



CONTINUING EDUCATION CELL

NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR

G.E. Road, Raipur – 492010 (C.G.)

Ph- (0771)2253934

No./NITRR/CEC/2024/.....

Date: 23/04/2024

NOTICE

Continuing Education Cell, NIT Raipur is going to offer a **certificate course** on “**Applied Data Analytics: A Practical Approach**”. The details are mentioned below.

Course Name	Tentative schedule	Details
“Applied Data Analytics: A Practical Approach”	12th June to 26th June 2024 (02 hrs each day from 5.30PM to 7.30PM)	ANNEXURE-A
(Online mode)		

Interested candidates/organizations can apply in the prescribed application form (**Annexure-B** along with the details of course fee. **The course Fee is given as follows:**

Course Fee	Students of NIT Raipur	Rs. 1200 + 18% GST
	Outside Students (other than NIT Raipur)	Rs. 1500 + 18% GST
	Faculty/ Industry Personnel	Rs. 3000 + 18% GST

The payment can be done either in the form of a Demand Draft (DD) in favour of “Director, NIT, Raipur” payable at Raipur **or through online mode** (*account details in the last page of this document*). **For online payment**, the scanned copy of the application form along with the proof of payment should be sent to cec_assistant@nitrr.ac.in by the due date (~~5th June 2024~~ ^{10th June 2024}). For payment made through DD, the hard copy of the application along with the DD should be **sent to the Chairman, Continuing Education CELL, NIT Raipur, Raipur, Pin:492010** by the due date (~~5th June 2024~~ ^{10th June 2024}). **After payment, participant is required to fill following google form:**

<https://docs.google.com/forms/d/e/1FAIpQLSfUqK--qWJSxoSkUuneLb4ASPRpfYpSeYTR7g8fIy9h44iyjQ/viewform>

For any clarification, please contact the course coordinators, **Dr. Govind Gupta** (Email: gpgupta.it@nitrr.ac.in / Mobile: 9891952480) and **Dr. Mridu Sahu**, (Email: mrisahu.it@nitrr.ac.in / Mobile: 9826501139) Assistant Professor, Department of Information Technology, NIT Raipur, For course details kindly refer to **Annexure- A**. Conduction of the course is subjected to enrolment of minimum number of students.

Dr. Subhojit Ghosh
Chairman,
CEC NIT, Raipur

Email - "Dr. SubhojitGhosh"<sghosh.ele@nitrr.ac.in>, cec_assistant@nitrr.ac.in



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ANNEXURE-A

Course Name: “Applied Data Analytics: A Practical Approach”

Objectives of Training Programme: The main objective of the course is to help the participants in developing a solid understanding of the Data Science and Analytics techniques like data pre-processing, predictive analysis, fundamental of data statistics, machine learning techniques and data visualization etc., with help of emerging data analytics tools like Python/R. The mathematical foundation for analyzing the data will add more knowledge about the data and this will help for decision support systems. This certificate course will help to enhance the knowledge of the participants in the field Data Science and Analytics. This course focus on the delivery of the lectures with full practical approach, case studies and by hands-on practical sessions on diversified range of topics related to Data Science and Analytics.

Learning Outcomes (LO): Upon successful completion of this Training Programme, the participant will be able to:

- Perform analysis of data using Python/R tool
- Perform model fitting using mathematical background.
- Become familiar with the wide range of enabling technologies for data interpretation, data visualization.
- Become families with Data Summarization and Data Generalization techniques.
- Identify appropriate methods for data analysis in various domains.
- Formulate and design data analytic solutions.
- Manage large-scale, complex data and obtain the interpretation.
- Recognize and evaluate the opportunities, needs, and limitations of data.
- Interpret data analytics and communicate the implications to stakeholders.
- Attain data scientist and data engineer positions in a fast-growing field.
- Accelerate progress into related Research and Development in Data Science and Big Data

Salient Feature:

- Detailed explanation of fundamental concept of data Science and analytics alongwith hands-on sessions and live demos.
- Each group of students will be assigned a project, and a mentor will supervise and monitor the assigned project.

Email - "Dr. SubhojitGhosh" <sghosh.ele@nitrr.ac.in>, cec_assistant@nitrr.ac.in



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Course Content

Course Name: “Applied Data Analytics: A Practical Approach”

Module I: Introduction to Data Science and Analytics, Engineering Applications of Data Science and Analytics, Machine Learning Pipeline.

Introduction to Python Programming: Installation of Anaconda, Python Basic: Data types, operators, String operations, Input Function, Print Formatting, comments, Python Program Flow: Indentation, If statement and its related statement, while loop, for loop, range statement, break and continue, Assert, Example of looping Python Functions: defining a function, calling a function, Passing Arguments by Reference Values, Lambda functions and map; List, Multidimensional Lists, File, Exception handling Tuples, Sets, and Dictionaries in Python

Module II:

Data Preprocessing: Types of features, Encoding Categorical Variable. Statistical features, Structured features, Feature transformations, Thresholding and discretization, Data manipulation, standardization and normalization, **Data Normalization:** Min-Max, Z-score, Decimal Scaling

Module III: Feature Engineering

Introduction to Feature Selection: Filter methods: Pearson correlation, Chi-Square, Information Gain **Case-Study** using Python and filter-based feature selection techniques.

Wrapper Method for feature Selection: Forward selection, Backward elimination, Stepwise selection, **Case-Study** using Python and wrapper-based feature selection techniques.

Predictive Modeling: Linear Regression, Multiple Regression analysis, **Case-Study** using Python and Linear regression technique.

Module IV: Supervised and Unsupervised Learning

Types of Machine Learning: Supervised and Unsupervised Learning,

Supervised learning algorithms: K-NN, Logistic regression, **Case-Study** using Python and K-NN,

Random Forest, **Case-Study** using Python and RF, Decision Tree, **Case-Study** using Python and DT, SVM, **Case-Study** using Python and SVM, **Ensemble Learning Model:** Voting-based techniques, **Case-Study** using Python and Voting-based technique.

Module IV: Data Visualization

ML Model Performance Metrics: Confusion Matrix, Accuracy, Precision, Recall, F1-Score, Positive Rate, False Positive Rate, **Case Study** using Python for all metrics; Data Visualization: using Matplotlib python library.



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Tentative Time-table of Certificate Course on “Applied Data Analytics: A Practical Approach”.

[*NOTE: Time of online classes will be finalized after consulting the participants/sponsoring organization.]

Day	Lecture Number	Lecture Detail
Day 1	Lecture 1	Introduction to the Data Science and Analytics, Engineering Applications of Data Science and Analytics
Day 2	Lecture 2	Introduction to Python Programming: Installation of Anaconda, Python Basic: Data types, operators, String operations, Input Function, Print Formatting, comments
Day 3	Lecture 3	Python Program Flow: Indentation, If statement and its related statement, while loop, for loop, range statement, break and continue , Assert, Example of looping
Day 4	Lecture 4	Python Functions: defining a function, calling a function, Passing Arguments by Reference Values, Lambda functions and map
Day 5	Lecture 5	Python: List, Multidimensional Lists, File, Exception handling
Day 6	Lecture 6	Python: Tuples, Sets, and Dictionaries in Python
Day 7	Lecture 7	Data Preprocessing: Types of features, Encoding Categorical Variable. Statistical features, Structured features, Feature transformations,
Day 8	Lecture 8	Data Preprocessing: Thresholding and discretization, Data manipulation, standardization and normalization, Data Normalization: Min-Max, Z-score, Decimal Scaling
Day 9	Lecture 9	Introduction to Feature Selection: Filter methods: Pearson correlation, Chi-Square, Information Gain Case-Study using Python and filter-based feature selection techniques
Day 10	Lecture 10	Wrapper Method for feature Selection: Forward selection, Backward elimination, Stepwise selection, Case-Study using Python and wrapper-based feature selection techniques
Day 11	Lecture 11	Predictive Modelling: Linear Regression, Multiple Regression analysis, Case-Study using Python and Linear regression technique
Day 12	Lecture 12	Types of Machine Learning: Supervised and Unsupervised Learning Supervised learning algorithms: K-NN, Logistic regression, Case-Study using Python and K-NN; Supervised learning algorithms: Random Forest, Case-Study using Python and RF
Day 13	Lecture 13	Supervised learning algorithms: Decision Tree, Case-Study using Python and DT; Supervised learning algorithms: SVM, Case-Study using Python and SVM
Day 14	Lecture 14	Ensemble Learning Model: Voting-based techniques, Case-Study using Python and Voting-based technique
Day 15	Lecture 15	ML Model Performance Metrics: Confusion Matrix, Accuracy, Precision, Recall, F1-Score, Positive Rate, False Positive Rate, Case Study using Python for all metrics; Data Visualization: using Matplotlib python library



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ANNEXURE-B

APPLICATION FORM

Name of the Course Applied:

Name:

Father's/Husband's Name:

Date of Birth: Sex: Male Female

Occupation:

Qualification:

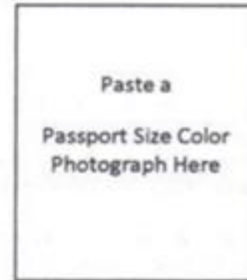
Address.....

.....

..... *E-mail ID:.....

Phone (with STD code): Residence: Mobile:

Aadhar Number :



Fee Details:

Amount: DD No.: Date:.....

Name of Bank.....

(Please write your name and course applied for in the back of the Demand Draft also.)

Date:

Signature of the Applicant

Note:

1. Time/Batch will be allotted as per the convenience of the applicant in general, however candidate may be asked to change the batch as per the requirement of the course.
2. The Fee Deposited for any course is non-refundable & non-transferable.
3. Information regarding the classes will be sent to through mail after registration.
4. If applicant is in Government service, they need to apply through proper channel.

For Office Use Only

Course and Time allotted:

Fee Details:

Place & Date:

Signature of CEC-Chairman



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ACCOUNT DETAILS FOR ONLINE PAYMENT

Bank Name:	State Bank of India
Account Number	38027633250
Account Holder Name	Director NIT Raipur
Branch Name and Address	NIT Branch, G. E. Road Raipur, Chhattisgarh 492010, India
IFSC Code	SBIN0002852
MICR Code	492002004
Swift Code	SBININBB646
PAN Card Number	AAAJN0643G
GSTIN Number	22AAAJN0643G1ZN