BAPATLA ENGINEERING COLLEGE:: BAPATLA

(Autonomous)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Scheme
(w.e.f. 2022-2023)

4 Year B.Tech Program

of

CSE (Artificial Intelligence & Machine Learning)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

BAPATLA ENGINEERING COLLEGE :: BAPATLA

(AUTONOMOUS UNDER ACHARYA NAGARJUNA UNIVERSITY)

(SPONSORED BY BAPATLA EDUCATION SOCIETY)

BAPATLA - 522102 GUNTUR DISTRICT, A.P.

www.becbapatla.ac.in

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Structure Summary

S.No	Category	Credits	% of Credits
1	Humanities & Social Science including Management Courses	10.5	6.5
2	Basic Science Courses	19.5	12.2
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	19.5	12.2
4	Professional Core Courses	54	33.8
5	Professional Elective Courses	12	7.5
6	Job Oriented/Open Elective Courses	18	11.2
7	Project work, seminar, and internship in industry or elsewhere	16.5	10.3
8	Skill Oriented Courses	10	6.3
9	Mandatory Courses [Environmental Science, PEHV, Indian Constitution, Essence of Indian Traditional Knowledge etc]	-	-
Total		**160**	**100**

Semester Wise Credits Summary

Semester	Credits	With Honor Credits
Semester-I	19.5	19.5
Semester-II	19.5	19.5
Semester-III	21.5	21.5
Semester-IV	21.5	25.5
Semester-V	21.5	25.5
Semester-VI	21.5	25.5
Semester-VII	23	27
Semester-VIII	12	16
Total	**160**	**180**

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
CSE (Artificial Intelligence and Machine Learning)
First Year B.Tech (SEMESTER – I) structure as per APSCHE

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	
22CM101/MA01	BS	Linear algebra and differential equations	3	0	0	3	30	70	100	3
22CM102/PH03	BS	Semiconductor Physics	3	0	0	3	30	70	100	3
22CM103/EE01	ES	Basic Electronics & Electrical Engineering	3	0	0	3	30	70	100	3
22CM104/EL01	HS	Communicative English	3	0	0	3	30	70	100	3
22CM105/CS02	ES	Introduction to Problem Solving	3	0	0	3	30	70	100	3
22CML101/PHL02	BS	Semiconductor Physics Lab	0	0	3	3	30	70	100	1.5
22CML102/EEL01	ES	Basic Electronics & Electrical Engineering Lab	0	0	3	3	30	70	100	1.5
22CML103/ELL01	HS	English Communication skills Lab	0	0	3	3	30	70	100	1.5
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			**15**	**0**	**09**	**23**	**240**	**560**	**800**	**19.5**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture, T: Tutorial, P: Practical
BS: Basic Sciences ES: Engineering Sciences HS: Humanities and Social Sciences
INT: Internship JO: Job Oriented MC: Mandatory Course
PC: Professional Core PE: Professional Elective SO: Skill Oriented

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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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
CSE (Artificial Intelligence and Machine Learning)
First Year B.Tech (SEMESTER – II)

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	
22CM201/MA02	BS	Numerical Methods & Advanced Calculus	2	1	0	3	30	70	100	3
22CM202/CY01	BS	Engineering Chemistry	3	0	0	3	30	70	100	3
22CM203/CS01	ES	Programming for Problem Solving	2	1	0	3	30	70	100	3
22CM204	ES	Digital Logic Design	3	0	0	3	30	70	100	3
22CM205	ES	Discrete Mathematics	3	0	0	3	30	70	100	3
22CML202/CYL01	BS	Chemistry Lab	0	0	3	3	30	70	100	1.5
22CML203/CSL01	ES	Programming for Problem Solving Lab	0	0	3	3	30	70	100	1.5
22CML204/MEL02	ES	Workshop Practice Lab	0	0	3	3	30	70	100	1.5
22CM206/MC01	MC	Environmental Studies	2	0	0	2	30	0	30	0
NCC/NSS			0	0	3	3				0
TOTAL			**15**	**2**	**12**	**29**	**270**	**630**	**900**	**19.5**

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
CSE (Artificial Intelligence and Machine Learning)
Second Year B.Tech (SEMESTER – III)

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	
20CM301/MA03	BS	Probability & Statistics	2	1	0	3	30	70	100	3
20CM302	PC	Data Structures	2	1	0	3	30	70	100	3
20CM303	PC	Object Oriented Programming	2	1	0	3	30	70	100	3
20CM304	PC	Operating System	3	0	0	3	30	70	100	3
20CM305	PC	Computer Organization	3	0	0	3	30	70	100	3
20CML301/SO01	SO	Basics of Python	1	0	2	3	30	70	100	2
20CML302	BS	Computational Statistics Lab	0	0	3	3	30	70	100	1.5
20CML303	PC	Data Structures Lab	0	0	3	3	30	70	100	1.5
20CM L304	PC	Object Oriented Programming Lab	0	0	3	3	30	70	100	1.5
20CM306/MC02	MC	Professional Ethics & Human Values	2	0	0	2	30	0	30	0
TOTAL			**16**	**3**	**9**	**28**	**270**	**560**	**830**	**21.5**

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MC: Mandatory course

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
CSE (Artificial Intelligence and Machine Learning)
Second Year B.Tech (SEMESTER – IV)

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	
20CM401	PC	Artificial Intelligence	3	0	0	3	30	70	100	3
20CM402	PC	Web Technologies	3	0	0	3	30	70	100	3
20CM403	PC	Database Management System	3	0	0	3	30	70	100	3
20CM404	PC	Design and Analysis of Algorithms	2	1	0	3	30	70	100	3
20CM405/EL02	HS	Technical English	3	0	0	3	30	70	100	3
20CML401/SO02	SO	Advances of Python	1	0	2	3	30	70	100	2
20CML402	PC	Web Technologies Lab	0	0	3	3	30	70	100	1.5
20CML403	PC	RDBMS Lab	0	0	3	3	30	70	100	1.5
20CML404	PC	Design and Analysis of Algorithms Lab	0	0	3	3	30	70	100	1.5
TOTAL			**16**	**1**	**9**	**26**	**240**	**560**	**800**	**21.5**
20CMH4_	**Honors Course (Pool 1)**		**3**	**1**	**0**	**4**	**30**	**70**	**100**	**4**
Grand Total			**19**	**2**	**9**	**30**	**270**	**630**	**900**	**25.5**

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
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Third Year B.Tech (SEMESTER – V)

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	
20CM501	PC	Machine Learning	2	1	0	3	30	70	100	3
20CM502	PC	Computer Networks	3	0	0	3	30	70	100	3
20CM503	PC	Software Engineering	3	0	0	3	30	70	100	3
20CM504/PE_ _	PE	Professional Elective - 1	3	0	0	3	30	70	100	3
20CM505/JO_ _	JO	Job Oriented Elective - 1	3	0	0	3	30	70	100	3
20CML501/SO03	SO	Soft Skills	1	0	2	3	30	70	100	2
20CML502	PC	Machine Learning Lab	0	0	3	3	30	70	100	1.5
20CML503	JO	Job Oriented Elective-1 Lab	0	0	3	3	30	70	100	1.5
20CML504 /INT01	INT	Summer Internship	0	0	0	0	0	0	0	1.5
20CM506/MC03	MC	Essence of Indian Traditional Knowledge	2	0	0	2	30	0	30	0
TOTAL			**17**	**1**	**8**	**26**	**270**	**560**	**830**	**21.5**
20CMH5_	**Honors Course (Pool 2)**		**3**	**1**	**0**	**4**	**30**	**70**	**100**	**4**
Grand Total			**20**	**2**	**8**	**30**	**300**	**630**	**930**	**25.5**

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JO: Job Oriented Elective MC: Mandatory course INT: Internship

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
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Third Year B.Tech (SEMESTER – VI)

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	
20CM601	PC	Automata Theory & Compiler Design	3	0	0	3	30	70	100	3
20CM602	PC	Deep Learning	2	1	0	3	30	70	100	3
20CM603	PC	Natural Language Processing	3	0	0	3	30	70	100	3
20CM604/PE_ _	PE	Professional Elective -2	3	0	0	3	30	70	100	3
20CM605/JO_ _	JO	Job Oriented Elective - 2	3	0	0	3	30	70	100	3
20CML601/SO04	SO	DevOps	1	0	2	3	30	70	100	2
20CML602	PC	Deep Learning Lab	0	0	3	3	30	70	100	1.5
20CML603	PC	Natural Language Processing Lab	0	0	3	3	30	70	100	1.5
20CML604	JO	Job Oriented Elective -2 Lab	0	0	3	3	30	70	100	1.5
20CM606/MC04	MC	Constitution of India	2	0	0	2	30	0	30	0
TOTAL			**18**	**1**	**9**	**28**	**270**	**560**	**830**	**21.5**
20CMH6_	**Honors Course (Pool 3)**		**3**	**1**	**0**	**4**	**30**	**70**	**100**	**4**
Grand Total			**21**	**2**	**9**	**32**	**300**	**630**	**930**	**25.5**

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JO: Job Oriented Elective MC: Mandatory course

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
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Fourth Year B.Tech (SEMESTER – VII)

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	
20CM701/PE_ _	PE	Professional Elective – 3 / MOOCs *	3	0	0	3	30	70	100	3
20CM702/PE_ _	JO	Job Oriented Elective - 3	3	0	0	3	30	70	100	3
20CM703/JO_ _	JO	Job Oriented Elective - 4	3	0	0	3	30	70	100	3
20CM704/OE_ _	OE	Open Elective / MOOCs *	3	0	0	3	30	70	100	3
20CM705/ME05	HS	Industrial Management & Entrepreneurship Development	3	0	0	3	30	70	100	3
20CML701/SO05	SO	Virtual Reality and Augmented Reality	1	0	2	3	30	70	100	2
20CML702	PC	Job Oriented Elective – 3 Lab	0	0	3	3	30	70	100	1.5
20CML703	JO	Job Oriented Elective – 4 Lab	0	0	3	3	30	70	100	1.5
20CML703/ INT02	INT	Industrial/ Research Internship	0	0	0	0	0	0	0	3
TOTAL			**14**	**0**	**6**	**20**	**180**	**420**	**600**	**23**
20CSM7_/ 20CSH7_	**Honors Course (Pool 4)**		**3**	**1**	**0**	**4**	**30**	**70**	**100**	**4**
Grand Total			**17**	**1**	**6**	**24**	**210**	**490**	**700**	**27**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture, T: Tutorial, P: Practical
HS: Humanities and Social science SO: Skill Oriented Course PE: Professional Elective
JO: Job Oriented Elective OE: Open Elective INT: Internship

* For Professional Elective-3 and/or Open Elective, a student can exercise the option of registering either to the department offered elective (classroom teaching) or any department approved MOOCs course by submitting MOOCs course registration application to the department.

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SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
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Fourth Year B.Tech (SEMESTER – VIII)

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	
20CM801/PW01	PW	Project Work	0	0	0	0	50	100	150	12
20CMH8_	**Honors Courses (MOOCs - 1)**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
20CMH8_	**Honors 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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PW: Project Work

List of Professional Electives:-	**List of Job Oriented Electives**:-
1. Web Mining	1. Full Stack Development
2. Data Warehousing and Business Intelligence	2. Enterprise Programming.
3. Federated Learning	3. Middleware Technologies.
4. Block Chain Technologies.	4. Mobile Application Development.
5. Cryptography & Network Security.	5. Cloud Programming.
6. Robotic Process Automation.	6. Cyber Security.
7. Social Network Analysis.	7. Industrial Internet of Things.
8. Pattern Recognition & Computer Vision.	8. Big Data Analytics

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List of Subjects offered under Honors in CSE(AIML)

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

16 credits (04 courses@ 4 credits each) should be earned through the following list of courses.

4 credits (02 courses@ 2 credits each) must be acquired through two MOOCs from the following list of courses with a minimum duration of 12weeks.

Before choosing those courses, students must complete prerequisites

HONORS POOL

A. Advanced Data Structures.
B. Advanced Computer Architecture.
C. Numerical Optimization.
D. Advanced Database Systems
E. Parallel Algorithms.
F. Embedded Systems
G. Design Patterns.
H. Storage Area Networks
I. Computational Complexity.
J. Competitive Programming.
K. Spatial Informatics.
L. Perception & Computer Vision.

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List of Courses offered under the MOOCs (Jan)

Guidelines: - A student willing to take MOOCS course should apply in the prescribed format to the concerned Head of the Department at least one week prior to the commencement of the MOOC course.

The MOOC committee should ensure the following

The course duration must be minimum of 12 weeks

The course should contain a proctored examination for evaluation

The agency offering MOOCs should be a recognized and reputed one and approved by the BOS of the concerned program.

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Students should submit the Course completion certificate with marks memos to the department MOOCs committee.

If the certifying authority/agency is not able to conduct the exam, then the student can show certified course progress, applied hall ticket and mail communication from the authority as proofs and can avail the extension time by one semester for submitting the course completion certificate.

After the student submits the MOOCs certificates, the committee should recommend 3 credits and the appropriate grade to be allocated to the student and send to the Controller of Examination.

If a student fails to successfully complete and acquire the certificate as per the guidelines and timelines specified by the concerned MOOCs authority, he/she has to register for that course subsequently. Unsuccessful candidates in the first attempt shall be marked as supplementary.

1. Advanced Computer Architecture
2. Advanced Computer Networks
3. Cloud Computing
4. Data Analytics with Python
5. Ethical Hacking
6. Getting Started with Competitive Programming
7. Introduction To Internet of Things
8. Social Networks