

**ST.PETER'S COLLEGE, KOLENCHERY**  
**DEPARTMENT OF COMPUTER SCIENCE**

**PROGRAMME - M.Sc. Computer Science (Data Analytics)**

**PROGRAMME EDUCATIONAL OUTCOMES (PEO)**

<b>PEO1</b>	<b>Problem solving</b> - Implement their critical thinking and problem- solving skills in professional practices
<b>PEO2</b>	<b>Global perspective</b> - Understand the social, economic & scientific connections that link the world nations & people

**PROGRAMME OUTCOMES (PO)**

<b>PO1</b>	<b>Knowledge in Science</b> - Ability to understand the background knowledge of the field or environment of techniques of data analysis.
<b>PO2</b>	<b>Critical Thinking</b> - Identify the assumptions required for dividing the complex problems into smaller ones and formulate solutions.
<b>PO3</b>	<b>Computational Thinking</b> - To determine the interrelated set of skills and practices for solving complex problem compute programming techniques.
<b>PO4</b>	<b>Research Awareness</b> - Develop Computer Skills to compete in Scientific research areas keeping ethical issues.

**PROGRAMME SPECIFIC OUTCOMES (PSO)**

<b>PSO1</b>	<b>Problem Solving:</b> Evaluate the problems using knowledge, logic, skills and attitudes acquired through informed learning
<b>PSO2</b>	<b>Effective Communication:</b> Develop skills through seminars, project presentations and classroom activity to utilize them in practical situations.

## COURSE OUTCOMES

### SEMESTER 1

Name of Course: CA030101- Statistics for Data Analytics

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Understand the basic concepts of probability theory and hypothesis testing	PO1,PO2,PSO2	U	22
CO2	Illustrate to time series analysis	PO4	U	15
CO3	Utilization of four fundamental characteristics of distribution 1, distribution 2 and distribution.	PO3,PO4	AP	18
CO4	Application of correlation and regression apply theory of correlation and regression.	PO2,PO3	AP	17

Name of Course CA030102:Introduction to Data Analytics and Machine learning

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Define the concepts of data analytics and machine learning	PO1,PO2,PSO2	R	12 hr
CO2	Relate machine learning techniques to solve real world problems.	PO1,PO2,PO3,PSO1	R	13 hr
CO3	Understand the basic concepts of Supervised Learning -Regression and classification	PO1,PO2,PO3,PSO2	U	15 hr
CO4	Understand the concepts of Unsupervised Learning	PO1,PO3,PO4,PSO2	U	18 hr

Name of Course: CA030103- Advanced Operating Systems

Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Describe the concepts of Operating System and its role	PO1,PSO 1	R	12 hr
CO2	Understanding the concept of process CPU Scheduling, Synchronization.	PO1, PO2,PS01	U	15 hr
CO3	Categorize the operating system's resource, deadlock, and memory management techniques.	PO1, PO2,PSO 1	U	17 hr
CO4	Understanding the role of the Linux Operating System.	PO1,PS02	U	10 hr

Name of Course: CA030104- Data structures using C

Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Understand the basic concept of computer programming and data structure.	PO1, PO2, PO3,PSO 1	U	17 hr
CO2	Implementations of Array, stack and queue	PO1, PO2,PSO 1	AP	15 hr
CO3	Analysis of trees and graphs.	PO1, PO2,PSO 1	AN	12 hr
CO4	Analyse the hash functions concepts of collision and its resolution methods.	PO1, PO2, PO3,PSO 2	AN	10 hr

Name of Course: CA030105- Python for Data Analytics

Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Define the basic concepts of python programming.	PO1,PO2	R	15Hr
CO2	Explain the working of Numpy and Pandas library	PO1, PO3,PSO 1	U	10 Hr
CO3	Demonstrate data analysis using visualization and Preprocessing of data.	PO1, P02, PO3,PSO 1	U	14 Hr
CO4	Differentiating machine learning algorithms	PO2,PO3, PO4,PSO 2	Ap	15Hr

Name of Course: CA030106- Python & Data structure Lab

Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Understand the basics structure of python & c programming	PO1, PO2,PSO 1	U	40
CO2	Implement python data structures, binary trees, linked list and graph	PO1, PO2, PO3,PSO 1	AP	35
CO3	Analyze the result obtained from Binary trees and Python Data Structures.	PO2, PO3,PSO 1,PSO2	AP	24
CO4	Write Algorithms and programs using python and C Language(Record)	PO1,PO3, PSO1	AP	10

## SEMESTER 2

Name of Course: CA030201- Mathematics for analytics

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Describe the concept of Fuzzy Logic.	PO1	U	20
CO2	Understand the concept of mathematical logic and sets	PO1,PO2 PO3	U	15
CO3	Develop the basics ideas of Linear Algebra	PO1,PO2 PO3	Ap	22
CO4	Solve unconstrained optimization problems	PO1,PO2 PO3	Ap	15

Name of Course: ME010201: CA030202- Advanced Database Management System

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Understand the basic principles of database management systems.	PO1,PS01	U	18hr
CO2	Explain the basic concepts of the relational data model, entity-relationship model and SQL	PO1, PO3,PSO 1	AP	12hr
CO3	Explain the transaction processing and concurrency control concepts.	PO1, PO2, PO3,PSO 1	AP	21 hr
CO4	Understand the concept of object-relational database and distributed databases	PO1,PSO 2	U	21 hr

Name of Course: CA030204- Programming with Java  
Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	State Object Oriented programming concepts and basics of Java	PO1,PSO 2	R	13 hr
CO2	Express the concept of Constructors, Keywords and string functions.	PO3,PO4, PSO2	U	12 hr
CO3	Explain the uses of packages and Exception Handling mechanism	PO1,PO2, PSO2	U	15 hr
CO4	Develop Java programs using the concepts of class, constructors,packages and exception handling	PO3,PO4, PSO2	Ap	20 hr

Name of Course: CA030204- Data Mining and analytics  
Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Describe the concepts of data mining.	PO1,PO4	R	12
CO2	Explain the data mining methods- classification & clustering	PO1,PO2, PO4	U	15
CO3	Interpret frequent patterns and association rules	PO2,PO3, PO4,PSO 2	U	17
CO4	Explain Apriori algorithm, Naive Bayes Classification methods	PO3,PO4, PSO1	Ap	10

**Name of Course: CA030205- Java & SQL Lab**

**Credits given : 3**

	<b>Course Outcomes</b>	<b>POs / PSOs</b>	<b>Cognitive Level</b>	<b>Class Sessions</b>
<b>CO1</b>	<b>Design database schema and Java Programming</b>	<b>PO1,PO3, PSO1</b>	<b>Ap</b>	<b>50</b>
<b>CO2</b>	<b>Implement database applications using procedures, cursors and triggers and Java class</b>	<b>PO1, PO3</b>	<b>An</b>	<b>44</b>
<b>CO3</b>	<b>Analyze the results obtained from the database and Java programming</b>	<b>PO1,PO3, PSO2</b>	<b>Ap</b>	<b>20</b>

**Name of Course: CA030206 Mini Project I**

**Credits given : 2**

	<b>Course Outcomes</b>	<b>POs / PSOs</b>	<b>Cognitive Level</b>	<b>Class Sessions</b>
<b>CO1</b>	<b>Identify a real world problem for data analysis.</b>	<b>PO1,PO2</b>	<b>U</b>	<b>6</b>
<b>CO2</b>	<b>Apply Machine Learning algorithm in normalized datasets.</b>	<b>PO3,PSO 1,PSO2</b>	<b>Ap</b>	<b>8</b>
<b>CO3</b>	<b>Interpret the concepts of Machine Learning algorithm</b>	<b>PO1,PO3, PO4,PSO 1,PSO2</b>	<b>An</b>	<b>10</b>

### SEMESTER 3

Name of Course: CA030301- Statistical Modeling using R

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	State the use of the R and R-Studio's interactive environment	PO1,PO2	R	12 hr
CO2	Illustrate fundamentals of R language with variables, factors, list, vectors, matrix and dataframe.	PO1,PO2, PSO1	U	13 hr
CO3	Illustrate conditions and loops in R programming	PO1,PO2, PO3,PSO 1	U	15 hr
CO4	Develop Program with help of statistical methods and visualization process.	PO2,PO3, PSO1	Ap	17 hr

Name of Course: CA030302- Exploratory Data Analytics for NLP

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	State the concepts and techniques of Natural Language Processing.	PO1,PSO 2	R	12 hr
CO2	Describe Language Processing tools in Python	PO1, PO2,PSO 2	R	18 hr
CO3	Demonstrate Plots, Graphs and Summary Statistics to carry out Exploratory Data Analysis.	PO1, PO2, PO3,PSO 2	U	21 hr
CO4	Understanding the concept of Data Transformation, Grouping Datasets, Hypothesis Testing and Regression, and Model Development.	PO1, PO2, PO4,PSO 2	U	21 hr



Name of Course: CA030303- Computational Research Methodology  
Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Define Fundamentals of Research Methodology.	PO1	R	20
CO2	Illustrate Research Methods and Data Collection Methods	PO1,PO2	U	18
CO3	Understand the ethical issues related to Research and Publication	PO1,PO3, PO4	U	16
CO4	Introduce the basics of Report Writing	PO2,PO4	U	18

Name of Course: Elective 1- CA870301- Sentiment Analytics  
Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Describe Sentiment Analytics and its concepts	PO1	R	18
CO2	Understand the Sentence classification and Aspect based Classification.	PO1,PO2	U	16
CO3	Express the concept of sentiment lexicons and its importance	PO1,PO3	U	22
CO4	Explain the Research Approaches in Sentiment Analysis	PO4	Ap	16

Name of Course: CA030304- Statistical Programming Lab using R  
Credits given : 3

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Develop R programming	PO1,PO2, PSO1	Ap	10 hr

<b>CO2</b>	<b>Execute programming with Data frames and Matrices</b>	<b>PO1,PO2, PO3</b>	<b>Ap</b>	<b>20 hr</b>
<b>CO3</b>	<b>Analyze the results obtained from Data frames and Matrices</b>	<b>PO1,PO2, PO3,PSO 2</b>	<b>AP</b>	<b>15 hr</b>

**Name of Course: CA030305- Mini Project II**

**Credits given : 3**

	<b>Course Outcomes</b>	<b>POs / PSOs</b>	<b>Cognitive Level</b>	<b>Class Sessions</b>
<b>CO1</b>	<b>Identify a real world problem for data analysis.</b>	<b>PO1,PO2</b>	<b>Ap</b>	
<b>CO2</b>	<b>Apply Machine Learning algorithm in normalized datasets.</b>	<b>PO3,PSO 1,PSO2</b>	<b>Ap</b>	
<b>CO3</b>	<b>Interpret the concepts of Machine Learning algorithm</b>	<b>PO1,PO3, PO4,PSO 1,PSO2</b>	<b>An</b>	

## SEMESTER 4

Name of Course: CA030401- Data Visualisation

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Understand the concept of data visualization	PO1,PO2,	U	13 hr
CO2	Describe the Interactive data visualization	PO1,PO2	U	18 hr
CO3	Apply the D3 Based Reusable Chart Library	PO1,PO2	Ap	20 hr
CO4	Understand the concept of Tableau, advanced charts in Tableau	PO1,PO2	U	21 hr

Name of Course: CA860401- Internet Of Things (IoT)

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Define Internet of Things, and its applications	PO1,PO2, PO3,PSO 2	R	12 hr
CO2	Understand the concepts of the Internet of Things, Enabling Technologies, and IoT Architecture.	PO1,PO2, PO3,PSO 2	U	13 hr
CO3	Introduce cloud computing and fog computing from an IoT perspective.	PO1,PO2, PSO2	U	14 hr
CO4	Understand the concept of IoT Enablers and solutions.	PO1,PO2. PSO2	U	16 hr

Name of Course: CA860402- Deep Learning

Credits given : 4

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
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CO1	Define the basics of Neural Network	PO1,PO2	R	25
CO2	Describe the importance of Deep Learning and application in Tensorflow	PO1,PO2, PO3	R	24
CO3	Explain the deep learning techniques and working of CNN & RNN	PO2,PO3, PO4,PSO 1,PSO2	U	23
CO4	Understanding the concepts Reinforcement learning	PO1,PO2, PSO1,PS O2	U	18

Name of Course: CA030402- Project  
Credits given : 5

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Identify a real world dataset	PO1,PO2	An	52
CO2	Implement a machine learning algorithm and Tableau/ Power BI	PO3,PSO 1,PSO2	An	45
CO3	Interpret the concepts of Machine Learning algorithm and Tableau/ Power BI	PO1,PO3, PO4,PSO 1,PSO2	Ap	38

Name of Course: CA030403 Comprehensive Viva - Voce  
Credits given : 2

	Course Outcomes	POs / PSOs	Cognitive Level	Class Sessions
CO1	Understand the basic concepts of data analytics.	PO1,PO2, PO3,PSO 2	U	
CO2	Apply the concepts of data analytics in real word problem	PO1,PO2, PO4,PSO 2	E	