

<b>CSAI 3107</b>	<b>Pattern Recognition and Anomaly Detection Lab</b>	L	T	P	C
<b>Version 1.0</b>		0	0	2	1
<b>Pre-requisites/Exposure</b>	Basic programming skills in python, artificial intelligence and machine learning				
<b>Co-requisites</b>	--				

## Course Objectives

1. To gain knowledge on the process of Pattern Recognition and anomaly detection.
2. To learn about the implementation of pattern and anomaly detection.
3. To understand the analysis and validation of models over the datasets.

## Course Outcomes

At the end of this course student should be able

- **CO1:** Understand the concept of a pattern and the basic approach to the development of pattern recognition and machine intelligence algorithms.
- **CO2:** Analyze the statistical approaches corresponding to pattern recognition.
- **CO3:** Comprehend the contemporary techniques in machine learning for pattern recognition
- **CO4:** Understand and apply both supervised and unsupervised classification methods to detect and characterize patterns in real-world data
- **CO5:** Apply pattern recognition techniques to real-world problems such as document analysis and recognition.

## Catalog Description

Pattern and anomaly detection, course provides with a working knowledge of methods for design and analysis of AI based techniques for pattern and anomaly detection. Particular attention is given to modeling dynamic systems, measuring and controlling model behavior, and making decisions about pattern and anomaly detection. The content is necessarily broad, and the course level is introductory. The intent is to motivate and prepare students to conduct research projects and for further study through advanced courses in related areas.

### List of Experiments:

S. No	Lab Exercises	Contents
1.	Experiment No 1	Installing Anaconda and setup up environment
2.	Experiment No 2	Using pandas and numpy
3.	Experiment No 3	Linear Regression
4.	Experiment No 4	Logistic Regression
5.	Experiment No 5	Polynomial Regression
6.	Experiment No 6	Support Vector Machines
7.	Experiment No 7	Local Outlier Factors
8.	Experiment No 8	Decision Trees
9.	Experiment No 9	Random Forests
10.	Experiment No 10	Isolated Random Forest
11.	Experiment No 11	Principal Component Analysis
12.	Experiment No 12	Density-based spatial clustering

### TEXT BOOKS:

- T1. Book provided by IBM- Data Mining & Prediction Modelling (Course code GAI06SG1 V1.0)

### REFERENCES:

- Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig, c 1995 Prentice-Hall, Inc.

**Continuous Evaluation-** There will be continuous evaluation for all practical subjects of SoCS during the semester w.e.f. January 2016. The performance of a student in a Practical subject will be evaluated as per process given below:

No. of Labs Sessions planned	No. of Viva planned
10	2

One Session = 120 minutes

Students are continuously evaluated through the proceedings of the course based on the following:

- 1) Performance & Record (50%)
- 2) Viva Voce or Quiz (50%)

**Relationship between the Program Outcomes (POs), Course Outcomes (COs) and Program Specific Outcomes (PSOs):**

Course Outcomes	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
CO1	1	1	1										2		3
CO2	1	1	1	2	3								2		2
CO3	1	1	1	2	3								2		3
Average	1	1	1	2	3								2		2.67

1=Weak

2= Moderate

3= Strong