



BAPATLA ENGINEERING COLLEGE:: BAPATLA (Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Data Sciences

**First Year B.Tech (SEMESTER – I) structure as per APSCHE
for the Academic Year 2020-21**

Code No.	Category Code	Subject	Scheme of Instruction (Hours per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
20DS101/MA01	BS	Linear algebra and differential equations	3	0	0	3	30	70	100	3
20DS102/PH03	BS	Semiconductor Physics	3	0	0	3	30	70	100	3
20DS103/EE01	ES	Basic Electronics & Electrical Engineering	3	0	0	3	30	70	100	3
20DS104/HS01	HS	Communicative English	3	0	0	3	30	70	100	3
20DSL101/PHL02	BS	Semiconductor Physics Lab	0	0	3	3	30	70	100	1.5
20DSL102/EEL01	ES	Basic Electronics & Electrical Engineering Lab	0	0	3	3	30	70	100	1.5
20DSL103/HSL01	HS	English Communication skills Lab	0	0	3	3	30	70	100	1.5
20DS105/CE01	MC	Environmental Studies	2	0	0	2	30	0	30	0
INDUCTION PROGRAM	First Three Weeks (Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Familiarization to Dept./Branch & Innovations)									
TOTAL			14	0	09	23	240	490	730	16.5

CIE: Continuous Internal Evaluation

SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

BS: Basic Science courses HS: Humanities and Social science ES: Engineering Science Courses

MC: Mandatory course

1 Hr. Lecture (L) per week - 1 credit

1 Hr. Tutorial (T) per week - 1 credit

1 Hr. Practical (P) per week - 0.5 credits

2 Hours Practical (Lab)/week - 1 credit



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First Year B.Tech (SEMESTER – II)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
20DS201/MA02	BS	Numerical Methods & Advanced Calculus	3	0	0	3	30	70	100	3
20DS202/CY01	BS	Engineering Chemistry	3	0	0	3	30	70	100	3
20DS203/CS01	ES	Programming for Problem Solving	3	0	0	3	30	70	100	3
20DS204	ES	Digital Logic Design	3	0	0	3	30	70	100	3
20DS205	ES	Discrete Mathematics	3	0	0	3	30	70	100	3
20DSL201/MEL01	ES	Engineering Graphics	1	0	4	5	30	70	100	3
20DSL202/CYL01	BS	Chemistry Lab	0	0	3	3	30	70	100	1.5
20DSL203/CSL01	ES	Programming for Problem Solving Lab	0	0	3	3	30	70	100	1.5
20DSL204/MEL02	ES	Workshop Practice Lab	0	0	3	3	30	70	100	1.5
TOTAL			16	0	14	30	270	630	900	22.5

CIE: Continuous Internal Evaluation

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MC: Mandatory course



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Data Sciences

Second Year B.Tech (SEMESTER – III)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
20DS301/MA03	BS	Probability & Statistics	3	0	0	3	30	70	100	3
20DS302	PC	Data Structures	3	0	0	3	30	70	100	3
20DS303	PC	Object Oriented Programming	3	0	0	3	30	70	100	3
20DS304	PC	Operating System	3	0	0	3	30	70	100	3
20DS305	PC	Computer Organization	3	0	0	3	30	70	100	3
20DSL301/ SO01	SO	Python	2	0	3	5	30	70	100	3.5
20DSL302	PC	Data Structures Lab	0	0	3	3	30	70	100	1.5
20DSL303	PC	Object Oriented Programming Lab	0	0	3	3	30	70	100	1.5
	MC	Professional Ethics & Human Values	2	0	0	2	30	0	30	0
NCC/NSS			0	0	3	3				0
TOTAL			19	0	9	28	270	560	830	21.5

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For

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Second Year B.Tech (SEMESTER – IV)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
	ES	Mathematical Foundations of Data Sciences	3	0	0	3	30	70	100	3
	PC	Web Technologies	3	0	0	3	30	70	100	3
	PC	Database Management System	3	0	0	3	30	70	100	3
	PC	Design and Analysis of Algorithms	3	0	0	3	30	70	100	3
	HS	Technical English	3	0	0	3	30	70	100	3
	PC	Web Technologies Lab	0	0	3	3	30	70	100	1.5
	PC	RDBMS Lab	0	0	3	3	30	70	100	1.5
	SO	R Programming	2	0	3	5	30	70	100	3.5
TOTAL			17	0	9	26	240	560	800	21.5
Honors/Minor Course			3	1	0	4	30	70	100	4
Grand Total			20	1	9	30	270	630	900	25.5

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Third Year B.Tech (SEMESTER – V)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
	PC	Automata Theory & Formal Languages	3	0	0	3	30	70	100	3
	PC	Computer Networks	3	0	0	3	30	70	100	3
	PC	Software Engineering	3	0	0	3	30	70	100	3
	JO	Job Oriented Elective - 1	3	0	0	3	30	70	100	3
	PE	Professional Elective - 1	3	0	0	3	30	70	100	3
	MC	Essence of Indian Traditional Knowledge	2	0	0	2	30	0	30	0
	PC	Software Engineering Lab	0	0	3	3	30	70	100	1.5
	JO	Job Oriented Elective Lab -1	0	0	3	3	30	70	100	1.5
	SO	Soft Skills	1	0	2	3	30	70	100	2
	INT	Summer Internship	0	0	0	0	0	0	0	1.5
TOTAL			18	0	8	26	270	560	830	21.5
Honors/Minor Course			3	1	0	4	30	70	100	4
Grand Total			21	1	8	30	300	630	930	25.5

CIE: Continuous Internal Evaluation

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BS: Basic Science courses HS: Humanities and Social science ES: Engineering Science Courses

MC: Mandatory course



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Data Sciences

Third Year B.Tech (SEMESTER – VI)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
	PC	Compiler Design	3	0	0	3	30	70	100	3
	PC	Machine Learning	3	0	0	3	30	70	100	3
	PC	Cryptography	3	0	0	3	30	70	100	3
	PE	Professional Elective -2	3	0	0	3	30	70	100	3
	JO	Job Oriented Elective - 2	3	0	0	3	30	70	100	3
	MC	Constitution of India	2	0	0	2	30	0	30	0
	PC	Machine Learning Lab	0	0	3	3	30	70	100	1.5
	PC	Cryptography Lab	0	0	3	3	30	70	100	1.5
	JO	Job Oriented Elective Lab - 2	0	0	3	3	30	70	100	1.5
	SO	Advanced Skill Oriented -1	1	0	2	3	30	70	100	2
TOTAL			18	0	11	29	300	630	930	21.5
Honors/Minor Course			3	1	0	4	30	70	100	4
Grand Total			20	1	9	30	270	630	900	25.5

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Fourth Year B.Tech (SEMESTER – VII)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
	PE	Professional Elective - 3	3	0	0	3	30	70	100	3
	PE	Professional Elective - 4	3	0	0	3	30	70	100	3
	JO	Job Oriented Elective - 3	3	0	0	3	30	70	100	3
	JO	Job Oriented Elective - 4	3	0	0	3	30	70	100	3
	HS	Industrial Management & Entrepreneurship Development	3	0	0	3	30	70	100	3
	JO	Job Oriented Elective – 3 Lab	0	0	3	3	30	70	100	1.5
	JO	Job Oriented Elective – 4 Lab	0	0	3	3	30	70	100	1.5
	SO	Advanced Skill Oriented -2	1	0	2	3	30	70	100	2
	INT	Industrial/ Research Internship	0	0	0	0	0	0	0	3
TOTAL			16	0	8	24	240	560	800	23
Honors/Minor Course			3	1	0	4	30	70	100	4
Grand Total			20	1	9	30	270	630	900	27

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Fourth Year B.Tech (SEMESTER – VIII)

for the Academic Year 2020-21

Code No.	Category Code	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
	PROJ	Project Work	0	0	0	0	50	100	150	12
Honors/Minor Courses (MOOCs - 1)			0	0	0	0	0	0	0	2
Honors/Minor Courses (MOOCs - 2)			0	0	0	0	0	0	0	2
Grand Total			0	0	0	0	50	100	150	16

CIE: Continuous Internal Evaluation

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MC: Mandatory course

List of Professional Electives:-

1. Data Warehousing & Data Mining.
2. Artificial Intelligence.
3. Matrix Computation & Optimization.
4. Social Network Analysis.
5. Probabilistic Graphical Models.
6. Pattern Recognition & Computer Vision.
7. Natural Language Processing.
8. Block chain Technologies.
9. Distributed Computing.

List of Job Oriented Electives:-

1. Data Handling.
2. Feature Engineering.
3. Web Analytics
4. Big Data Analytics
5. Biomedical Image Processing
6. Artificial Neural networks & Deep Learning
7. Mobile Application Development
8. Cloud Programming
9. Internet of Thing

List of Advanced Skill Oriented Elective:-

1. Data Visualization
2. Full Stack Development
3. DevOps
4. Robotic Process Automation



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List of Subjects offered under Honors in Data Sciences

Note: - Students have to acquire 20 credits for the award of Honors in Data Sciences.

- i. 16 credits (04 courses@ 4 credits each) shall be earned through the following list of courses.
- ii. 4 credits (02 courses@ 2 credits each) must be acquired through two MOOCs from the following list of courses with a minimum duration of 8/12weeks.
- iii. Before choosing those courses, students must complete prerequisites.

1. Advanced Data Structures.
2. Advanced Computer Architecture
3. Graph Theory
4. Numerical Optimization.
5. Advanced Database Systems
6. Real Time Operating Systems.
7. Parallel Algorithms.
8. Embedded Systems.
9. Stochastic Models.
10. Combinatorial Optimization.
11. Intelligent Systems and Interfaces.
12. Computer Vision.
13. Advanced Statistical Algorithms
14. Social Media Data Mining.
15. Detection and Estimation Theory.
16. Computations Systems Biology.