						✓

F.Y.B.Sc. (I.T.) (Semester - II)

VEC - Foundation of Behavioral Skills – Basic Level (2541515)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learners will be able to Define and Identify different life skills required in personal and professional life	✓					
OC2	Learners will develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.			✓			
OC3	Learners will be able to explain the basic mechanics of effective communication and demonstrate these through presentations and take part in group discussions			✓			
OC4	Learners will be able to use appropriate thinking and problem-solving techniques to solve new problems			✓			

F.Y.B.Sc. (I.T.) (Semester - II)
OE - Leadership Management ()

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Generate social sensitization among youth of the nation.						✓
OC2	Students will explore various leadership theories and their applications in real-world scenarios				✓		
OC3	Learner should develop effective communication skills for leading and motivating teams			✓			
OC4	Analyze the dynamics of teamwork and foster a collaborative work environment				✓		

F.Y.B.Sc. (I.T.) (Semester - II)
OE - Content Writing (1461311)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Develop an understanding of the basic concepts in Content Writing		✓				
OC2	Exhibit the ability to understand and differentiate among the various media for which content is written				✓		
OC3	Develop the ability to write content and edit it suitably			✓			
OC4	Exercise creative writing skills.						✓
OC5	To develop analytical, researching, and better comprehension skills.				✓		

F.Y.B.Sc. (I.T.) (Semester - II)

MN - Industry and Service Management (1282211)

Course Outcomes

After completing this course, students will be able to:

CO	Course Outcomes	Revised Bloom's Taxonomy Learning Levels					
		R	U	A	N	E	C
OC1	Learners should Differentiate between various industry types and their characteristics				✓		
OC2	Identify the key factors influencing industry performance and competition		✓				
OC3	Understand the core principles of service management and customer experience		✓				
OC4	Analyse the challenges and opportunities unique to service businesses				✓		