

Regression, Decision Trees, Neural Network, Clustering., Random forest to analyse the data

- Identifying a case study (for e.g. weather forecasting, stock market prediction, sentimental analysis, crime prediction, health data analytics etc) for a mini project

Essential/recommended/ suggested readings

- Data Science from Scratch: First principles with Python, Joel Grus, 2nd Edition, O’Rielly Media Inc, 2019. <https://all3dp.com/2/blender-3d-printing-tutorial/>
- Python Data Science Handbook: Essential Tools for working with Data, 2nd Edition, O’Rielly Media Inc, 2022
- Practical Statistics for Data Scientist, Peter Bruce, Andrew Bruce and Peter Gedeck, 2nd Edition, O’Rielly Media Inc, 2020
- Python for Data Science, L.M. John Paul Mueller, Wiley, 2019.

DISCIPLINE SPECIFIC ELECTIVE COURSE -3 (DSE-3)

V. 5.5. Urban Computing

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit-distribution of the course			Eligibility criteria	Prerequisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Urban Computing[#] DSE 3, V.5.5	4	0	0	4	Pass 12 th	Programming languages, data Structure, Algorithm design and analysis

Learning Objectives:

This course introduces an interdisciplinary field, is the science of using computing technology in solving urban challenges such as crowds, traffic, and pollution, governance issues etc. Urban computing research also focuses on acquiring an understanding of the nature of urban phenomena, predict the future of cities, and plan their development.

Learning Outcomes:

- Learn to formulate challenges urban problems.
- Understand ways of data acquisitions, integration, and modeling skills necessary for urban computing research.

- Learn to model cities, develop large-scale statistical models, and use visualization technologies to pose and answer questions.
- Solve issues related to public health, sustainable use of limited energy resources, emergency preparedness, and societal stability etc
- Work in blended project teams with people from a variety of disciplines.
- Understand ways to solve practical hands-on problems faced by urban spaces/cities. activities.

Practicals -

(120 Hours)

The course will be conducted completely on a hands- on mode and project based learning. The basic concepts of Urban Computing will be explained and associated real world challenging problems will be identified.

- Problem solving on Urban context text analytics including Smart mobility and smart environments.
- Acquisition and processing of high resolution remotely sensed data for urban applications;
- Practical work on Location-based service in smart cities
- Experiments on Data acquisition, storage, management, analysis, sharing
- Agent-based simulation for urban dynamics
- Hands on working on Urban sensor network data and applications.
- Students will be exposed to the practical application of Urban Computing concepts and learn how to solve real world urban problems.

Essential/recommended readings

- Zheng, Y. (2019). *Urban computing*. MIT Press.
- Yin, H. (2023). An overview of urban data variety and respective value to urban computing. *Handbook of Mobility Data Mining*, 1-13.
- Haldorai, A., Ramu, A., & Murugan, S. (2019). *Computing and Communication Systems in Urban Development: A Detailed Perspective*. Springer Nature.
- Zheng, Y., Capra, L., Wolfson, O., & Yang, H. (2014). Urban computing: concepts, methodologies, and applications. *ACM Transactions on Intelligent Systems and Technology (TIST)*, 5(3), 1-55.

DISCIPLINE SPECIFIC ELECTIVE COURSE -3 (DSE-3)
V. 5.6. IT Project Leadership

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit-distribution of the course			Eligibility criteria	Prerequisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		