

D. Y. PATIL TECHNICAL CAMPUS

Faculty of Engineering and Faculty of Management, Talsande

Department of Computer Science & Engineering

Academic Year-2022-23

Semester-VIII

Class:-BTech

Div:- -

Course- Big Data Analytics (PCC- CS801)

Name of Faculty-Mr. B. S. Jadhav

Institute Vision:

To become leading technical campus in providing high quality technical and management education equipped with professional ethics and values to serve the society.

Institute Mission:

- To Skilled technical and managerial work force with high ethical values.
- To promote use of latest teaching aids to excel in academics and research.
- To install lifelong learning and respect for the environment.

Vision of Department:

To impart computer science and engineering knowledge in engineers to serve services in government or private sector and also support building career as entrepreneur.

Mission of Department:

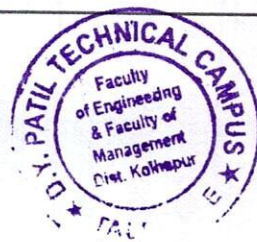
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|---|---|
| 1 | To provide outcome based academic environment for developing skilled professionals. |
| 2 | To create platform to overcome gap between Industry expectation skills and education. |
| 3 | To enhancing knowledge using value added courses for promoting their careers. |

Programme Educational Objectives (PEOs):

- | | |
|---|--|
| 1 | To tackle real life problems & provide more affordable & economic solution. |
| 2 | Able to take up higher studies, research & development & entrepreneurship in modern computer environment |
| 3 | Students should be able to face government & PSO's examination. |

Programme Outcomes (POs)

- PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO 2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.



PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSOs)

1	To tackle real life problems & provide more affordable & economic solution.
2	Able to take up higher studies, research & development & entrepreneurship in modern computer environment

PEOs Mapping

PEO	Program Outcomes												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	2			2		3	2			2	3	3	3
2	2	3	3	3	2	3	2	2			2	2	3	3
3			2		2	3	3	3	3	3	3	2	3	3



D. Y. PATIL TECHNICAL CAMPUS, Talsande
Department of Computer Science & Engineering

SHIVAJI UNIVERSITY, KOLHAPUR
B. Tech. (Computer Science & Engineering) Semester VIII(AY 2022-23)
BIG DATA ANALYTICS

Teaching Scheme:

Lectures: 4 Hrs/ Week
 Practical: 2Hr/ Week

Examination Scheme:

Theory Paper: 70 Marks (ESE Exam)
 CIE - 30 Marks
 Term Work: 25 Marks
 POE: 50 Marks

Course Objectives:

The course aims to:

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.
2. Acquire clear understanding of R & Hadoop.
3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its
4. Manage Big Data and analyze Big Data.
5. Apply tools and techniques to analyze Big Data.

Course Outcomes:

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

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.
2. Acquire clear understanding of R & Hadoop.
3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.
4. Manage Big Data and analyze Big Data.
5. Apply tools and techniques to analyze Big Data.



Course-Big Data Analytics (PCC- CS801)		CO Statement	
CS801.1	Upon successful completion of this course, the student will be able to: Analyze several key technologies used in manipulating, storing, and analyzing big data.	Blomms Level BL-4 Analyze	
CS801.2	Acquire clear understanding of R & Hadoop.	BL-2 Understand	
CS801.3	Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.	BL-2 Understand	
CS801.4	Manage Big Data and analyze Big Data.	BL-4 Analyze	
CS801.5	Apply tools and techniques to analyze Big Data.	BL-3 Apply	

Note: following justification example includes 4 criteria for CO-PO mapping
CO-PO Mapping Justification

Total Lecture Hrs	48
Total Practical Hrs	40
Total Contact Hrs	88

Criteria 1 (Contact hrs)

CO	Contact hrs(L)	Contact hrs(P)	Total Contact hrs	% Contact hrs	Level (for CO)
CS801.1	8	4	12	14	1
CS801.2	8	8	16	18	2
CS801.3	8	8	16	18	2
CS801.4	16	16	32	36	3
CS801.5	8	20	28	32	3
Total	48	40	88	100	

Criteria 3 (Rubrics for PO10)

PO	Level (for PO)	PO10
No. categories for analysis =		2
		2

Criteria 4 (Keyword)

CO	Keyword used	PO Level (for mapping)	PO Level (for mapping)	PO Level (for mapping)
CS801.1	Analyze	1,2	3	3
CS801.2	Understand	1,2	3	3
CS801.3	Understand	1,2	3	3
CS801.4	Analyze	1,2	3	3
CS801.5	Apply	3	3	2,1,0

CO	Keyword used	PSO Level (for mapping)
CS801.1	Analyze	1
CS801.2	Understand	1
CS801.3	Understand	1
CS801.4	Analyze	1,2
CS801.5	Apply	1,2

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CS801.1	2	2	2										2	
CS801.2	3	3	3										2	
CS801.3	3	3	3										2	
CS801.4	3	3	2										3	3
CS801.5	3	3	3						2				3	3
CS801	2.75	2.80	2.33						2.00				2.40	5.00

Target Setting For Attainment

Sr.No.	Academic Year	% Result	Avg. Marks	Average Result	Average Marks
1	2021-22	100.00	70.00	100.00	63.84
2	2020-21	100.00	62.53	100.00	
3	2019-20	100.00	59.00	100.00	

Target Marks

Attainment Levels

Level 1	50%	students will score more than 64 % marks
Level 2	60%	students will score more than 64 % marks
Level 3	70%	students will score more than 64 % marks

Criteria 2 (Assessment Tools)

Assessment Tools	CIE (MT/ET)	CIA/Cont Internal Assessment	CE (Course Exit Survey)	ESE (UE-Exit Survey)	ESE (POE)	No of Tools	Level (for PO)
PO1	Y	Y	Y	Y	Y	5	3
PO2	Y	Y	Y	Y	Y	5	3
PO3	Y	Y	Y	Y	Y	5	3
PO4							
PO5							
PO6							
PO7							
PO8							
PO9							
PO10							
PO11							
PO12							
PSO1	Y	Y	Y	Y	Y	2	2
PSO2	Y	Y	Y	Y	Y	2	2

CO	PO	Criteria			Final Mapping → Average of all levels (Rounded up)
		Contact hr (for CO)	Assess. Tools (for PO)	Rubric (for PO)	
1	1	1	3	3	2
1	2	1	3	3	2
1	3	1	3	3	2
2	1	2	3	3	3
2	2	2	3	3	3
3	1	2	3	3	3
3	2	2	3	3	3
4	1	2	3	3	3
4	2	2	3	3	3
4	3	2	3	3	2
5	2	3	3	3	3
5	3	3	3	3	3
5	10	3	2	2	2

CO	PSO	Criteria			Final Mapping → Average of all levels (Rounded up)
		Contact hr (for CO)	Assess. Tools (for PSO)	Rubric (for PSO)	
1	1	1	2	2	2
2	1	2	2	2	2
3	1	2	2	2	2
4	1	2	2	2	2
4	2	2	2	2	2
5	1	3	2	2	3
5	2	3	2	2	3



D. Y. PATIL TECHNICAL CAMPUS, Talsande
Department of Computer Science & Engineering

A.Y	2022-22	8Tech	Div
course code	PCC- CS801	Big Data Analytics	

CO	PO	CO-PO/PSO Mapping										PSO			
		1	2	3	4	5	6	7	8	9	10		11	12	
CS801.1	1													1	2
CS801.2	2													2	
CS801.3	3													2	
CS801.4	3													2	
CS801.5	3													3	3
PCC- CS801	2.75	2.8	2.333							2	2			2.4	3

MT	MID TERM EXAM
ET	END TERM EXAM
CT	CLASS TEST
AS	ASSIGNMENT
PR	PRACTICAL
VISIT	FIELD VISIT
GL	GUEST LECTURE
WR	WORKSHOP
T1, T2	TASK 1, 2
CE	COURSE EXIT SURVEY
UE	UNIVERSITY THEORY EXAM
OE/POE	UNI. ORAL EXAM
FD1, FD2	EXT. FEEDBACK 1, 2

CO Assessment tools

CO	INTERNAL (65)					EXTERNAL (35)				
	MT	ET	TW	UE	POE	TW	UE	POE	POE	
Weightages	17%					29%				
CS801.1	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CS801.2	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CS801.3	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CS801.4	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CS801.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Tool	Weightages	Assessment Type
MT	17%	Internal Assessment(IA)
ET	14%	
TW	40%	External Assessment(EA)
UE	29%	
POE		

Level	Attainment levels	
	marks	marks
Level 1	50% students will score more than	64% marks
Level 2	60% students will score more than	64% marks
Level 3	70% students will score more than	64% marks

A.Y	Results	Avg. Student Marks
2021-22	100.00	70.00
2020-21	100.00	62.53
2019-20	100.00	59.00
Avg.	100.00	63.84

CO	Statements
CS801.1	Analyze several key technologies used in manipulating, storing, and analyzing big data.
CS801.2	Acquire clear understanding of R & Hadoop.
CS801.3	Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its
CS801.4	Manage Big Data and analyze Big Data
CS801.5	Apply tools and techniques to analyze Big Data.



**PO 10:- Communication
(For Design Case Study and Report)**

Category No	Category	Level of Performance		
		4 to 5	2 to 3	1
1	Detail Design Description	1. Clear explanation of major key points of project 2. Clear interpretation of data.	1. Good explanation of most key points of project parameters 2. Good Interpretation of data	1. Unclear explanation of key points of project parameter 2. Unclear interpretation of data
2	Writing Practices	1. Outstanding and well edited document 2. Clearly mentioned sources applied	1. Good and clear document. 2. Partly mentioned sources applied	1. Unclear document writing. 2. Sources applied are rarely mentioned.



Course :- Big Data Analytics (CS801)										
Assessment Tools	CIE							UE	UE	CIA
	MT			ET				POE		TW
CO Mapped	CS801.1	CS801.2	CS801.3	CS801.2	CS801.3	CS801.4	CS801.5	ALL CO	ALL CO	ALL CO
Maximum marks	14	6	10	6	14	4	6	50	70	25
TARGET	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%
Target(threshold) marks	8.96	3.84	6.4	3.84	8.96	2.56	3.84	32	44.8	16
Final target	9	4	6	4	9	3	4	32	45	16
No of Students appered for CO	28	28	28	28	28	28	28	28	28	28
No. of Students > target	28	28	28	28	28	28	28	28	17	28
% Students > target	100%	100%	100%	100%	100%	100%	100%	100%	61%	100%
Attainment	3	3	3	3	3	3	3	3	2	3
1	12	4	10	6	14	4	6	40	50	20
2	10	6	10	6	14	4	4	40	28	20
3	12	4	8	6	14	4	6	46	52	22
4	12	6	10	6	12	4	4	46	49	24
5	10	6	10	6	14	4	6	45	48	22
6	12	4	8	6	14	4	6	48	53	24
7	12	6	10	6	14	4	4	48	43	24
8	12	6	8	6	14	4	6	48	57	24
9	10	6	10	6	12	4	6	45	36	22
10	12	4	10	6	14	4	4	48	60	24
11	12	6	8	6	14	4	6	46	42	22
12	12	4	10	6	14	4	6	48	38	24
13	10	6	10	6	12	4	4	47	52	24
14	12	4	8	6	14	4	6	48	45	24
15	12	6	10	6	14	4	6	47	46	24
16	10	6	10	6	14	4	4	47	48	24
17	12	6	8	6	14	4	6	49	53	25
18	12	4	10	6	12	4	6	46	41	22
19	12	6	8	4	14	4	4	47	53	24
20	12	4	10	4	14	4	6	49	52	25
21	12	6	8	4	14	4	6	47	40	23
22	10	4	10	4	14	4	6	48	41	24
23	12	6	8	4	12	4	4	49	56	25
24	12	4	10	4	14	4	6	48	40	24
25	12	6	8	4	14	4	6	47	47	23
26	12	6	8	4	14	4	4	48	44	24
27	10	4	10	4	12	4	6	42	43	22
28	12	6	8	6	14	4	6	42	47	21



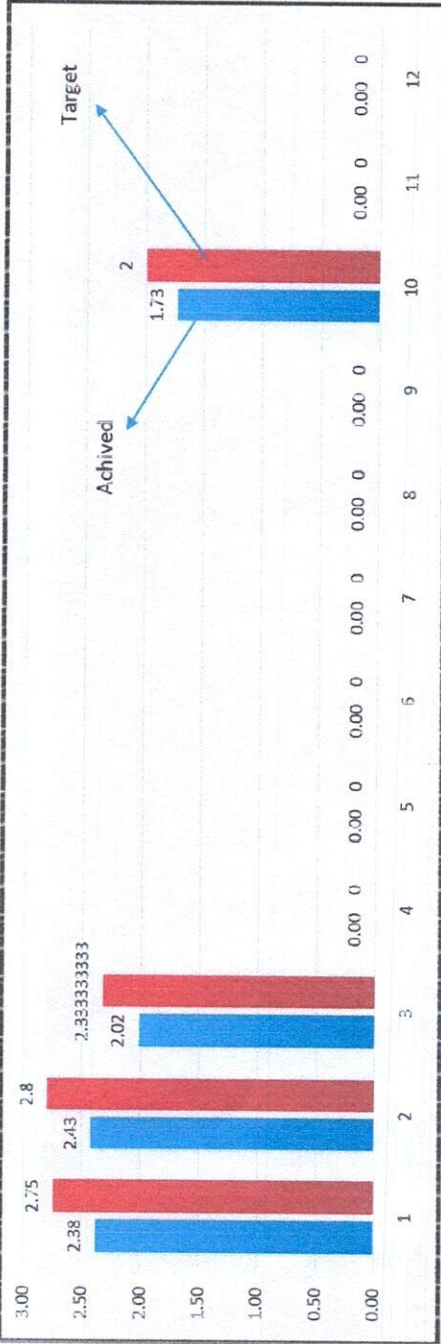
CIE	MT		ET	
	CS801.1	CS801.2	CS801.3	CS801.4
CO	3	3	3	3
Attainment	100%	100%	100%	100%

UE	TW(CIA)		POE	
	ALL CO	ALL CO	ALL CO	ALL CO
2	3	3	3	3
61%	100%	100%	100%	100%

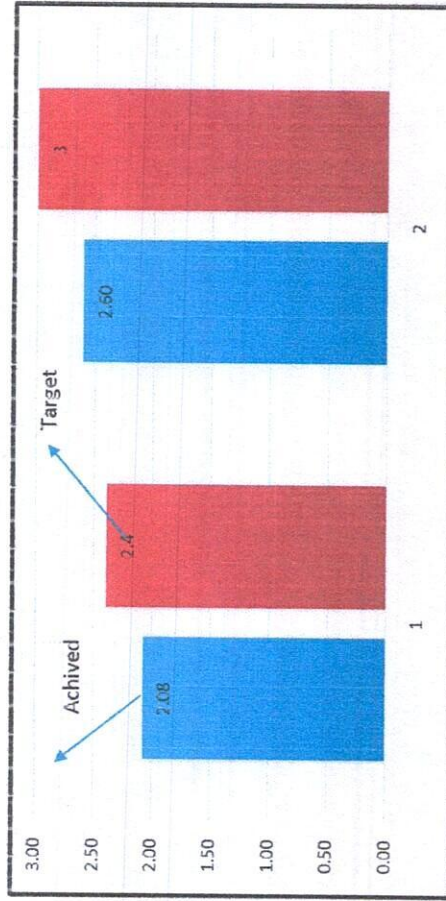
CO	INTERNAL (31%)					External (69%)			Final CO Attainment
	MT	ET	TW	Internal Assessment IA	UE	POE	External Assessment EA		
Weights for tool:	17%		14%	31%	40%	29%	69%	100%	
CS801.1	3		3	0.93	2	3	1.67	2.60	
CS801.2	3	3	3	0.93	2	3	1.67	2.60	
CS801.3	3	3	3	0.93	2	3	1.67	2.60	
CS801.4	3	3	3	0.93	2	3	1.67	2.60	
CS801.5	3	3	3	0.93	2	3	1.67	2.60	
				0.93			1.67	2.60	

CO	Final CO-PO Attainment for Course												
	PO												
	1	2	3	4	5	6	7	8	9	10	11	12	PSO
CS801.1	1.73	1.73	1.73										1
CS801.2	2.60	2.60	2.60										1.73
CS801.3	2.60	2.60	2.60										1.73
CS801.4	2.60	2.60	1.73										1.73
CS801.5		2.60	2.60						1.73				2.60
PCC- CS801	2.38	2.43	2.02	-	-	-	-	-	-	1.73	-	-	2.08
													2.60





Final CO-PO Attainment for Course



Final CO-PSO Attainment for Course



Target and Attainment of 2021-22

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Target	2.75	2.80	2.33	-	-	-	-	2.00	-	-	-	-	2.40	3.00
Attained	2.38	2.43	2.07	-	-	-	-	1.73	-	-	-	-	2.08	2.60
% Attainment	86.67	86.67	86.67	-	-	-	-	86.67	-	-	-	-	86.67	86.67

Observation:-

1. Students has provided question bank so using this they had performed well in C E exam.
2. Students were made aware about how to apply basic concept of all prerequisite courses for Data Analytics
3. Students were perform good in university exam so overall attainment is improved


Action taken:-

1. Question paper solution has made available to student.
2. Question bank is provided in advance to students so that they can prepare and perform well in tests.
3. Additional assignment has given to students

Attainment Level	
Active	If % of attainment is greater than 80%
Moderately achieved	If % of attainment is in between 70% to 79%
Not achieved	If % of attainment is Lower than 60%

PO	% Attainment	Level	Observation	Action taken
PO1	86.67	Achieved		Fundamentals regarding data analysis is discussed in lectures as prerequisites for this subjects.
PO2	86.67	Achieved	All COs majorly contributed to achieves these POs	PPTs were made available to have more interaction during lectures.
PO3	86.67	Achieved		
PO4	86.67	Achieved	CS501.5 majorly contributed to achieves these PO	Students were assigned case study for real time example.
PO5	86.67	Achieved	All COs majorly contributed to achieves these PO	How to analysis problem was discussed during lectures with PPTs
PO6	86.67	Achieved	CS501.5 majorly contributed to achieves these PO	How to design and implement solution was discussed during lectures with and PPTs.




Director
D. Y. Patil Technical Campus
 Faculty of Engineering & Faculty of Management
 -1st. and 2nd. Flr. Halkarnani Dist. Pune