# Rayat Shikshan Sanstha's KARMAVEER BHAURAO PATIL COLLEGE, VASHI. NAVI MUMBAI (Autonomous) Department of Data Science M. Sc. Data Science

**Program Outcomes (POs)** 

Learners are able to-

PO-1	Disciplinary Knowledge	Acquire the comprehensive and in-depth knowledge of various subjects in sciences such as Physics, Chemistry, Mathematics, Microbiology, Bio- analytical Science, Computer Science, Data Science, Information Technology and disciplinary skills and ability to apply these skills in the field of science, technology and its allied branches
PO-2	Communication and Presentation Skills	Develop various communication skills including presentation to express ideas evidently to achieve common goals of the organization.
PO-3	Creativity and Critical Judgment	Facilitate solutions to current issues based on investigations, evaluation and justification using evidence based approach.
PO-4	Analytical Reasoning and Problem Solving	Build critical and analytical attitude in handling the problems and situations.
PO-5	Sense of Inquiry	Curiously raise relevant questions based on highly developed ideas, scientific theories and its applications including research.
PO-6	Use of Digital Technologies	Use various digital technologies to explore information/data for business, scientific research and related purposes.
PO-7	Research Skills	Construct, collect, investigate, evaluate and interpret information/data relevant to science and technology to adapt, evolve and shape the future.
PO-8	Application of Knowledge	Develop a scientific outlook to create consciousness against the social myths and blind faith.
PO-9	Moral and Ethical Reasoning	Imbibe ethical, moral and social values to develop virtues such as justice, generosity and charity as beneficial to individuals and society at large.
PO-10	Leadership and Teamwork	Work cooperatively and lead proactively to achieve the goals of the organization by implementing the plans and projects in various field-based situations related to science, technology and society at large.
PO-11	Environment and Sustainability	Create social awareness about the environment and develop sustainability for betterment of the future.

PO-12	Lifelon	g Learn	ing I	Realize with d succes	that pur etermin sful life	suit of k ed effo	tnowled rts, pos	ge is a l itive att	ifelong itude ar	activity nd other	and in co qualitie	ombinatio s to lead	
				Depa	artme Prog Out	nt of D gram S comes	ata So pecific (PSO)	<b>eience</b>					
<ul> <li>PSO-1 Understand the various processes involved in application development in the context of Data science.</li> <li>PSO-2 Develop realistic solutions to meet the requirements of the society and the industry using the convirt data evaluation ability.</li> </ul>													
acquired data analytics skills													
Course C CO-1 Datab CO-2 CO-3 CO-4 Famil ICT 7 Stude (Exper Links 1)https 2) http	Dutcom : Recall bases & :Descri : Illustr : Expla ly stores Fools U ents Ce imental, : SWA :://nptel.a :://online	es: Afte l the cor Relation be the C ate the I in Data (Cassar (Cassar Sed: V Participa (YAM) c.in/cou	PG r succes ncept of nal Alge Object D NOSQL Modelin ndra). 7ideos, 1ethods ative, Pro- rses/106 .swayam	DS101 sful cor Database bra. vatabase concep ng With PPT, II s:_Probl blem So CS: /106/106 2.ac.in/c The (	Advan npletion se Syster t with th Graph RIS,Mc em Solv blving) 5106093/ ec19_cs CO-PC	n of this ems, Rel ns ,Desi he NOS (NEeo4 ongoDE ing and <u>05/previ</u> <b>D Map</b>	atabas course, ational ign the l QL data j), Key- Participa ew ping N	e Tech student Databas E-R mo ibase. Value I value I	nologie is will b ses ,Stru del ,Nor Database	e able to acture of rmalizati es (Riak)	: Relatior on proce	nal ess. n-	
CO\P O	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	
CO1	3	1	2	1	1	-	-	-	-	-	-	-	
CO2	2	2	-	2	-	-	-	-	-	-	-	-	
CO3	2	1	2	1	-	-	-	-	-	-	-	-	
CO4	2	2	-	2	-	-	-	-	-	-	-	-	

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1:** Describe the data and its properties by use of central tendency and variability.

**CO2:** Explain the concepts of probability and its distributions.

**CO3**: Apply sampling distributions to contribute to the process of making rational decisions in analytical problems

**CO4:** Analyze the relationship between two quantitative variables using Correlation and Regression **ICT Tools Used:** Videos, PPT, Pen-Tablet, Chalk duster

Students Centric Methods:\_Problem Solving and Participative

(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <u>https://nptel.ac.in/courses/111/106/111106112/</u>

- 2) <u>https://nptel.ac.in/courses/111/105/111105090/</u>
- 3) https://nptel.ac.in/courses/111/104/111104120/

	The CO-PO Mapping Matrix													
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1	1	-	-	1	-	-	-	2	-	-	-	-		
CO2	1	-	-	1	-	-	-	2	-	-	-	-		
CO3	-	-	-	-	-	-	-	-	-	-	-	-		
CO4	-	-	-	-	-	-	-	-	-	-	-	-		

## PGDS103 Applied Linear Algebra

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1**: Describe the concept of characteristic polynomial, eigenvalues and eigenvectors.

**CO2:** Recognize and use equivalent forms to identify matrices and solve linear systems of equations.

**CO3:** Explain how orthogonal projections relate to least square approximations.

**CO4:** Acquire the knowledge of various concepts in Applied Algebra.

**CO5:** Employ Python to perform various matrix and vector computations.

**ICT Tools Used:** Videos, PPT, Chalk Board

Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

- 1. <u>Matrix Analysis with Applications Course</u>
- 2. <u>Linear Algebra Course</u>

	The CO-PO Mapping Matrix														
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1	1	-	-	1	-	-	-	-	-	-	-	-			
CO2	3	-	-	2	-	1	-	-	-	-	-	-			
CO3	1	-	-	1	-	-	-	-	-	-	-	-			

CO4	2	-	-	2	-	-	-	-	-	-	-	-
CO5	1	-	-	1	-	3	-	-	-	_	_	_

Course O CO1: CO2: frame, CO3: CO4: ICT T Studer (Experi Links	utcome Explain Differe factor, Collect Visualiz Cools Us nts Cer mental, I SWA	es: After basic p ntiate bo date and detailed ze your sed: V ntric M Participa YAM /	PGI success rogrami etween o l time o l inform data usi ideos, I ideos, I fethods tive, Pro	osful con ming lau differen bject ation ra ng base PPT, R <u>PPT, R</u>	Data V npletion nguage o t R data w data u R grapl studio, em Solvi lving)	isualiz of this concept a structu using R hics CSV ng and F	ation u course, s using i res sucl profiler Participat	students R h as: str	s will be	able to: nber, ve	ctor, ma	trix, data	
<ul> <li>Links: SWAYAM / MOOCS:</li> <li>1) <u>https://www.coursera.org/learn/r-programming</u></li> <li>2) https://www.udemy.com/course/data-visualization-in-r-base-lattice-ggplot/</li> </ul>													
				The C	С <u>О-РС</u>	) <u>Map</u>	ping N	<u>latrix</u>					
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	1	-	-	1	-	-	-	-	-	-	-	-	
CO2	3	-	-	1	-	1	-	-	-	-	-	-	
CO3	1	-	-	1	-	-	-	-	-	-	-	-	
CO4	2	-	-	2	-	-	-	-	-	-	-	-	

#### PGDS105 Data Warehousing & Mining

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1:** Explain the operational and decision support system.

**CO2:** Evaluate the impact of use and information using knowledge discovery in databases and KDD process models.

**CO3:** Summarize the data mining concepts with the help of Apriori algorithm, lift conviction and trees.

**CO4:** Construct data models and prototypes needed to gain stakeholder support to achieve business objectives.

ICT Tools Used: Videos, PPT, Chalk Board, Iris, Weka

**Students Centric Methods:** Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) https://www.coursera.org/specializations/data-warehousing

2) https://www.udemy.com/course/data-warehouse-fundamentals-for-beginners/

3) <u>https</u>	3) <u>https://onlinecourses.nptel.ac.in/noc20_cs12/preview</u>													
	The CO-PO Mapping Matrix													
CO\PO PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12														
CO1	1	-	-	-	-	-	1	-	-	-	-	-		
CO2	-	-	-	-	-	1	2	-	-	-	-	-		
CO3	-	-	-	1	1	-	1	-	-	-	-	-		
CO4	-	-	-	-	-	-	2	-	-	-	-	-		

### **PGDS106 Data Structure with Python**

**Course Outcomes:** After successful completion of this course, students will be able to:

CO1: Recall the concepts of arrays, strings and algorithms for basic operations.

**CO2:** Recognize the concept of stacks, queues, linked list and algorithms for basic operations.

**CO3:** Identify the familiarity with major algorithms and data structures

**CO4:** Analyze appropriate algorithms and data structures for various applications

**CO5:** Formulate the computational complexity of various algorithms

## **ICT Tools Used:** Videos, PPT, Chalk Board

Students Centric Methods:\_Problem Solving and Participative

(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) https://nptel.ac.in/courses/106/106/106106145/

2) <u>https://www.udemy.com/course/data-structures-and-algorithms-bootcamp-in-python/</u>

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	1	-	-	-	-	-	-	-	-
CO2	3	-	-	1	-	1	-	-	-	-	-	-
CO3	1	-	-	1	-	-	-	-	-	-	-	-
CO4	2	-	-	2	-	-	-	-	-	-	-	-

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The CO-PO Mapping Matrix													
CO\PO	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	1	-	-	2	-	-	-	-	-	-	-	-	
CO2	-	-	1	-	2	-	-	-	-	-	-	-	
CO3	-	-	1	-	-	2	2	-	-	-	-	-	
CO4	-	-	-	-	-	-	1	-	-	2	-	-	

## **PGDS202 Optimization Techniques**

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1:** Explain the theory of optimization methods and algorithms.

**CO2:** Apply the mathematical results and numerical techniques of optimization theory to concrete data science problems.

**CO3:** Apply basic concepts of mathematics to formulate an optimization problem.

**CO4:** Analyze and appreciate a variety of performance measures for various optimization problems. **ICT Tools Used:** Videos, PPT, Chalk Board

Students Centric Methods: Problem Solving and Participative

(Experimental, Participative, Problem Solving)

### Links: SWAYAM / MOOCS:

1) <u>https://www.coursera.org/learn/operations-research-modeling</u>

2) https://nptel.ac.in/courses/111/105/111105039/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	1	-	-	-	-	-	-	-	-
CO3	-	2	-	-	-	-	-	1	-	-	-	-

<b>CO4</b> 2	-
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PGDS203 Statistical Inference															
Course Outcomes: After successful completion of this course, students will be able to: CO1: Recognize several basic types of statistical problems corresponding to various sampling															
<b>CO1:</b>	<b>CO1:</b> Recognize several basic types of statistical problems corresponding to various sampling designs.														
design	s.														
<b>CO2:</b>	<b>CO2:</b> Define null hypothesis, alternative hypothesis, level of significance, test statistic, p value, and statistical significance.														
statistical significance.															
<b>CO3:</b> Describe the statistical decision-making theory and interpretation.															
<b>CO4:</b> Demonstrate knowledge of the main properties of AR(1),AR(2), ARIMA models															
<b>CO5:</b> Demonstrate computational skills to implement various statistical inferential approaches.															
ICT Tools Used: Videos, PPT, Chalk Board															
Students Centric Methods:_Problem Solving and Participative															
(Experimental, Participative, Problem Solving)															
(Experimental, Participative, Problem Solving) Links: SWAYAM / MOOCS:															
1) <u>htt</u>	Links: SWAYAM / MOOCS: 1) https://nptel.ac.in/courses/111/104/111104146/														
2) <u>htt</u>	ps://npte	1.ac.in/co	ourses/12	11/102/1	1110211	2/									
				The C	С <b>О-РС</b>	) Map	ping N	<u>latrix</u>							
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1	2	-	-	-	-	-	-	-	-	-	-	-			
CO2	-	2	-	1	-	-	-	-	-	-	-	-			
CO3	-	2	-	-	-	-	-	1	-	-	-	-			
<b>CO4</b>	-	-	2	-	-	-	-	-	-	-	-	-			

PGDS204 Advanced Python Programming

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1:** Explain fundamental understanding of the Python programming language.

**CO2:** Describe common Python functionality and features used for data science

CO3: Illustrate the Object-oriented Programming concepts in Python.

**CO4:** Visualize and describe DataFrame structures for cleaning and processing data

**ICT Tools Used:** Videos, PPT, Pen-Tablet, CSV, Python

**Students Centric Methods:** Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <u>https://www.udemy.com/course/python-programming-basics-multithreading-oop/</u>

2) <u>https://www.coursera.org/learn/python-data-analysis#about</u>

				The C	С <b>О-РС</b>	) Map	ping N	<u>latrix</u>				
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	-	-	-	-	-	-	-
CO2	2	2	-	2	-	-	-	-	-	-	-	-
CO3	2	1	2	1	-	-	-	-	-	-	-	-
CO4	2	2	-	2	-	-	-	-	-	-	-	-

### PGDS205 Big Data Analytics

Course Outcomes: After successful completion of this course, students will be able to:

- **CO1:** Describe the fundamentals of various big data analytics techniques.
- **CO2:** Design efficient algorithms for mining the data from large volumes.
- CO3: Analyze the HADOOP and Map Reduce technologies associated with big data analytics.
- **CO4:** Prepare a complete business data analytics solution

ICT Tools Used: Videos, PPT, Chalk Board

Students Centric Methods: Problem Solving and Participative

(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <u>https://www.greatlearning.in/academy/learn-for-free/courses/mastering-big-data-analytics</u>

2) <u>https://www.coursera.org/learn/getting-started-with-data-warehousing-and-bi-analytics</u>

3) <u>https://www.coursera.org/learn/introduction-to-big-data-with-spark-hadoop</u>

## **The CO-PO Mapping Matrix**

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	-	1	-	-	-	-	-	-	-	-
CO3	-	-	-	-	2	1	2	1	-	-	-	-
CO4	-	-	2	-	-	-	-	2	-	2	-	-

## **PGDS206 Analysis of Algorithm**

Course Outcomes: After successful completion of this course, students will be able to:

**CO1:** Explain the concepts of algorithms for designing good program

CO2: Implement algorithms using Python

**CO3:** Determine how to transform new problems into algorithmic problems with efficient solutions **CO4:** Illustrate algorithm design techniques for solving different problems

**ICT Tools Used:** Videos, PPT, Chalk Board

Experi	Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)														
Links	Links: SWAYAM / MOOCS: 1) https://mptal.ac.in/courses/106/106106131/														
<ol> <li><u>https://nptel.ac.in/courses/106/106/106106131/</u></li> <li><u>https://www.coursera.org/learn/analysis-of-algorithms</u></li> </ol>															
3) <u>https://www.udemy.com/course/design-and-analysis-of-algorithm-/</u>															
The CO-PO Mapping Matrix															
CO\PO	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12														
CO1	2	-	-	-	-	-	-	-	-	-	-	-			
CO2	2	-	-	1	-	-	-	-	-	-	-	-			
CO3	-	-	-	-	2	1	2	1	-	-	-	-			
CO4	-	-	2	-	-	-	-	2	-	2	-	-			

#### PGDS301 Machine Learning Course Outcomes: After successful completion of this course, students will be able to: CO1: Explain real-world applications that needs machine learning based solutions

**CO2:** Implement and apply machine learning algorithms

**CO3:**Recognize the characteristics of machine learning techniques that are useful to solve real-world problems

#### **CO4:**

ICT Tools Used: Videos, PPT, Chalk Board

### Students Centric Methods:\_Problem Solving and Participative

(Experimental, Participative, Problem Solving)

### Links: SWAYAM / MOOCS:

- 1) <u>https://www.simplilearn.com/free-course-on-machine-learning-with-r-skillup?tag=machine%20learning</u>
- 2) https://www.simplilearn.com/learn-machine-learning-basics-skillup

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
CO1	2	-	1	1	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	2	2	-	-	-	-
CO3	3	-	1	1	-	-	2	2	-	-	-	-
<b>CO4</b>	-	-	-	-	-	-	-	-	-	-	-	-

Course O CO1: CO2: CO3: CO4: ICT T Studer (Experi Links 1) htt 2) htt 3) http	Describ Solve p Compar Use exp Cools Us Cools Cools Us Cools Cools	es: After roblems re variou pert syst sed: V htric M Participa YAM / w.simplif v.courser	success ent type s using i us Knov em tool ideos, I ideos, I <u>ethods</u> tive, Pro <u>MOO</u> learn.cor ra.org/lea a.org/spe	Ful con s of pro nformed vledge I s to real PPT, Cl : Proble blem So CS: n/learn-a arn/intro ecializati	GDS3 ppletion blem-so d and ur Represen ize the o nalk Bo em Solvi lving) ui-basics- duction- ons/ai-fo	<b>D2</b> Arti of this olving ag informentation l concepts oard ng and F -skillup? to-ai oundatio	ficial In course, gents an ed searc Logic us s and co Participat 'term=art	ntellige students d its app h strateg sing scri omponer ive ive	will be plication gies. pts and nts of ex	able to: ns frames. pert syst	tem			
	The CO-PO Mapping Matrix													
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1	2	-	1	1	-	-	-	-	-	-	-	-		
CO2	-	-	-	-	-	-	2	2	-	-	-	-		
CO3	3	-	1	1	-	-	2	2	-	-	-	-		
CO4	-	-	-	2	-	-	-	2	-	-	-	-		

PGDS301 Natural Language Processing													
ourse Outcomes: After successful completion of this course, students will be able to:													
<b>CO1:</b> Describe the basics of Natural language processing.													
<b>CO2:</b> Analyze the text syntactically.													
<b>CO3:</b> Analyze the text content Semantically.													
<b>CO4:</b> Implement recurrent network for language models.													
ICT Tools Used: Videos, PPT, Chalk Board													
Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)													
(Experimental, Participative, Problem Solving) Links: SWAYAM / MOOCS:													
1) https://courses.analyticsvidhya.com/courses/Intro-to-NLP													
2) https://www.coursera.org/specializations/natural-language-processing													
The CO-PO Mapping Matrix													
CO\PO PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12													
<b>CO1</b> 2 - 1 1													

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CO2	-	-	-	-	-	-	2	2	-	-	-	-
CO3	3	-	1	1	-	-	2	2	-	-	-	-
CO4	-	-	-	2	-	-	-	2	-	-	-	-

### PGDS304 Data Handling and Visualization

Course Outcomes: After successful completion of this course, students will be able to:

**CO1:** Explain the concepts of algorithms for designing good program

CO2: Implement algorithms using Python

**CO3:** Determine how to transform new problems into algorithmic problems with efficient solutions

**CO4:** Illustrate algorithm design techniques for solving different problems

**ICT Tools Used:** Videos, PPT, Chalk Board

Students Centric Methods: Problem Solving and Participative

(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) https://alison.com/course/introduction-to-data-visualization

2) https://alison.com/course/python-and-matplotlib-data-visualization

### **The CO-PO Mapping Matrix**

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-

PGDS304 Case Studies in Data Science

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1:** Explain the concepts of algorithms for designing good program

**CO2:** Implement algorithms using Python

**CO3:** Determine how to transform new problems into algorithmic problems with efficient solutions **CO4:** Illustrate algorithm design techniques for solving different problems

**ICT Tools Used:** Videos, PPT, Chalk Board

Students Centric Methods:\_Problem Solving and Participative

(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) https://alison.com/courses/advanced-excel-2021/content#event=login

2)https://www.coursera.org/specializations/excel-data-analytics-

visualization?action=enroll

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>CO1</b>	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-

PGDS401 Deen Learning														
Cour CO1: CO2: CO3: CO4: ICT T	rse Oute Design Implem Develop	comes: simple l ent Con p an app sed: V	After su Neural I volution lication ideos, I	Iccessfu Network nal Neu based o PPT, Cl	PGD I compl as using ral Netv on Recu nalk Bo	S401 I etion of Linear vorks us rrent Ne pard	Deep Lo this cou Perceptu sing Ten eural Ne	earning arse, stu ron. asorFlov etwork.	dents w	ill be ab	le to:			
Students Centric Methods:       Problem Solving and Participative         (Experimental, Participative, Problem Solving)       Links: SWAYAM / MOOCS:         1) https://www.coursera.org/specializations/deep-learning       2) https://www.coursera.org/learn/introduction-to-deep-learning-boulder														
	The CO-PO Mapping Matrix													
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12		
CO1	-	-	-	-	-	-	-	-	-	-	-	-		
CO2	-	-	-	-	-	-	-	-	-	-	-	-		
CO3	CO3													
CO4	-	-	-	-	-	-	-	-	-	-	-	-		

## PGDS404 Data Visualization in Tableau

**Course Outcomes:** After successful completion of this course, students will be able to: **CO1:** Understand types of data and data visualization methods **CO2:** Understand the need of data visualization.

**CO3:** Create and design visualizations and dashboards

**CO4:** Evaluate the performance of visualization technique

**ICT Tools Used:** Videos, PPT, Chalk Board

**Students Centric Methods:** Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS: 1) https://www.coursera.org/projects/tableau-public-interactive-graph 2) https://www.coursera.org/projects/get-started-tableau <u>The CO-PO Mapping Matrix</u>															
CO\PO	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12														
CO1															
CO2	-	-	-	-	-	-	-	-	-	-	-	-			
CO3	-	-	-	-	-	-	-	-	-	-	-	-			
<b>CO4</b>	-	-	-	-	-	-	-	-	-	-	-	-			

PGDS405B Cloud Computing

Course Outcomes: After successful completion of this course, students will be able to: CO1: Describe the concepts of Cloud Computing and its Service Models & Deployment Models CO2: Classify the types of Virtualization CO3: Describe cloud security CO4:

**ICT Tools Used:** Videos, PPT, Chalk Board

**Students Centric Methods:** Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) https://www.udacity.com/course/intro-to-cloud-computing--ud080

2) https://www.simplilearn.com/learn-cloud-security-basics-skillup?term=cloud

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-