Dr. Vasantraodada Patil Shetkari Shikshan Mandal's
Padmabhooshan Vasantraodada Patil Institute of Technology, Budhgaon

Department of Computer Science and Engineering(Artificial Intelligence and Data Science)

Course Outcomes(COs) and -Program Outcomes(POs) ,Program Specific Outcomes(PSOs) Mapping

Part-I

SY B.Tech	
Course Code and Course Name:	
BTBSC301.1	Understand the concept of LT & ILT.
BTBSC301.2	Solve problems related to Fourier transform to Deep Learning, Signal & Image processing.
BTBSC301.3	Understand the concepts of linear algebra and apply Linear Programming, Computer Graphics and
BTBSC301.4	Understand the concepts of PDE and apply it in data analysis.
BTBSC301.5	Analyze function of complex variables.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTBSC301.1	3		2											1
BTBSC301.2	3		2											1
BTBSC301.3	3		2											1
BTBSC301.4	3		2											1
BTBSC301.5	3		2											1

Course Code and Course Name: An Introduction to Artificial Intelligence (BTAIC302)	
BTBSC302.1	Discuss Meaning, Scope and Stages of Artificial Intelligence
BTBSC302.2	Understand and Implement Problem Space and Search Strategies for Solving problems.
BTBSC302.3	Discuss the Search Techniques and Knowledge Representation.
BTBSC302.4	Apply search for solving Constraint Satisfaction Problems and Game-playing.
BTBSC302.5	Discover the Application of Artificial Intelligence and Analyze Impact of AI on Society.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTBSC302.1	3	2												2
BTBSC302.2	3	2												2
BTBSC302.3	3	2												2
BTBSC302.4	3	2												2
BTBSC302.5	3	2				2								2

Course Code and Course Name:Data Structure and Algorithm Using Python (BTAIC303)	
BTAIC303.1	Write programs using basic concepts of Python Programming.
BTAIC303.2	Implement algorithms for arrays, linked structures, stacks, queues, trees, and graphs.
BTAIC303.3	Write programs that use arrays, linked structures, stacks, queues, trees, and graphs.
BTAIC303.4	Compare and contrast the benefits of dynamic and static data structures implementation.
BTAIC303.5	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIC303.1	3	2	2	2									2	
BTAIC303.2	3	2	2	2									2	
BTAIC303.3	3	2	2	2									2	
BTAIC303.4	3	2											2	
BTAIC303.5	3	2											2	

Course Code and Course Name: Computer Architecture and Operating System (BTESC304)	
BTESC304.1	Understand the theory and architecture of central processing unit & Analyze some of the design issues in terms
BTESC304.2	Use appropriate tools to design verify and test the CPU architecture & Learn the concepts of parallel processing,
BTESC304.3	Understand the architecture and functionality of central processing unit & Exemplify in a better way the I/O and
BTESC304.4	Describe and explain the fundamental components of a computer operating system
BTESC304.5	Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management,

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTESC304.1	3	2											1	
BTESC304.2	3	2											1	
BTESC304.3	3	2											1	
BTESC304.4	3	2											1	
BTESC304.5	3	2											1	

Course Code and Course Name: Digital Logic & Signal Processing (BTESC305)	
BTESC305.1	Use the basic logic gates and various reduction techniques of digital logic circuit in detai
BTESC305.2	Understand mathematical description and representation of various signals and systems.
BTESC305.3	Develop input output relationship for linear shift invariant system and understand the convolution operator for
BTESC305.4	Understand use of different transforms and analyze the discrete time signals and systems.
BTESC305.5	Understand the concept of correlation, regression and spectral density.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTESC305.1	2	2											1	
BTESC305.2	2	2											1	
BTESC305.3	2	2											1	
BTESC305.4	2	2											1	
BTESC305.5	2	2											1	

Course Code and Course Name:Artificial Intelligence Lab (BTAIL306)	
BTAIL306.1	Practicing of programming languages such as Python, Java, and C++ for AI development.
BTAIL306.2	Apply search algorithms like Depth-First Search (DFS) and Breadth-First Search (BFS) to solve graph-based AI problems
BTAIL306.3	Implement optimization strategies including Alpha-Beta Pruning and approaches to solve NP-hard problems such as the T
BTAIL306.4	Communicate effectively in technical and non-technical environments.
BTAIL306.5	Accept professional and ethical responsibility of engineering technology profession.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIL306.1	3		2		3							1	2	2
BTAIL306.2	3		2		3							1	2	2
BTAIL306.3	3		2		3							1	2	2
BTAIL306.4										2			2	2
BTAIL306.5								2	2				2	2

Course Code and Course Name: Data Structure and Algorithm using Python (BTAIC306)	
BTAIL306.1	Experiment with Python Programming .
BTAIL306.2	Demonstrate behavior of linear and nonlinear structures using algorithms.
BTAIL306.3	Experiment various operations of linear and non-linear data structures using Python .
BTAIL306.4	Communicate effectively in technical and non-technical environments.
BTAIL306.5	Accept professional and ethical responsibility of engineering technology profession.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIL306.1	3		2		2								2	
BTAIL306.2	3		2		2								2	
BTAIL306.3	3		2	2	2								2	
BTAIL306.4										2			2	
BTAIL306.5								2	2				2	

T.Y. B.Tech

Course Code and Course Name: Computer Network and Cloud Computing (BTAIC501)	
BTAIC501.1	Analyze the requirements for a given organizational structure and select the most appropriate networking archite
BTAIC501.2	Specify and identify deficiencies in existing protocols, and then go onto select new and better protocols.
BTAIC501.3	Have a basic knowledge of installing and configuring networking applications.
BTAIC501.4	Understand the different cloud computing environments.
BTAIC501.5	Apply concepts of virtualization and various cloud services to design, develop and deploying cloud applications.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIC501.1	3	2												
BTAIC501.2	3	2												
BTAIC501.3	3	2											2	
BTAIC501.4	3	2			2								2	
BTAIC501.5	3	2			2								2	

Course Code and Course Name: Machine Learning (BTAIC502)	
BTAIC502.1	Develop a good understanding of fundamental principles of machine learning.
BTAIC502.2	Formulation of a Machine Learning problem.
BTAIC502.3	Develop a model using supervised/unsupervised machine learning algorithms for
BTAIC502.4	Evaluate performance of various machine learning algorithms on various data sets of a domain.
BTAIC502.5	Design and Concrete implementations of various machine learning algorithms to solve a given problem using

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIC502.1	3												2	2
BTAIC502.2	3	2	2	2									2	2
BTAIC502.3	3	2	2	2									2	2
BTAIC502.4	3	2	2	2									2	2
BTAIC502.5	3	2	2	2									2	2

Course Code and Course Name: Humanities,Social Sciences including Management Course- I: Business	
BTAIHM503B.1	Study of business.
BTAIHM503B.2	Understand Intercultural Communication.
BTAIHM503B.3	Aware Barriers to Communication.
BTAIHM503B.4	Study of Interpersonal Communication.
BTAIHM503B.5	Understand Negotiation and Conflict Management.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIHM503B.1	3	2						1		2		1		
BTAIHM503B.2	3	2						1	2	2		1		
BTAIHM503B.3	3	2						1	2	2		1		
BTAIHM503B.4	3	2						1	2	2		1		
BTAIHM503B.5	3	2						1		2		1		

Course Code and Course Name:Programe Elective II -Advanced Database Systems (BTAIPE504A)	
BTAIPE504A.1	Summarize the basic concept of Data base System.
BTAIPE504A.2	Understand relational database models.
BTAIPE504A.3	Demonstrate working of advanced SQL.
BTAIPE504A.4	Understand data warehousing and mining concepts.
BTAIPE504A.5	Understand the advanced transaction processing.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIPE504A.1	2	2										1		1
BTAIPE504A.2	2	2	2									1		1
BTAIPE504A.3	2	2	2									1		1
BTAIPE504A.4	2	2	1									1		1
BTAIPE504A.5	2	2	1									1		1

Course Code and Course Name: Software Engineering and Testing(BTAIOE505C)	
BTAIOE505C.1	To use the techniques, skills, and modern engineering tools necessary for engineering practice.
BTAIOE505C.2	To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
BTAIOE505C.3	To apply software testing knowledge and its processes to software applications.
BTAIOE505C.4	To identify various software testing problems and solving software testing problems by designing and selecting software test models, criteria, strategies and methods.
BTAIOE505C.5	To apply the techniques learned to improve the quality of software development.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIOE505C.1	2	2									1			1
BTAIOE505C.2	2	2	2								1			1
BTAIOE505C.3	2	2	2								1			1
BTAIOE505C.4	2	2									1			1
BTAIOE505C.5	2	2									1			1

Course Code and Course Name: Machine Learning Lab (BTAIL506)	
BTAIL506.1	Experiment with Python Programming and Python libraries.
BTAIL506.2	Implement/ Build Machine learning models
BTAIL506.3	Analyze/ Test performance of Machine Learning models.
BTAIL506.4	Communicate effectively in technical and non-technical environments
BTAIL506.5	Accept professional and ethical responsibility of engineering technology profession.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIL506.1	2		2		3								2	2
BTAIL506.2	2	2	2		3								2	2
BTAIL506.3	2	2	2	3	3								2	2
BTAIL506.4										2				
BTAIL506.5								2	2					

Course Code and Course Name: Competitive Programming Lab (BTAIL506)	
BTAIL506.1	Assess and apply DDL and DML statements through SQL.
BTAIL506.2	Execute various advanced queries execution such as relational constraints, joins, set operations, aggregate functi
BTAIL506.3	Implement advanced database concepts such as trigger, views and embedded SQL.
BTAIL506.4	Adapt effective written and oral presentation skills.
BTAIL506.5	Learn professional and ethical behavior to carry forward in their life

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIL506.1	2	2											2	1
BTAIL506.2	3	3	3		2								2	1
BTAIL506.3	3	3	3		2								2	1
BTAIL506.4										2				
BTAIL506.5								2	2					

Course Code and Course Name: Mini Project-I (BTAIM507)	
BTAIM507.1	Identify specific problem from selected domain .
BTAIM507.2	Analyze the hardware and /or software requirements of the proposed work by surveying technical literature, latest technol
BTAIM507.3	Design technical artifact using relevant tools and technologies to meet desired need.
BTAIM507.4	Adapt effective written and oral presentation skills.
BTAIM507.5	Learn professional and ethical behavior to carry forward in their life.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIM507.1	3	3		2		2	2		2			2	2	1
BTAIM507.2	3		2	2	3	2	2		2			2	2	1
BTAIM507.3	3	3	2	2	3	2	2	2	2		2		2	1
BTAIM507.4								2	2	2	2			
BTAIM507.5								2	2	2	2			

B.Tech	
Course Code and Course Name: Natural Language Processing (BTAIC701)	
BTAIC701.1	Understand the basics of Natural language processing.
BTAIC701.2	Analyze the different language models and vector semantics.
BTAIC701.3	Understand the sequence labelling for text analysis.
BTAIC701.4	Implement text classification and sentiment analysis systems.
BTAIC701.5	Implement recurrent network for language models and illustrate the NLP applications

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIC701.1	3	2												
BTAIC701.2	3	2	2											2
BTAIC701.3	3	2												2
BTAIC701.4	3	2	2											2
BTAIC701.5	3	2	2											2

Course Code and Course Name: Advanced Computer Vision (BTAIC702)	
BTAIC702.1	Demonstrate a solid understanding of fundamental computer vision & image processing concepts.
BTAIC702.2	Apply various computer vision algorithms and techniques in image processing.
BTAIC702.3	Apply various computer vision algorithms and techniques to solve real-world engineering problems, such as object recognition, motion analysis, and texture.
BTAIC702.4	Analyze and interpret results obtained from computer vision algorithms, and critically evaluate their
BTAIC702.5	Implement and evaluate computer vision algorithms using programming languages and libraries commonly used in the field, such as Python and OpenCV.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIC702.1	3													2
BTAIC702.2	3	2												2
BTAIC702.3	3	2												2
BTAIC702.4	3	2												2
BTAIC702.5	3	2												2

Course Code and Course Name: Data Engineering (BTAIC703)	
BTAIC703.1	Understand the importance of data engineering and its workflow in managing and integrating data from various
BTAIC703.2	Apply advanced data manipulation techniques using Excel functions and tools for efficient data processing.
BTAIC703.3	Utilize Power BI to connect, transform, and model data from diverse sources into meaningful relationships.
BTAIC703.4	Employ Tableau to prepare and transform data through connections, blending, and calculated fields.
BTAIC703.5	Integrate and automate data pipelines across tools to streamline data workflows and promote collaboration.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIC703.1	2	2										1		1
BTAIC703.2	2	2	2									1		1
BTAIC703.3	2	2	2									1		1
BTAIC703.4	2	2										1		1
BTAIC703.5	2	2										1		1

Course Code and Course Name: Full Stack Development (BTAIPE704D)	
BTAIPE704D.1	Implement and analyze behavior of web pages using HTML and CSS.
BTAIPE704D.2	Apply the client-side technologies for web development.
BTAIPE704D.3	Analyze the concepts of Servlet and JSP.
BTAIPE704D.4	Analyze the Web services and frameworks.
BTAIPE704D.5	Apply the server side technologies for web development.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIPE704D.1	3	2											2	
BTAIPE704D.2	3	2											2	
BTAIPE704D.3	3	2											2	
BTAIPE704D.4	3	2											2	
BTAIPE704D.5	2	2											2	

Course Code and Course Name: Mobile Application Development (BTAIOE705D)	
BTAIOE705D.1	Understand Android architecture, activities and their life cycle.
BTAIOE705D.2	Apply the knowledge to design user interface using Android UI and Component.
BTAIOE705D.3	Describe Memory and File operations in Android.
BTAIOE705D.4	Manage system database, remote database operations using web services and Firebase.
BTAIOE705D.5	Apply knowledge of map, location services, Graphics, android system and background services.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIOE705D.1	2	2										1	2	1
BTAIOE705D.2	2	2	2	2								1	2	1
BTAIOE705D.3	2				2							1	2	1
BTAIOE705D.4	2				2							1	2	1
BTAIOE705D.5	2				2							1	2	1

Course Code and Course Name:Natural Language Processing lab (BTAIL707)	
BTAIL707.1	Apply foundational NLP techniques such as tokenization, stemming, lemmatization, regular expressions, and POS tagging for text preprocessing and analysis.
BTAIL707.2	Implement and evaluate statistical and machine learning models including HMM, logistic regression, and NER for tasks such as POS tagging, chunking, and text classification.
BTAIL707.3	Develop deep learning models using RNN, LSTM, and GRU for advanced NLP tasks such as sequence labeling and word
BTAIL707.4	Communicate effectively in technical and non-technical environments.
BTAIL707.5	Accept professional and ethical responsibility of engineering technology profession.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIL707.1	3	2			3			2	2	1			2	1
BTAIL707.2	3	2			3			2	2	1			2	2
BTAIL707.3	3	2			3			2	2	1			2	2
BTAIL707.4								2	2	3				
BTAIL707.5								2	2	2				

Course Code and Course Name:Data Engineering Lab (BTAIL707)	
BTAIL707.1	Design and use various methodologies present in data visualization.
BTAIL707.2	Apply the various process and tools used for data visualization.
BTAIL707.3	Communicate effectively in technical and non-technical environments.
BTAIL707.4	Accept professional and ethical responsibility of engineering technology profession.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIL707.1	3	2			2							1	2	1
BTAIL707.2	3	2			2							1	2	1
BTAIL707.3										2		1		
BTAIL707.4								2	2			1		

Course Code and Course Name: Project Work/ Internship (BTAIM708)	
BTAIM708.1	Identify and formulate the real-world problem for their major project in the field of their own interest.
BTAIM708.2	technical project.
BTAIM708.3	Analyze the hardware and /or software requirements of the proposed work.
BTAIM708.4	debugging the software/hardware pertaining to their major project .
BTAIM708.5	Defend or argue or appraise the results obtained during project work,
BTAIM708.6	Design the prototype of the selected idea.
BTAIM708.7	Exercise all the managerial (project planning, scheduling) and behavioral skills in a team to accomplish the goals of their project.
BTAIM708.8	,competitions conferences/journals leading to effective communication.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BTAIM708.1	3	3		2		2	2		2			2	2	2
BTAIM708.2	3	3	2	2					2			2	2	2
BTAIM708.3	3	3	2	2					2			2	2	2
BTAIM708.4	3		2	2	3	2	2		2			2	2	2
BTAIM708.5								3	2	2		2	2	2
BTAIM708.6			3	3	3	2	2		2	2		2	2	2
BTAIM708.7								3	2		3	2		
BTAIM708.8								3	2	3		2		