

**Rayat Shikshan Sanstha's  
KARMAVEER BHAURAO PATIL COLLEGE, VASHI.  
NAVI MUMBAI**

**(Autonomous)**

**Name of the Faculty: Science and Technology**

**Name of the Program : Masters of Science.**

**Program Outcomes (POs)**

<b>PO-1</b>	<b>Disciplinary Knowledge</b>	Understand the basic concepts, fundamental principles, theoretical formulations and experimental findings and the scientific theories related to Physics, Chemistry, Mathematics, Microbiology, Computer Science, Biotechnology, Information Technology and its other fields related to the program.
<b>PO-2</b>	<b>Communication Skills</b>	Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
<b>PO-3</b>	<b>Critical Thinking</b>	Propose novel ideas in explaining the scientific data, facts and figures related to science and technology.
<b>PO-4</b>	<b>Analytical Reasoning and Problem Solving</b>	Hypothesize, analyze, formulate and interpret the data systematically and solve theoretical and numerical problems in the diverse areas of science and technology.
<b>PO-5</b>	<b>Sense of Inquiry</b>	Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
<b>PO-6</b>	<b>Use of Modern Tools</b>	Operate modern tools, equipment, instruments and laboratory techniques to perform the experiments and write the programs in different languages (software).
<b>PO-7</b>	<b>Research Skills</b>	Understand how to design, collect, analyze, interpret and evaluate information/data that is relevant to science and technology.
<b>PO-8</b>	<b>Application of Knowledge</b>	Develop a scientific outlook and apply the knowledge with respect to the subject.
<b>PO-9</b>	<b>Ethical Awareness</b>	Imbibe ethical, moral and social values and exercise it in day to day life.



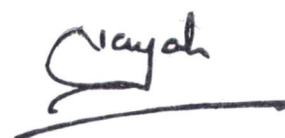
<b>PO-10</b>	<b>Teamwork</b>	Work collectively and participate to take initiative for various field-based situations related to science, technology and society at large.
<b>PO-11</b>	<b>Environment and Sustainability</b>	Create social awareness about the environment and develop sustainability for betterment of the future.
<b>PO-12</b>	<b>Lifelong Learning</b>	Ability of self-driven to explore, learn and gain knowledge and new skills to improve the quality of life and sense of self-worth by paying attention to the ideas and goals throughout the life.



**Program Coordinator**



**BOS Chairman**



**Principal**



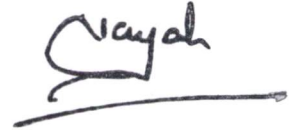
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**KARMAVEER BHAURAO PATIL COLLEGE**  
 VASHI, NAVI MUMBAI 400 703.

**Rayat Shikshan Sanstha's**  
**KARMAVEER BHAURAO PATIL COLLEGE, VASHI.**  
**NAVI MUMBAI**  
**(Autonomous)**  
**Department of Computer Science**  
**Program Specific Outcomes(PSO)**

<b>PSO-1</b>	Cultivate the field of computing and its latest trends, to pursue teaching, research & development activities and to work effectively in a team.
<b>PSO-2</b>	Ability to develop strong analytical skills, critical thinking and experimental skills
<b>PSO-3</b>	Ability to solving on Computational problems, system networking knowledge, use of technology with innovative ideas

  
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Title of Specific Program : M.Sc. Computer Science		
Course Outcomes:		
Course Code	Course Name	Course Outcomes
<b>Semester I</b>		
PGCS101	Analysis of Algorithms	<p><b>CO1:</b> Apply the algorithms and design techniques to solve problems.[3]*</p> <p><b>CO2:</b> Compare two or more algorithms in terms of time and space complexity on growth functions.[4]*</p> <p><b>CO3:</b> Evaluation of Algorithms using Dynamic Programming approach, Greedy strategy and Minimum spanning trees (MST) method.[4]*</p> <p><b>CO4:</b> Apply the concept of Lower Bound on RSA public-key cryptosystem NP-Completeness and Approximation algorithms.[4]*</p>
PGCS102	Advanced Networking Concepts	<p><b>CO1:</b> Identify the different types of network topologies, protocols, virtualization technologies primer and central service access. [2]*</p> <p><b>CO2:</b> Examine the layers of the OSI model and TCP/IP application of manet, Ad Hoc networks, Routing protocols and Transmission techniques. [3]*</p> <p><b>CO3:</b> Determine the different types of network devices and their functions within a network[3]*</p> <p><b>CO4:</b> Illustrate the basic concepts of Sensor networks, and how they can be used to assist in network design and implementation[3]*</p>
PGCS103	Advanced Database Systems	<p><b>CO1:</b> Develop knowledge and understanding of the underlying principles of Distributed Database Management System there Architecture and design strategies in detail with XML.[6]*</p> <p><b>CO2:</b> Evaluate the proper functions of transaction management using ACID properties, Deadlock management, database reliability and parallel query Evaluation .[5]*</p> <p><b>CO3:</b> Explain the concept of NoSQL Basics &amp; Accessing Data from MongoDB.[2]*</p>



		<b>CO4:</b> Describe the Gaining Proficiency With NoSQL, MongoDB Query ,HBase,RDBMS and ACID.[4]*
PGCS104	Advanced Python Programming	<b>CO1:</b> Explain fundamental understanding of the Python programming language.[2]* <b>CO2:</b> Describe common Python functionality and features used for data science.[4]* <b>CO3:</b> Illustrate the Object-oriented Programming concepts in Python.[3]* <b>CO4:</b> Visualize and describe DataFrame structures for cleaning and processing data.[1]*
PGCS105	Embedded and IOT Technology	<b>CO1:</b> Design and executive projects in IoT with Automatic Identification and Data Capture.[3]* <b>CO2:</b> Describe basic components and functionalities of Embedded System including its hardware. [4]* <b>CO3:</b> Design case studies in IoT and replicate the same for more detailed analysis of the IoT development.[3]*
PGCS106	Image Processing and Pattern Recognition	<b>CO1:</b> Define the fundamental concepts of a digital image processing system.[1]* <b>CO2:</b> Analyze images in the frequency domain using various transforms.[4]* <b>CO3:</b> Evaluate the techniques for image enhancement and image restoration.[5]* <b>CO4:</b> Develop image patterns using statistical patterns.[6]*
<b>Semester II</b>		
PGCS201	Research in Computing	<b>CO1:</b> Develop analytical skills by applying scientific methods.[6]* <b>CO2:</b> Review the existing research article on Machine learning & Business analytics[2]* <b>CO3:</b> Survey the specific research areas in field of Computer Science[6]* <b>CO4:</b> Test & validate the proposed methodology on research problems.[6]*
PGCS202	Business Intelligence and Big Data Analytics (Business Intelligence)	<b>CO1:</b> Explain the operational and decision support system.[2]*



		<p><b>CO2:</b> Evaluate the impact of use and information using knowledge discovery in databases and KDD process models.[5]*</p> <p><b>CO3:</b> Summarize the data mining concepts with the help of Apriori algorithm, lift conviction and trees.[5]*</p> <p><b>CO4:</b> Construct data models and prototypes needed to gain stakeholder support to achieve business objectives.[3]*</p>
PGCS203	Social Network Analysis	<p><b>CO1:</b> Represents social network relationships through graph theory[4]*</p> <p><b>CO2:</b> Analyze the social network relationship and ties between different egos networks using a page ranking algorithm.[4]*</p> <p><b>CO3:</b> Compare different Similarity and dissimilarity distance measuring approaches[4]*</p> <p><b>CO4:</b> Understand and analyze two mode Bi-partite data structures.[1]*</p>
PGCS204	Data visualization using R	<p><b>CO1:</b> Explain basic programming language concepts using R[1]*</p> <p><b>CO2:</b> differentiate between different R data structures such as: string, number, vector, matrix; data frame, factor, date and time object[5]*</p> <p><b>CO3:</b> Collect detailed information raw data using R profiler[4]*</p> <p><b>CO4:</b> Visualize your data using base R graphics[1]*</p>
PGCS205	Cyber and Information Security (Network Security)	<p><b>CO1:</b> Identify when attacks are happening inside networks[2]*</p> <p><b>CO2:</b> Collect evidence of network intrusions[4]*</p> <p><b>CO3:</b> Test networks and systems for vulnerabilities[6]*</p> <p><b>CO4:</b> Prepare for defend against network attacks[6]*</p>
PGCS206	Machine Intelligence (Fundamentals of Machine Intelligence)	<p><b>CO1:</b> Discuss Classification, regression, and conditional probability estimation.[2]*</p> <p><b>CO2:</b> explain resampling methods with Linear models and nonlinearity using kernel methods.[1]*</p> <p><b>CO3:</b> Identify the Machine Learning model to choose for each type of problem.[2]*</p> <p><b>CO4:</b> predict the output by applying Clustering &amp; Classification algorithm.[5]*</p>



<b>Semester III</b>		
PGCS301	Business Intelligence and Big Data Analytics –II	<p><b>CO1:</b> Describe Big Data, Statistical concepts, Data Analysis, neural network and fuzzy logic.[4]*</p> <p><b>CO2:</b> Illustrate the various algorithms using mapreduce.[3]*</p> <p><b>CO3:</b> Explain shingling of documents using various applications such as jaccard's similarity and methods of high degree of similarity, locality sensitive hashing.[1]*</p> <p><b>CO4:</b> Summarize the stream concepts, decaying windows, Real time analytics platform(RTAP)[4]*</p>
PGCS302	Distributed Computing	<p><b>CO1:</b> Explain distributed system and cloud models[1]*</p> <p><b>CO2:</b> Explain distributed computation model on large datasets using parallel and distributed programming approaches over cloud platforms.[1]*</p> <p><b>CO3:</b> Analyze the synchronization process[4]*</p>
PGCS303	Natural Language Processing	<p><b>CO1:</b> Describe the concepts of morphology, syntax, semantics, discourse &amp; pragmatics of natural language[4]*</p> <p><b>CO2:</b> Discover various linguistic and statistical features relevant to the basic NLP task, namely, spelling correction, morphological analysis, parts-of speech tagging, parsing, and semantic analysis[3]*</p> <p><b>CO3:</b> Introduce various NLP software libraries and data sets publicly available[1]*</p> <p><b>CO4:</b> Analyze NLP problems to decompose them inadequate independent components and develop real-life applications[4]*</p>
PGCS304	Data Visualization using Tableau	<p><b>CO1:</b> Understand types of data and data visualization methods[2]*</p> <p><b>CO2:</b> Understand the need of data visualization.[2]*</p> <p><b>CO3:</b> Create and design visualizations and dashboards [6]*</p> <p><b>CO4:</b> Evaluate the performance of visualization technique[5]*</p> <p><b>CO5:</b> Apply data visualization using open source tool Tableau[3]*</p>



PGCS305A	Cyber and Information Security- II (Cyber Forensics)	<p><b>CO1:</b> Define the objectives of computer forensics in law enforcement, evidence, case studies, investigation, computer forensic techniques, Vulnerabilities and Computer forensics Technologies. [1]*</p> <p><b>CO2:</b> Apply the various techniques of data recovery, data hiding, evidence collection rules, Verification &amp; Authentication[3]*.</p> <p><b>CO3:</b> Analyze Network based evidence, Principles of internetworking, protocols, various acquisition methods, NIDS &amp; NIPS Systems.[4]*</p> <p><b>CO4:</b> Determine the concepts of mobile forensics using identification and data interception using web proxies and evidence analysis .[3]*</p>
PGCSP305B	Machine Learning –II (Advanced Machine Learning)	<p><b>CO1:</b> Discuss detailed knowledge on Basics of Probability, Conditional Probability and various distributions[2]*</p> <p><b>CO2:</b> Explain the concepts of Monte Carlo simulation inference in Machine learning[2]*</p> <p><b>CO3:</b> Summarize the distribution of scenarios using confidence intervals[4]*</p> <p><b>CO4:</b> Describe the various terms related to neural networks, such as activation, backpropagation and feedforward.[2]*</p>
<b>Semester IV</b>		
PGCS401	Business Intelligence and Big Data Analytics –III	<p><b>CO1:</b> Describe the distance based algorithms, KNN methods, trees, document classification, regression models and trees.[2]*</p> <p><b>CO2:</b> Determine the concept of Eigenvalue, Eigen vectors and decompositions.[3]*</p> <p><b>CO3:</b> Analyze the Chi Squared Automatic Interaction Detector.[4]*</p> <p><b>CO4:</b> Interpret the Evaluation techniques.[2]*</p>
PGCS402	Internship	-----
PGCS403	Project	-----
PGCS404	MOOCs or GoLang	<p><b>CO1:</b> Gain a sense of when to use basic language features.[1]*</p> <p><b>CO2:</b> Understand the basic syntax and control structures of the language.[2]*</p>





		<p><b>CO3:</b> Organize code through the use of packages.[5]*</p> <p><b>CO4:</b> Apply Go's concurrency model to build massively parallel systems[3]*</p> <p><b>CO5:</b> Use the Go runtime to build and compile projects.[6]*</p>
PGCS405A	Cyber and Information Security- II (Cryptography and CryptAnalysis)	<p><b>CO1:</b> Describe elementary number theory, algorithms,quadratic residues,reciprocity and theorems.[2]*</p> <p><b>CO2:</b> Summarize the cryptography as ciphers, algorithm modes, cryptographic hash functions.[4]*</p> <p><b>CO3:</b> Apply the concepts of RSA algorithms, public key cryptosystems, Diffie-Hellman Key Agreement and Knapsack problem.[3]*</p> <p><b>CO4:</b> Memorize key agreement and key agreement scheme, public key infrastructures and models privacy in cryptosystems &amp; Trust model.[1]*</p>
PGCS405B	Machine Learning –III (Computational Intelligence)	<p><b>CO1:</b> Discuss Artificial neural networks and reinforcement in machine learning.[2]*</p> <p><b>CO2:</b> Explain the concepts of genetics algorithms and working in machine learning.[2]*</p> <p><b>CO3:</b> Analyze the Particle Swarm Optimization(PSO).[4]*</p> <p><b>CO4:</b> Develop fuzzy logic systems for various applications.[3]*</p>

**Note: Number in bracket() indicates cognitive levels of revised Bloom's Taxonomy as follows:(1):Remembering,(2):Understanding,(3):Applying,(4):Analyzing,(5):Evaluating, (6):Creating,**

  
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