



Bapatla Engineering College

(Autonomous)

Mahatmaji Puram, BAPATLA-522102, Guntur (Dt.), A.P., INDIA

Sponsored by the Bapatla Education Society

Estd.1981

Approved by AICTE: Affiliated to Acharya Nagarjuna University

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

August 24, 2021.

Minutes of the Board of Studies in Data Science & Cyber Security, online meeting held on August 7, 2021 at 10:30 AM

Members present at the meeting

1. Dr.Shaik Nazeer,
Prof. & Head, Dept. of Computer Science and Engg.,
Bapatla Engineering College (Autonomous),
Chairman
2. Dr. Mohammed Misbahuddin,
Joint Director,
C-DAC, Bangalore
97402 04754
mdmisbahuddin@gmail.com
Member
3. Dr. V N Sastry
Professor & Head,
Institute for Development and Research in Banking Technology (IDRBT),
Hyderabad
vnsastry@idrbt.ac.dot.in
Member
4. Dr. M Sreelatha,
Professor & Head
Department of CSE,
RVR & JC College of Engineering,
Guntur-522 019.
hodcse@rvrjc.ac.in
Member
5. Mr. Suresh Reddy Allam
Global Execution Lead - Secure Systems Group,
Hyderabad,
Telangana, India.
Member
6. Mr. Sandeep Mudalkar
CEO & Founder,
Sytech Labs Pvt Ltd.,
Hyderabad,
sandeep@sytechlabs.com
Member

Page 1 of 3

The following items were on the agenda for discussion:

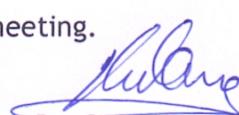
1. Discuss and finalize the B.Tech (CSE-Data Science) II, III & IV Year scheme for R20 regulation.
2. Discuss and finalize the B.Tech (CSE-Cyber Security) II, III & IV Year scheme for R20 regulation.
3. Any other matter with the permission of the chair

The Meeting was organized in online mode due to pandemic. The Chairman, BOS Introduced the members of the BoS and welcomed the members for the meeting and presented the details of the agenda to the members.

The following resolutions were passed in the BOS meeting:

1. In the present meeting of BoS, the schemes of II Year B.Tech (CSE-Data Science) and B.Tech (CSE-Cyber Security) are finalized.
2. However for the sake of completeness the schemes of III & IV Year of B.Tech(CSE-Data Science) and B.Tech (CSE-Cyber Security) are tentatively finalized, which will be taken up for finalization in the subsequent meetings of BoS.
3. The syllabi for the subjects of II Year B.Tech (CSE-Data Science) and B.Tech (CSE-Cyber Security) will be mailed soon for your suggestions.
4. The chairman is authorized to finalize the model paper, paper setters and examiners for each subject in B.Tech (CSE-Data Science) and B.Tech (CSE-Cyber Security) for the A.Y. 2021-22
5. The Chairman is authorized to convene the departmental committee meeting to do any minor changes in the scheme or syllabus with the approval of the committee.

The Chairman, BOS thanked the members before concluding the meeting.



Dr. SHAIK NAZEER 24/08/21
Chairman, Board of Studies &
Head, Dept. of Computer Science and Engg.,
Bapatla Engineering College, Bapatla.

Copy to:

The Principal, Bapatla Engineering College,
PA to The President, Bapatla Education Society,
Members, Board of Studies.



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Faculty members attended for Board of Studies in Data Science and Cyber Security online meeting held on August 7, 2021 at 10.30am.

S.no	Name of the Faculty	Designation	Sno		
1	Dr. N. Sudhakar	Professor	16	Mr. V. Naveen Kunar	Asst. Professor
2	Prof. V. Chakradhar	Professor	17	Mr. R. Pavan Karthik	Asst. Professor
3	Dr. P.S. Vachaspati	Professor	18	Mr. S.N. Chandra Sekhar	Asst. Professor
4	Dr. P. Pardha Saradhi	Professor	19	Mr. R. Veera Mohan Rao	Asst. Professor
5	Dr. S. Rama Krishna	Assoc. Professor	20	Mr. J. Kumara Raja	Asst. Professor
6	Dr. T. S. Murthy	Assoc. Professor	21	Smt. M. Karuna	Asst. Professor
7	Dr. K. Kishore Babu	Assoc. Professor	22	Mr. A. Ravi Kishore	Asst. Professor
8	Dr. R. Daniel	Assoc. Professor	23	Mr. P. Nanda Kishore	Asst. Professor
9	Mr. M. Rajesh Babu	Asst. Professor	24	Mr. J. Madhan Kumar	Asst. Professor
10	Dr. C. R. Raman	Asst. Professor	25	Mr. B. Prasanth Babu	Asst. Professor
11	Smt. CH. Mangamma	Asst. Professor	26	Mr. K. Ashok Babu	Asst. Professor
12	Mr. K. Kishan Chand	Asst. Professor	27	Smt. J. Swarupa	Asst. Professor
13	Mr. T. Nagarjuna	Asst. Professor	28	Mr. A. Gopinadh	Asst. Professor
14	Mr. K. Mani Deep	Asst. Professor	29	Mr. M.V. Pavan Kumar	Asst. Professor
15	Mr. K. Arun Babu	Asst. Professor			



24/8/24

Dr. SHAIK NAZEER
Chairman, Board of Studies &
Head, Dept. of Computer Science and Engg.,
Bapatla Engineering College, Bapatla.



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**Dr. Nazeer Shaik, M.Tech., Ph.D.,
Prof. & Head**

Ref.: -BEC/BOS/CSE/2021/03082021

Date: August 03, 2021.

Meeting of BoS (Data Science & Cyber Security)

It is my pleasure to invite you to the online meeting of Board of Studies in Data Science & Cyber Security which is scheduled on 7/08/2021 at 10.30 am. The agenda is as follows

1. Discuss and finalize the B.Tech (CSE-Data Science) 2nd, 3rd & 4th year scheme for R20 regulation.
2. Discuss and finalize the B.Tech (CSE-Cyber Security) 2nd, 3rd & 4th year scheme for R20 regulation.
3. Any other matter with the permission of the chair

Copy to

1. Dr. Mohammed Misbahuddin, Joint Director, C-DAC, Bangalore.
2. Dr. V N Sastry, Professor, Institute for Development and Research in Banking Technology (IDRBT), Hyderabad.
3. Dr. M Sreelatha, Professor & Head, Dept. of CSE, RVR & JC College of Engineering, Guntur.
4. Mr. Suresh Reddy Allam, Global Execution Lead - Secure Systems Group, Hyderabad.
5. Mr. Sandeep Mudalkar, CEO & Founder, Sytech Labs Pvt Ltd., Hyderabad.
6. All the faculty members of the Department of CSE


Dr. SHAIK NAZEER 3/8/21
Professor & Head,
Dept. of CSE,
Bapatla Engineering College

Attachments:

1. R-20 B.Tech-Data Science draft Scheme document
2. R-20 B.Tech-Cyber Security draft Scheme document



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Cyber Security

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	
20CB101/MA01	BS	Linear algebra and differential equations	3	0	0	3	30	70	100	3
20CB102/PH03	BS	Semiconductor Physics	3	0	0	3	30	70	100	3
20CB103/EE01	ES	Basic Electronics & Electrical Engineering	3	0	0	3	30	70	100	3
20CB104/HS01	HS	Communicative English	3	0	0	3	30	70	100	3
20CBL101/PHL02	BS	Semiconductor Physics Lab	0	0	3	3	30	70	100	1.5
20CBL102/EEL01	ES	Basic Electronics & Electrical Engineering Lab	0	0	3	3	30	70	100	1.5
20CBL103/HSL01	HS	English Communication skills Lab	0	0	3	3	30	70	100	1.5
20CB105/MC01	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



BAPATLA ENGINEERING COLLEGE:: BAPATLA
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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Cyber Security

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	
20CB201/MA02	BS	Numerical Methods & Advanced Calculus	3	0	0	3	30	70	100	3
20CB202/CY01	BS	Engineering Chemistry	3	0	0	3	30	70	100	3
20CB203/CS01	ES	Programming for Problem Solving	3	0	0	3	30	70	100	3
20CB204	ES	Digital Logic Design	3	0	0	3	30	70	100	3
20CB205	ES	Discrete Mathematics	3	0	0	3	30	70	100	3
20CBL201/MEL01	ES	Engineering Graphics	1	0	4	5	30	70	100	3
20CBL202/CYL01	BS	Chemistry Lab	0	0	3	3	30	70	100	1.5
20CBL203/CSL01	ES	Programming for Problem Solving Lab	0	0	3	3	30	70	100	1.5
20CBL204/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

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



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Cyber Security
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		
20CB301/MA03	BS	Probability & Statistics	3	0	0	3	30	70	100	3
20CB302	PC	Data Structures	3	0	0	3	30	70	100	3
20CB303	PC	Object Oriented Programming	3	0	0	3	30	70	100	3
20CB304	PC	Operating System	3	0	0	3	30	70	100	3
20CB305	PC	Computer Organization	3	0	0	3	30	70	100	3
20CBL301/SO01	SO	Python	2	0	3	5	30	70	100	3.5
20CBL302	PC	Data Structures Lab	0	0	3	3	30	70	100	1.5
20CBL303	PC	Object Oriented Programming Lab	0	0	3	3	30	70	100	1.5
20CB306/MC02	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

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



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Cyber Security
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	
20CB401/MA04	ES	Mathematical Foundations of Security	3	0	0	3	30	70	100	3
20CB402	PC	Web Technologies	3	0	0	3	30	70	100	3
20CB403	PC	Database Management System	3	0	0	3	30	70	100	3
20CB404	PC	Design and Analysis of Algorithms	3	0	0	3	30	70	100	3
20CBL405/HS02	HS	Technical English	3	0	0	3	30	70	100	3
20CBL401	SO	Kali Linux Virtual Lab Setup	2	0	3	5	30	70	100	3.5
20CBL402	PC	Web Technologies Lab	0	0	3	3	30	70	100	1.5
20CBL403	PC	RDBMS Lab	0	0	3	3	30	70	100	1.5
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

CIE: Continuous Internal Evaluation

SEE: Semester End Examination

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

MC: Mandatory course



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Cyber Security

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		
	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

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



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Cyber Security

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

CIE: Continuous Internal Evaluation

SEE: Semester End Examination

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

MC: Mandatory course



BAPATLA ENGINEERING COLLEGE:: BAPATLA
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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Cyber Security

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

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



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Cyber Security

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	
	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

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List of Professional Electives:-

1. Introduction to Cyber Laws
2. Malware Analysis & Reverse Engineering
3. Security Assessment & Risk Analysis
4. Information Theory & Audit Monitoring
5. Cyber Crime Investigation and Digital Forensics
6. Protocols for Secure Electronic Commerce
7. Block chain Technologies
8. Wireless Networks
9. Distributed Systems.

List of Job Oriented Electives:-

1. Web & Data Security
2. Ethical Hacking & Social Engineering
3. Intrusion Detection and Prevention System
4. Secure Coding
5. Bio Metric Security
6. Digital Watermarking & Steganography
7. Mobile Application Security
8. Cloud Security
9. IoT security

List of Advanced Skill Oriented Elective:-

1. Network Simulation
2. Full Stack Development
3. DevOps
4. Robotic Process Automation



BAPATLA ENGINEERING COLLEGE:: BAPATLA **(Autonomous)**

List of Subjects offered under Honors in Cyber Security

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

- 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 8/12 weeks.
- 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. Secure Computation
10. Firewall & VPN Security
11. Network Security & Cyber Laws.
12. Cyberspace Operations and Design.
13. Applied Cryptography.
14. Security Governance, Risk and compliance.
15. Perception & Computer Vision.
16. Secure Software Design & Enterprise Computing



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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

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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



BAPATLA ENGINEERING COLLEGE:: BAPATLA
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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Data Sciences

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		
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

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



BAPATLA ENGINEERING COLLEGE:: BAPATLA

(Autonomous)

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

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



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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Data Sciences

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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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Data Sciences

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		
	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

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
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		
	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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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Data Sciences

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		
	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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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Data Sciences

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

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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 8/12 weeks.
- 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.