M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Programme: B.A (Hons) in Data Sciences & Analytics

Programme Code: 415

Programme Outcome (PO)

Programme Specific Outcome (PSO)

Program Educational Objectives (PEO)

Course Outcomes (CO)

Approved in 23rd ACM (Resolution 23.05) held on 15th July 2021

School of Social Science

Programme Name: B.Sc. (Hons) in Data Sciences & Analytics

Programme Outcomes (PO's)

B.Sc. (Hons) (Data Science & Analytics) graduates will be able to:

PO-1. Apply the knowledge of political science, sociology, economics, psychology and data sciences /statistics specialization to the solution of complex societal problems.

PO-2. Identify problems by closely examining the situations around them and think holistically about the phenomena and generate viable solutions to these problems. Exhibit the skill of critical thinking and understand scientific texts and place scientific statements and themes in contexts and evaluate them in terms of generic conventions.

PO-3. Demonstrate ability to accommodate the views of others and present their own opinions and complex ideas, in written or oral form, in a clear and concise manner in group settings. Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies.

PO-4. Infer scientific literature, build a sense of enquiry and be able to formulate, test, analyze, interpret, and establish hypothesis and research questions; and to identify and consult relevant sources to find answers.

PO-5. Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.

PO-6. Perform independently and collaboratively as a part of a team to meet defined objectives and carry out work across interdisciplinary fields. Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.

PO-7. Demonstrate empathetic social concern and equity centered national development and act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.

PO-8. Analyze the impact of the scientific solutions in societal and environmental contexts for sustainable development.

PO-9. Demonstrate attitudes of being a life-long learner who passionately pursues self-determined goals in the broadest context of socio-technological changes.

Program Educational Objectives (PEOs)

The objectives of the B.Sc. (hons) (Data Sciences & Analytics) programme are to:

PEO-1. Create a community of informed purveyors of knowledge geared towards academic excellence and increase the knowledge base and skill sets aimed at enhancing their professional competence.

PEO-2. Promote innovation and research by instilling a sense of independent and critical thinking with sensitivity to social needs.

PEO-3. Inculcate strong human values and social, interpersonal and leadership skills required for professional success in evolving global professional environments.

Programme Specific Outcomes (PSOs)

At the end of the B.Sc. (Hons) in Data Sciences & analytics programme, the graduate will be able to:

PSO-1. Apply the sociological knowledge to develop innovative and inclusive understanding to real-world issues.

PSO-2. Acquire the skills necessary to think critically and communicate effectively about sociology and allied domains.

PSO-3. Demonstrate the understanding of life-long learning and leadership qualities through professional development and strive for the betterment of organization, environment, and society.

Course Outcomes (COs)

Course Title & Code: Maths for Data Science (DSC101A)

After the successful completion of this course, the student will be able to:

CO-1. Familiarize with the concept of vectors, theory of matrices and tools for solving system of linear equations

CO-2. Impart knowledge on Eigen values and Eigen vectors.

CO-3. Teach basic concepts of vector spaces and their properties.

CO-4. Explain the concepts of Limit, Continuity and Derivative

Course Outcomes (COs)

Course Title & Code: Programing in R (DSC102A)

After the successful completion of this course, the student will be able to:

CO-1. Understand the fundamental syntax, variety of data formats of R through demonstrations, exercises and writing R script in RStudio

CO-2. Get familiarize with the concepts data types, data structures, iteration, control flow structures, functions, and operators by writing R programs and through examples

CO-3. Use R to read files of different formats, prepare or clean data for analysis, Learn to perform descriptive statistics in R

CO-4. Learn data visualization through ggplot2 package

Course Outcomes (COs)

Course Title & Code: Data Visualization (DSC103A)

After the successful completion of this course, the student will be able to:

CO-1. Design and create data visualizations.

CO-2. Conduct exploratory data analysis using visualization.

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- **CO-3.** Craft visual presentations of data for effective communication.
- **CO-4.** Use knowledge of perception and cognition to evaluate visualization design alternatives.
- **CO-5.** Design and evaluate color palettes for a visualization based on principles of perception.
- **CO-6.** Apply data transformations such as aggregation and filtering for visualization.
- **CO-7.** Identify opportunities for the application of data visualization in various domains.
- **CO-8.** Critique existing visualizations based on data visualization theory and principles.

Course Outcomes (COs)

Course Title & Code: Python Programming (DSC106A)

After the successful completion of this course, the student will be able to:

- **CO-1.** Understand the basis of Algorithms, data types, variable and function.
- **CO-2.** Concept of Data Structure, write function.
- **CO-3.** Understanding the concept of Numerical Python (NumPy), basic indexing, slicing of array.
- **CO-4.** Getting introduce to Pandas objects and Essential functionalities.
- **CO-5.** Getting introduce to matplotlib

Course Outcomes (COs)

Course Title & Code: Regression Techniques and Time Series Analysis (DSC105A)

After the successful completion of this course, the student will be able to:

- **CO-1.** Understand the concept of a simple linear regression model and properties of model parameters;
- **CO-2.** Understand the development of modern statistical models and the relationships of these models;
- **CO-3.** Apply various linear models to address research questions and fit into different data structure;
- **CO-4.** Help the students learn basic analysis of time series data; learn basic concepts in time series regression; learn forecasting based on baseline model, auto-regressive and moving average process; visualization, and analysis of time series data.

Course Outcomes (COs)

Course Title & Code: Inferential Statistics (DSC104A)

After the successful completion of this course, the student will be able to:

- **CO-1.** Identify and analyze critical features of data sets on real-life business situations
- **CO-2.** Understand and apply statistical reasoning to the concept of parameter estimation on mean, proportion, and variance
- **CO-3.** Acquire techniques to calculate problems on point and interval estimation
- **CO-4.** Solve concepts on Testing of Hypotheses both on large and small samples
- **CO-5.** Hypothesize advanced statistical techniques for modeling by exploring practical situations

Course Outcomes (COs)

Course Title & Code: Multivariate Analysis (DSC201A)

After the successful completion of this course, the student will be able to:

- **CO-1.** Learn to develop an in-depth understanding of the Multivariate models, methods and techniques
- **CO-2.** Demonstrate the knowledge and skill of multivariate normal distributions, related probability distributions and their applications
- **CO-3.** Examine the relationships between dependent and independent variables of multivariate models, estimate the parameters and fit a model.
- **CO-4.** Perform, handle and manipulate the analysis of logistic regression.

Course Outcomes (COs)

Course Title & Code: Data Pre-processing (DSC202A)

After the successful completion of this course, the student will be able to:

- **CO-1.** To impart the knowledge and skill of handling structured and real-life unstructure data
- **CO-2.** Familiarise with the tools(Pandas, Numpy, Scikit-learn etc.) to get insight of information hidden in data
- **CO-3.** The basic understanding of Feature Engineering.
- **CO-4.** Empowering students with tools and techniques used in data science for data cleaning and data wrangling.

Course Outcomes (COs)

Course Title & Code: Database Management Systems (DSC203A)

After the successful completion of this course, the student will be able to:

- **CO-1.** Describe the concepts, design, and applications of database systems
- **CO-2.** Explain the principles of data modeling, querying, storage, transactions, and optimization of database systems
- **CO-3.** Analyze the schema and use appropriate normalization techniques for relational databases
- **CO-4.** Develop queries using query languages for a given database system
- **CO-5.** Apply principles of database systems to model data and create queries
- **CO-6.** Design and implement an efficient database system and interface it with a given application

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Registrar
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