MINUTES OF THE **FIRST MEETING OF THE ACADEMIC COUNCIL OF GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS)** HELD ON 27th July 2024 AT 11.00 AM IN THE COLLEGE CAMPUS, MADHURAWADA, VISAKHAPATNAM

Members present:

1.	Prof. Dr. Raj Kumar Goswami, Principal, GVPCEW (A)	Chairman
2.	Dr. G. Sudheer, Professor & Vice-Principal, GVPCEW (A)	
3.	Dr. P. V. S. L. Jagadamba, Chairperson, BoS & Head, Dept of CSE, GVPCEW (A)	
4.	Dr. D. K. Bebarta, Chairman, BoS, & Head, Dept of CSE (AIML), GVPCEW (A)	
5.	Dr. M Bhanu Sridhar, Chairman, BoS, & Head, Dept of IT, GVPCEW (A)	
6.	Dr. P. Murali Krishna Prasad, Chairman, BoS, & Head, Dept of ECE, GVPCEW (A)	
7.	Dr. R. V. S.Lakshmi Kumari, Chairperson, BoS, & Head, Dept of EEE, GVPCEW (A)	
8.	Dr. K. L. Sai Prasad, Chairman, BoS, & Head, Dept of BSH, GVPCEW (A)	
9.	Dr. P Devendra, Associate Prof., Dept of EEE, GVPCEW (A)	(Teacher of the College)
10.	Dr. K. Purushotam Naidu, Asst Prof., Dept of CSE (AIML), GVPCEW (A)	(Teacher of the College)
11.	Dr. D.V.A.N Ravi Kumar, Associate Prof., Dept of ECE, GVPCEW (A)	(Teacher of the College)
12.	Dr. N Sharmili, Associate Professor., Dept of CSE, GVPCEW (A)	(Teacher of the College)
13.	Dr. V. Sujatha, MD, DM (Cardiology)	(Expert – Medicine)

14.	Ms. Pooja Vidya Shankar, Head-Strategic Planning NASCOMM Centre of Excellence IoT & AI	(Expert – Engineering)
15.	Sri P Prabhakar, Superintending Engineer, APTRANSCO	(Expert-Industry)
16.	Prof. Dr. P. Mallikarjuna Rao, Dept of Electrical & Electronics Engineering AU College of Engineering, Visakhapatnam	(University Nominee)
17.	Prof. Dr. S. Vizianandа Row Dept of Computer Science & Systems Engineering AU College of Engineering, Visakhapatnam	(University Nominee)
18.	Prof. Dr. G. Sasibhusana Rao Dept of Electronics & Communication Engineering AU College of Engineering, Visakhapatnam	(University Nominee)
19.	Dr. C. Srinivas, Associate Professor, Dept of IT, GVPCEW (A)	Controller of Examinations
20.	Ms. Ch. Sirisha, Asst Prof, Dept of ECE, GVPCEW (A)	Member Secretary

Leave of absence : The following members/special invitees of Academic Council have obtained prior permission from the Chair to excuse their absence from the meeting

1. Ms. Lakshmi Mukkavalli, Managing Director, Patra India	(Expert – Industry)
2. Sri Pavan Kumar Allu, Technology Head at AI.Cloud for Lifesciences, TCS	(Expert-Industry)

Item- 1 : Welcome Address by Chairman of Academic Council, GVPCEW (A)

Dr. R.K.Goswami, Principal & Academic Council, Chairman, GVPCEW(A) extended a cordial welcome to all the members of the Academic Council of Gayatri Vidya Parishad College of Engineering for Women (Autonomous), and introduced the members present to the Academic Council. He also informed the names of those who have taken prior permission for their inability to attend the meeting.

He made a brief presentation about the credentials of the college and gave a broad idea about the academic plan of the college as it foresees from the academic year 2024-25 post autonomy.

Item-2- Ratification of experts onto Board of Studies of each department

The Member Secretary brought to the notice of the members; the list of experts nominated by the Chairman onto various Board of Studies. The Finalized lists were presented and sought ratification.

Resolution No.GVPCEW (A)-AC-I/07/24/1

The lists of members in the Board of Studies of various departments w.e.f 2024 as presented in Annexure I are ratified.

Item-3- Proposed Academic Regulations for approval

The Member Secretary laid out the proposed Academic Rules and Regulations of the Institution for approval. The members of the council discussed each of the points presented in the Academic Rules and Regulations (R24) and suggested

1. The Rules and Regulations regarding Minors and Honors programs, paper valuation and grading be adopted as per the Affiliating University (Andhra University) procedure.

All the suggestions were incorporated and the rules and regulations redrafted and presented.

Members have gone through the rules and regulations and resolved the following:

Resolution No.GVPCEW (A)-AC-I/07/24/2

1. The Academic Rules and Regulations (R24) with effective from 2024 for B.Tech Programmes including Minors and Honors as presented in Annexure II are approved.
2. The Academic Rules and Regulations (R24) with effective from 2024 for M.Tech Programmes as presented in Annexure III are approved

Item-4. Any other matter

Members have suggested the following:

- Conduct of FDPs in the thrust areas such as DevOps, AI/ML and Quantum Computing
- Explore the possibility of linking with the industry for value added courses.

The members appreciated the way of conduct of proceedings.

The meeting concluded with a Vote of Thanks by the Vice-Principal

Chairman of the Meeting
Academic Council
G.V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

ANNEXURE - I

G.V.P. COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT COMPUTER SCIENCE & ENGINEERING

(2024-2025 to 2027-2028)

1.	Head of the Department (Chairperson)	Dr.P.V.S.L.Jagadamba
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr. Siba Kumar Udgata Professor School of Computer and Information Sciences University of Hyderabad Hyderabad, 500046 email: udgata@uohyd.ac.in Mob: 9705395136
		Dr.Jyothi Vedurada Assistant Professor IIT-Hyderabad
		Dr.R Padmavathy Professor, Dept of CSE NIT – Warangal
4	Vice-Chancellor's Nomination	Dr. B Prajna, Professor, Dept. of Computer Science & Systems Engineering AU College of Engineering (A) Andhra University Mobile:9848750033 Email: prajna.mail@gmail.com
5	Industry Representative	Dr.P.Gayatri Senior Technical Director / Scientist-F National Informatics Centre (NIC) Govt. of India
6	College Alumni	Ms. Sandeep Kaur Senior Software Developer Infinite Computer Solutions Visakhapatnam
7	Expert from outside the Autonomous College for Special Course	Mr.Narra Suresh Delivery Centre Head Infosys Visakhapatnam

Head of the Department
Computer Science & Engineering

Chairman
Academic Council

Principal
G.V.P. College of Engineering for Women
Madhurawada
Visakhapatnam-530048

G.V.P. COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT COMPUTER SCIENCE & ENGINEERING (Artificial Intelligence & Machine Learning) (2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.D.K.Bebarta
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr.Debi Prosad Dogra Associate Professor IIT-Bhubaneswar
		Dr.Anjali Mahapatra Associate Professor IIIT - Bhubaneswar
4	Vice-Chancellor's Nomination	Dr. S. Vizianandа Row, Professor Dept of Computer Science & Systems Engineering AU College of Engineering, Visakhapatnam
5	Industry Representative	Dr.M Subrahmanya Sarma Vice President Accenture Bangalore
6	College Alumni	Ms. Vivekitha Sagi Lead Quality Engineer Persistent Systems Hyderabad
7	Expert from outside the Autonomous College for Special Course	Mr.Rajesh Srinivasan Vice-President – Consulting Delivery CGI India : IT and Business Consulting Services Hyderabad

Head of the Department
Computer Science & Engineering (AIML)

Chairman
Academic Council

Principal
G.V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

G.V.P. COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT INFORMATION TECHNOLOGY

(2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.M Bhanu Sridhar
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr. Rashmi Ranjhan Rout Professor, Dept of CSE NIT-Warangal
		Dr.N. Rukma Rekha Associate Professor, Dept of CSE University of Hyderabad Hyderabad
4	Vice-Chancellor's Nomination	Dr. Kunjam Nageswara Rao Professor Dept of Information Technology AU College of Engineering, Visakhapatnam
5	Industry Representative	Mr. Sasidhar Maruvada Managing Director nu Vizz Software Solutions Bangalore
6	College Alumni	Ms. G Dhana Lakshmi Assistant Professor Dept of CSE, JNTUKCE JNTUK-Kakinada
7	Expert from outside the Autonomous College for Special Course	Mr.Ayyalasomayajula Siva Sankar Principal Consultant / Key Product Manager Sposea B.V. Bangalore

Head of the Department
Information Technology

Chairman
Academic Council

Principal
G V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT ELECTRICAL & ELECTRONICS ENGINEERING (2024-2025 to 2027-2028)

1.	Head of the Department (Chairperson)	Dr.R.V.S.L.Kumari
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr.K Srikumar Professor, Dept of EEE JNTU-GV Vizianagaram
		Dr.A Hemachender Assistant Professor, Dept of EEE NIT-Puducherry Puducherry
4	Vice-Chancellor's Nomination	Dr. P Mallikarjuna Rao Professor Dept of Electrical & Electronics Engineering AU College of Engineering, Visakhapatnam
5	Industry Representative	Dr. M Santhosh Kumar System Design Engineer Sensata Technologies Pune
6	College Alumni	Ms. CH Vijayalakshmi Junior Electrical Engineer ACUTRONIC India Pvt Ltd Hyderabad.
7	Expert from outside the Autonomous College for Special Course	Ms. I Kavya Associate Senior Electrical Engineer Burnsand Mc Donnells India Pvt Ltd Bangalore

Head of the Department
Electrical & Electronics Engineering

Chairman
Academic Council

Principal
G V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

G.V.P. COLLEGE OF ENGINEERING FOR WOMEN

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT ELECTRONICS & COMMUNICATION ENGINEERING (2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.P.M.K.Prasad
2	All Faculty Members of the Department	
3		Dr. Tapan Kumar Gandhi (Ph.D.) FNAE, SMIEEE Professor, Department of Electrical Engineering Indian Institute of Technology Delhi Cadence Chair Professor in Artificial Intelligence & Automation Convener, Computer Technology Chairperson, Project Prakash Charitable Trust Adjunct Faculty, School of AIDE, IIT Jodhpur Email: tgandhi@ee.iitd.ac.in, Ph. : 011-26591153
		Dr. Venkata Mani V Professor, Department of ECE NIT – Warangal
4	Vice-Chancellor's Nomination	Dr. P Rajesh Kumar Professor Dept. of Electronics & Communication Engineering AU College of Engineering (A) Visakhapatnam
5	Industry Representative	Sri A Venkata Krishna CEO Ascentsemi R & D Pvt Limited Bangalore
6	College Alumni	Ms. Krishna Deepika Chittela Staff Engineer - Synopsys Bangalore
7	Expert from outside the Autonomous College for Special Course	Sri Amal Raj Pukkella Founder Digifac Services Pvt Ltd., & COO, Headfitted Pvt Ltd Visakhapatnam

Head of the Department
Electronics & Communication Engineering

Chairman
Academic Council

Principal
G V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

G.V.P. COLLEGE OF ENGINEERING FOR WOMEN

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT BASIC SCIENCES & HUMANITIES - ENGLISH

(2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.K L Sai Prasad
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr.G Survana Lakshmi Professor, Dept of ELT School of English Language Education, EFL University, Hyderabad
		Dr.Chandreie Mukherjee Assistant Professor Department of English IIM Visakhapatnam
4	Vice-Chancellor's Nomination	Dr. N Solomon Benny Assistant Professor & Head of the Department Dept of English, College of Arts & Commerce AU College of Engineering, Visakhapatnam
5	Industry Representative	Ms. Shameem Bhanu Executive Business Administrator, The Quantum AI, Hi-Tech City, Hyderabad
6	College Alumni	Ms. Sai Sindhura Kuppili Guidewire Developer PWC, Hyderabad
7	Expert from outside the Autonomous College for Special Course	Mr. Prasad Boya Director – Operations Quantum AI, Hi-tech City Hyderabad

Head of the Department
Basic Sciences & Humanities

Chairman
Academic Council

Principal
G V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

G.V.P. COLLEGE OF ENGINEERING FOR WOMEN

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT BASIC SCIENCES & HUMANITIES - CHEMISTRY

(2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.K L Sai Prasad
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr.Someswara Rao S Associate Professor Department of Chemistry IIT-Tirupathi
		Dr.Suresh Babu Kalidindi Associate Professor Dept of Chemistry Central Tribal University of AP Vizianagaram
4	Vice-Chancellor's Nomination	Dr. K Basavaiah Professor, Dept of Chemistry College of Science & Technology Andhra University Visakhapatnam
5	Industry Representative	Ms. M Santhoshi Rupa Associate Manager Department of Manufacturing Compliance Pfizer Health Care India Pvt Ltd Lemarthy Village, Parawada Mandal Visakhapatnam
6	College Alumni	Ms. Syed Suhana Amazon Web Services Bangalore
7	Expert from outside the Autonomous College for Special Course	Mr.Akasapu Raviteja Senior Chemist Titanish Laboratories, Chodavaram Vizianagram

Head of the Department
Basic Sciences & Humanities

Chairman
Academic Council

Principal
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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT BASIC SCIENCES & HUMANITIES - MATHEMATICS (2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.K L Sai Prasad
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr. P A Lakshmi Narayana Professor, Dept of Mathematics IIT – Hyderabad
		Dr.Kasi Viswanadham K N S Professor, Dept of Mathematics NIT - Warangal
4	Vice-Chancellor's Nomination	Dr. Ch.Santhi Sundar Raj Professor Dept of Engineering Mathematics AU College of Engineering (A) , Visakhapatnam
5	Industry Representative	Dr. A R J Srikanth Director Databrew Technologies Pvt Ltd
6	College Alumni	Ms. Anitha Chiluvuri Senior Member of Technical Staff (SMTS) Oracle
7	Expert from outside the Autonomous College for Special Course	Mr. Anil Kumar Paluri Assistant Vice President Bank of America

Head of the Department
Basic Sciences & Humanities

Chairman
Academic Council

Principal
G V.P College of Engineering for Women
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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT BASIC SCIENCES & HUMANITIES - PHYSICS (2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.K L Sai Prasad
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr.G. Padmaja Rani Professor & HOD Dept of Physics University College of Engineering JNTUK-Kakinada
		Dr.Arun Kumar R Assistant Professor & HOD School of Sciences NIT-AP
4	Vice-Chancellor's Nomination	Dr. S Srinivasa Rao Professor, Dept of Physics College of Science & Technology Andhra University Visakhapatnam
5	Industry Representative	Dr. Y Purushotham Scientist Centre for Materials for Electronics Technology (C-MET) IDA Phase-III, Cherlapally HCL (PO) Hyderabad
6	College Alumni	Ms. K Hrudaya Team Lead CAPGEMINI
7	Expert from outside the Autonomous College for Special Course	Dr.K.V.Ramesh Sr. Professor Department of Physics GITAM Institute of Sciences GITAM University Visakhapatnam

Head of the Department
Basic Sciences & Humanities

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COMPOSITION AND MEMBERS OF BOARD OF STUDIES IN THE DEPARTMENT BASIC SCIENCES & HUMANITIES – MANAGEMENT STUDIES (2024-2025 to 2027-2028)

1.	Head of the Department (Chairman)	Dr.K L Sai Prasad
2	All Faculty Members of the Department	
3	Subject Experts from outside the College	Dr.A.Narasimha Rao Department of Commerce and Management Studies Andhra University, South Campus, Waltair Junction, Visakhapatnam, Andhra Pradesh, India – 530003 Ph. No. 98483 77644 Email: addada@rediff.com
		Dr.P.Venkata Rao Professor GVP College of Engineering (A) Visakhapatnam 8885043433 pvenkataro@gvpce.ac.in
4	Vice-Chancellor's Nomination	Dr. P Venkateswarlu Professor Dept of Commerce & Management Studies College of Arts & Commerce Andhra University Visakhapatnam
5	Industry Representative	Sri P Rama Krishna IIM Udaipur Founder, Think plus.
6	College Alumni	Tsapala Srujana TCS Human Resource Business Partner
7	Expert from outside the Autonomous College for Special Course	Dr.K.V.V.Murali Someswararao Professor GVP college for Degree and PG courses

Head of the Department
Basic Sciences & Humanities

Chairman
Academic Council

Principal
G V.P College of Engineering for Women
Madhurawada
Visakhapatnam-530048

ANNEXURE - II

ACADEMIC RULES AND REGULATIONS (R-24)

FOR B.TECH. PROGRAMMES INCLUDING HONORS AND MINORS

[Under Choice Based Credit System in line with NEP 2020]

[Effective from 2024-25 admitted batch]

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

MADHURAWADA, VISAKHAPATNAM 530048

AFFILIATED TO ANDHRA UNIVERSITY, VISAKHAPATNAM

ACADEMIC REGULATIONS

FOR B.TECH. PROGRAMMES INCLUDING HONORS AND MINORS

(Under Choice Based Credit System effective from 2024-25 admitted batch)

These Regulations shall be called the **"GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS) - REGULATIONS 2024 (R-24) FOR THE AWARD OF B.TECH. DEGREE".** These regulations shall be applicable for students enrolling for B.Tech. degree programmes at the Institute from Academic Year 2024-25.
The admission of students shall be as per Govt. of Andhra Pradesh rules.
The medium of instruction for course work and examinations at the Institute shall be English.

1. **Award of the Degree/ Degree with Minor specialization/ Degree with Honors Specialization:**

(a) Award of the B.Tech. Degree / B.Tech. Degree with a Minor if she fulfils the following:

(i) Pursues a course of study for not less than four academic years and not more than eight academic years. However, for the students availing Gap year facility this period shall be extended by two years at the most and these two years would in addition to the maximum period permitted for graduation (Eight years).

(ii) Registers for 160 credits and secures all 160 credits.

(b) Award of B.Tech. degree with Honors if she fulfils the following:

(i) Student secures an additional 15 credits fulfilling all the requisites of a B.Tech. program i.e., 160 credits.

(ii) Honors is to be completed simultaneously with B.Tech. programme.

2. **Structure of the B.Tech. program:**

S. No.	Category	Code	Credits breakup
1	Humanities and Social science including Management courses	HSMC	10.5
2	Basic Science courses	BSC	16 -18*
3	Engineering Science courses	ESC	22 – 27*
4	Professional Core Courses	PCC	51 – 54*
5	Open Elective Courses	OEC	12
6	Professional Elective courses	PEC	15
7	Project work, Internship, Seminar	PROJ	18
8	Mandatory courses (Non-credit)	MC	-
9	Skill oriented Courses	SoC	10
		Total Credits	**160**

*The actual value is based on the Department's breakup for the courses.

The credits are allotted as:
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.

2.1 Semester-wise structure:

<table>
<tr><th>Semester</th><th colspan="2">Composition</th><th>Credits</th></tr>
<tr><td>0</td><td colspan="2">Induction Programme (2-3 weeks)</td><td>0 Credits</td></tr>
<tr><td>I</td><td>5 Theory + 3 Labs
[19.5 Credits]</td><td rowspan="2"></td><td rowspan="2">39 Credits</td></tr>
<tr><td>II</td><td>5 Theory + 3 Labs
[19.5 Credits]</td></tr>
<tr><td>III</td><td>5 Theory + 2/ 3 Labs + 1 skill lab
[20-21.5 Credits]</td><td rowspan="2">Includes
Non-Credit Mandatory Courses
PEUHV& NCC/NSS/Social Activities/ Life skills/ ES</td><td rowspan="2">41.5 Credits</td></tr>
<tr><td>IV</td><td>5 Theory + 2/3 Labs + 1 skill lab
[20-21.5 Credits]</td></tr>
<tr><td colspan="4">Intern-I: 2 Months Community oriented Internship (CSP-Mandatory) during summer vacation</td></tr>
<tr><td>V</td><td>3 Theory + 2/3 Labs + 1 PE+ 1 OE + 1 skill course + Internship-I
[22-23.5 Credits]</td><td rowspan="2">Includes
Non-Credit Mandatory Courses</td><td rowspan="2">43.5 Credits</td></tr>
<tr><td>VI</td><td>3 Theory + 2/3 Labs + 1 PE + 1 OE + 1 skill course
[20-21.5 Credits]</td></tr>
<tr><td colspan="4">Intern-II: 2 Months Industrial/Research Internship (Mandatory) during summer vacation</td></tr>
<tr><td>VII</td><td>3 PE + 2 OE +1 HSSE+1 skill course + Industrial Internship-II
[22 credits]</td><td></td><td>22 Credits</td></tr>
<tr><td>VIII</td><td>Project work / Internship in Industry
[14 credits]</td><td></td><td>14 Credits</td></tr>
<tr><td colspan="3">TOTAL CREDITS FOR REGULAR PROGRAMME</td><td>160 Credits</td></tr>
</table>

Non-credit mandatory courses: Environmental Sciences, Human Values & Professional Ethics, Indian Constitution, Essence of Indian Traditional Knowledge

Students opting for Minors shall complete 4 courses from the prescribed list during IV to VII Semesters by registering for a minimum of one course in each semester and earn 12 credits.

Students opting for Honors shall complete 5 courses from the prescribed list during IV to VII Semesters by registering for a minimum of one course in each semester and earn 15 credits.

3. **Student Induction Programme:** There will be mandatory student induction programme for freshers for two to three weeks before the commencement of first semester. Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations etc.

4. A student shall register for courses in each semester offered by the concerned department under Choice Based Credit System (CBCS). The Open Electives are offered to students of all branches in general. However, a student shall choose an open elective from the list in such a manner that she has not studied the same course during the Programme.

5. All the students shall register for NCC/NSS/Social activities/life skills. A student will be required to participate in an activity for two hours in a week during Third/ Fourth/ Fifth semesters. Grade shall be awarded as Satisfactory or Unsatisfactory in the mark sheet on the basis of participation, attendance, performance and behavior. If a student gets an unsatisfactory Grade, she shall repeat the above activity in the subsequent years, in order to complete the degree requirements.

6. A student shall be permitted to pursue up to a maximum of 20% of total credits (i.e., 32 Credits out of a total 160 credits) from elective courses (from Professional, HSS and Open Electives only) under MOOCs during B.Tech. programme. Every student shall mandatorily complete a minimum one course under MOOCs. Each of the courses must be of a minimum 8 weeks/ 12 weeks in duration. One faculty in-charge is nominated for each course to monitor the registration and progression of the student. Attendance will not be counted for courses under MOOCs. The Head of the department shall notify the list of such courses at the beginning of the semester. The student has to pursue and acquire a certificate for a course under MOOCs (NPTEL/SWAYAM) from the organizations/agencies approved by the BoS in order to earn the 2 credits/ 3 credits within the same semester.

7. The students shall register for professional and open elective courses at the beginning of the semester. There shall be a limit on the minimum and maximum number of registrations based on class / section strength.

8. Students shall undergo mandatory summer internships for a minimum of six weeks duration each at the end of second and third year of the Programme. There shall also be mandatory full internship in the final semester of the Programme. (implementation shall be in line with the guidelines of APSCHE / affiliating University).

9. **Attendance Requirements:**

   i) A student shall be eligible to appear for end semester examinations if she acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.
   - In the case of students who participate in activities like NSS, NCC, sports, intercollegiate tournaments conducted at National level/State Level/ University Level with prior approval of the Principal, the candidate may be deemed to have attended the college during the actual period of such activity, solely for the purpose of attendance.
   - Participating in the seminar, workshop, conference with prior approval of the Principal, the candidate may be deemed to have attended the college during the actual period of

such activity, solely for the purpose of attendance permission. The maximum period of such events is limited to 10 days.

- In the case of students admitted under special circumstances (late admission / transfer etc.,), the candidate shall attend at least 50% of the total classes held during semester and shall have attended at least 75% of the total classes held from the date of admission of the student.

ii) Condonation for shortage of attendance in aggregate up to 10% (greater than 65% and less than 75%) in each semester may be granted on medical grounds. A stipulated fee shall be payable to the college towards condonation of shortage of attendance.

iii) Students whose shortage of attendance is not condoned in any semester are detained and are not eligible to take their end semester examination of that class and their registration shall stand cancelled.

iv) A student will not be promoted to the next semester unless she satisfies the attendance requirements of the present semester, as applicable. They shall seek readmission and continue her course of study from that semester when offered next.

10. Method of Evaluation:

The performance of a student in each semester shall be evaluated through Continuous Internal Evaluation and End Semester Examination. The student shall earn the credits in the respective courses by obtaining at least the marks as specified in the pass criteria given below:

S. No	Type of Course	Continuous Internal Evaluation	End Semester Examination (3 hours)		Pass Criteria
			Max Marks	Evaluation	
1.	Theory Courses	30 Marks Evaluation process: 20 marks (Two internal tests each for 20 marks.) 10 marks (Four assessments 2 before mid1 and 2 before mid-2 by at least any two of the following methods each for 05 marks. (Assessment Methods: Assignment / Quiz / Term paper / Surprise test / seminar / Open book test / Case study / Projects /Any other Teacher specific method). The final internal score is [4*(best of the two out of 30) +1*(the other mark)]/5	70 Marks	Double Valuation	**40% (28 marks) from End semester and 40% (40 marks) on aggregate from Internal and End semester Examination put together.**

S. No	Type of Course	Continuous Internal Evaluation	End Semester Examination (3 hours)		Pass Criteria
			Max Marks	Evaluation	
2.	Professional Elective/ Open Elective	30 Marks (same as that for Theory course in S. No. 1)	70 Marks	Double Valuation	**40% (28 marks) from End semester and 40% (40 marks) on aggregate from Internal and End semester Examination put together.**
3.	Practical Courses Including CAD/e-CAD and Engg. Workshop	50 Marks 20 marks (15 marks for day-wise performance including observation and viva, 5 marks for record.) 30 marks (from the best of the two internal examinations, each being conducted at the end of a cycle/mid semester).	50 Marks	Single Valuation	**50% (25 marks) from End semester Examination and 50% (50 marks) on aggregate from Internal and End semester Examinations put together.**
4.	Design Thinking & Innovation Courses	50 Marks Design thinking phase-wise performance assessment	50 Marks	Single Valuation	**50% (25 marks) from End semester Examination and 50% (50 marks) on aggregate from Internal and End semester Examinations put together.**
5.	Skill Oriented Courses	50 Marks 20 marks (day-wise performance including observation and viva) 30 marks (from internal examinations at the end of the semester).	50 Marks	Single Valuation (Based on report and viva voce examination conducted by concerned teacher and a senior expert in the subject from the same department)	**50% (25 marks) from End semester Examination and 50% (50 marks) on aggregate from Internal and End semester Examinations put together.**

S. No	Type of Course	Continuous Internal Evaluation	End Semester Examination (3 hours)		Pass Criteria
			Max Marks	Evaluation	
6.	Non-Credit Mandatory courses	-	100 Marks	Single Valuation	**40% (40 Marks) from End Semester Examination. No marks or letter grade shall be allotted for all the non- credit mandatory courses.**
7.	Summer Internships / Community Service Project	-	100 Marks	Single Valuation Through an Internal committee (comprising of HoD, Supervisor and a senior faculty of the department) based on Report (50%), Presentation and Viva-voce (50%).	**50% (50 Marks) from End Semester Examination.**
8.	Project Work	50 Marks 25 marks (Two reviews each for 25 Marks based on the progress, through an Internal committee comprising of HoD, Project Supervisor and a senior faculty of the department. The final score is 1/3rd of the I Review and 2/3rd of the II Review) 25 marks (Given by the guide according to the given rubric	150 Marks	Single Valuation (based on the report, Presentation and Viva-voce examination).	**50% (75 marks) from End semester Examination and 50% (100 marks) on aggregate from Internal and End semester Examinations put together.**

Note 1: If a student misses both the mid examinations in an ongoing semester, then on satisfactory medical grounds, she is permitted to take a re-test before external examination of that semester based on either mid-I or mid-II syllabus and 80% of the marks will only be considered.

11. Valuation of Scripts:

For both single and double valuation, a chief examiner shall be appointed for each theory course to monitor the valuation process and evaluate at least 10% of scripts per bundle at random for which the marks awarded by the chief examiner shall be final.
In case of double valuation, in addition to the above,

i) If the difference between the first and second valuations is less than or equal to 10 marks (15% of 70 marks), the better of the two valuations shall be awarded.

ii) If the difference between the first and second valuations is more than 10 marks (15% of 70 marks), the chief examiner shall value the script. Out of the three valuations, the average of marks obtained in third valuation and the marks obtained nearer to third valuation out of first two valuations shall be considered.

12. Supplementary Examinations:

Supplementary examinations will be conducted only with the corresponding regular examinations.
If a student fails in Design Thinking and Innovation courses/Internship (Industrial or Research or Community Service Project) / Comprehensive Viva/ final semester Project Work, the student shall appear for supplementary examination as and when conducted.

13. Revaluation:

i) Revaluation of any theory subject shall be entertained within a stipulated period on payment of specified fee.

ii) There is no revaluation for any lab subjects/practical subjects/skill-oriented courses.

14. Withholding of Result:

The result of a student in a semester shall be withheld and not declared if the student has disciplinary action pending against her.

15. Promotion Rules:

A student shall fulfill the minimum attendance requirements in every semester for promotion to next semester, as mentioned in point 9.

16. Grading:

The marks obtained in each subject (out of 100 marks) will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.
Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.
Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Grades and Grade Points

Marks Range		Letter Grade		Grade Point
Theory (including Mandatory courses)	Practical, Drawing, Design Thinking, SoCs, Internships, Project			
> 90 to ≤ 100	> 90 to ≤ 100	O	Outstanding	10
> 80 to ≤ 90	> 80 to ≤ 90	A+	Excellent	9
> 70 to ≤ 80	> 70 to ≤ 80	A	Very Good	8
> 60 to ≤ 70	> 60 to ≤ 70	B+	Good	7
> 55 to ≤ 60	> 55 to ≤ 60	B	Above Average	6
≥ 50 to ≤ 55	≥ # 50 to ≤ 55	C	Average	5
≥ *40 to < 50	-	P	Pass	4
< 40	-	F	Fail	0
		Ab	Absent	0

* Pass mark for Theory courses, # Pass mark for all other courses

Calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i) The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$SGPA = \Sigma (C_i \times G_i) / \Sigma C_i$$

where, C_i is the number of credits of the i^{th} subject and G_i is the grade point scored by the student in the i^{th} course

ii) The CGPA will be computed in the same manner as taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \Sigma (C_i \times S_i) / \Sigma C_i$$

where S_i is the SGPA of the i^{th} semester and C_i is the total number of credits in that semester. CGPA is calculated from II semester onwards up to the final semester, considering all the courses offered from the First semester onwards.

iii) Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts. CGPA is calculated for those who clear all the courses including present semester.

iv) While computing the SGPA/CGPA, the subjects in which the student is awarded Zero grade points will also be included.

v) A candidate has to secure a minimum of 5.0 SGPA for a pass in each semester.

17. Award of Degree:

A. Eligibility for the award of Degree/ Degree with Minor:

A student shall be eligible for the award of the B.Tech. Degree/ B.Tech. Degree with Minor if she fulfills the following conditions:

i) Register and successfully complete all the courses prescribed within the stipulated period.

ii) Earn 160 credits for B.Tech. degree/ earn 12 credits within 160 credits for B.Tech. with Minor degree and pass in all non-credit mandatory courses.
iii) Secure satisfactory grade in social activity.
iv) No disciplinary action is pending against her.
v) Pays the prescribed fee for all the years.

B. Eligibility for the award of degree with Honors:
A student shall be eligible for the award of degree with Honors in a specific specialization if she satisfies conditions i, iii, iv, v cited above (17.A) and earns 15 credits in addition to 160 Credits.

The student eligible for award of B.Tech. degree, shall be placed in one of the following:

Class Awarded	CGPA Secured
First Class with Distinction	**≥ 7.0** (within four years for regular and three years for lateral entry without any supplementary appearance in any semester)
First Class	**≥ 6.0 and < 7.0**
Second Class/ Pass	**≥ 5.0 and < 6.0**

CGPA to Percentage of Marks: Equivalent percentage of marks = **CGPA*10**

18. Gap Year - concept of Student Entrepreneur in Residence:

Outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after I year / II year / III year to pursue entrepreneurship full time. This period shall be counted for the maximum time for graduation. An evaluation committee at the college level shall be constituted to evaluate the proposal submitted by the student and the committee shall decide on permitting the student for availing the Gap Year.

19. Curricular Framework for Mandatory Internships:

i) Two summer internships each with a minimum of six weeks duration, done at the end of IV and VI semesters, respectively are mandatory. The internship can be done by the students at local industries, Govt. Organizations, Construction agencies, Hydel and thermal power projects and in software MNCs.
ii) Evaluation of the summer internships shall be through the Departmental Committee comprising the Head of the Department as chairman and two faculty of the department including the Supervisor. A student will be required to submit a summer internship report to the concerned department and appear for an oral presentation before the departmental committee. The report and the oral presentation shall carry 40% and 60% weightages, respectively.
iii) In the final semester, the student shall mandatorily undergo internship and parallelly she shall work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report on the work carried out. The project work shall be evaluated with an external examiner.
iv) The student internship programs shall be facilitated and monitored through a college level

committee with three senior faculty members including supervisor. Completion of internships is mandatory, if any student fails to complete internship, she will not be eligible for the award of degree. In such cases, the student shall repeat and complete the internship.

20. Curricular Framework for Skill oriented Courses (SoCs):

i) Out of the five skill courses two shall be skill-oriented courses from the same domain and shall be completed in the second year. Of the remaining 3 skill courses, one shall necessarily be a soft skill course and the remaining 2 shall be skill-advanced courses either from the same domain or Job oriented skill courses, which can be of inter disciplinary nature.

ii) The student can choose either the skill courses being offered by the department or to choose a certificate course being offered by industries / Professional bodies / APSSDC or any other accredited bodies as approved by the concerned BoS.

iii) If a student chooses to take a Certificate Course offered by Industries / Professional bodies / APSSDC or any other accredited bodies, in lieu of the skill advanced course offered by the department, the credits shall be awarded to the student upon producing the Course Completion Certificate from the agency / professional bodies as approved by the BoS.

iv) If a student prefers to take a certificate course offered by external agency, attendance shall be computed by excluding the skill course in all the calculations of mandatory attendance requirements upon producing a valid certificate as approved by the concerned HoD. The student is deemed to have fulfilled the attendance requirement of the course and acquire the credits assigned to the course.

v) The grades / marks given for a course by external agencies will be converted to the equivalent grades / marks of GVPCEW(A).

21. Community Service Project (Experiential learning through community engagement):

i) Every student should put in a minimum of 180 hours for the Community Service Project during the summer vacation.

ii) Each class/section should be assigned with a mentor

iii) Specific Departments concentrate on their major areas of concern.

iv) A log book has to be maintained by each of the student, where the activities undertaken / involved to be recorded.

v) The log book has to be countersigned by the concerned mentor/faculty incharge.

vi) Evaluation will be done based on the active participation of the student and grade will be awarded by the mentor/faculty member.

vii) The final evaluation will be reflected in the grade memo of the student.

viii) The Community Service Project should be different from the regular programmes of NSS / NCC / Green Corps/Red Ribbon Club, etc.

ix) Minor project report should be submitted by each student. An internal Viva will be conducted by a committee constituted by the principal of the college.

22. Curricular Framework for Minor Programme:

To promote interdisciplinary knowledge among the students, the students admitted into B.Tech. in a major stream/branch are eligible to obtain degree in Minor in another stream.

i) The Minor program requires completion of 12 credits in Minor stream chosen.

ii) Two courses for 06 credits related to Minor are to be pursued compulsorily for the minor degree, but maybe waived for students who have done similar/equivalent courses. If waived for a student, then the student must take an extra elective course in its place. It is recommended that students should complete the compulsory courses (or equivalents) before registering for the electives.

iii) Electives (minimum of 2 courses) to complete a total of 12 credits.

Note: A total of 4 (four) Open Electives are offered in the curriculum. A student can complete the requirement for Minor by opting for the courses offered through various verticals/tracks under Open Electives.

- **No entry conditions on CPGA/ backlogs.**

23. Curricular Framework for Honors:

i) Students of a department / discipline are eligible to opt for Honors Programme offered by the same department / discipline and can select the additional and advanced courses from their respective branch.

ii) The enrolment of student into Honors is based on the CGPA obtained in the major degree program. CGPA shall be taken up to III semester in case of regular entry students and only III semester in case of lateral entry students. Students having 7.0 CGPA without any backlog subjects will be permitted to register for Honors.

iii) A student is permitted to register for Honors in IV semester after the results of III Semester are declared and students may be allowed to take maximum two subjects per semester pertaining to the Honors from IV Semester onwards.

iv) Attendance will not be monitored for MOOC courses. Students have to acquire a certificate from the agencies approved by the BoS with grading or marks or pass/fail. If the MOOC course is a pass/fail course without any grades, the grade shall be assigned as per the recommendations of the Academic Council.

v) It is the responsibility of the student to acquire / complete prerequisites before taking the respective course. The courses offered in each pool shall be domain specific courses and advanced courses. Each pool can have theory as well as laboratory courses. If a course comes with a lab component, that component has to be cleared separately.

vi) If a student has already studied any course from the list prescribed for B.Tech (Honors), she shall be permitted to choose any other course listed under professional electives of the respective B.Tech. programme.

vii) If a student drops or is terminated from the Honors program, the additional credits so far earned cannot be converted into open or core electives; they will remain extra. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

viii) Transfer of credits from Honors to regular B. Tech degree and vice-versa will not be permitted.

ix) Honors is to be completed simultaneously with a Major degree program.

Registration for Honors:

i) The students having **7.0 CPGA** without backlog subjects will be permitted to register for Honors.

ii) The eligible and interested students shall apply through the Head of the Department (HOD) of her parent department. The whole process should be completed within one week before the start of every semester. Selected students shall be permitted to register for the courses under Honors.

iii) The selected students shall submit their willingness to the principal through her parent department offering Honors. The parent department shall maintain the record of student pursuing the Honors.

iv) The students enrolled in the Honors courses will be monitored continuously. An advisor/mentor from parent department will be assigned to a group of students to monitor the progress.

v) If a student is detained due to lack of attendance either in major or in Honors, registration shall be cancelled.

vi) Honors is to be completed simultaneously with B.Tech. programme.

24. Other Common guidelines for Honors / Minor Programme:

i) A student shall be permitted only to register either for Honors or for Minor programme.

ii) Administration reserves the right to decide on the minimum enrolments for offering Honors / Minor program by the department. If a minimum enrolments criterion is not met, then the students may be permitted to register for the equivalent MOOC courses as approved in BoS.

iii) A student shall be permitted to register for Honors program at the beginning of IV semester subject to a maximum of two additional courses per semester, provided that the student must have acquired 7.0 CGPA upto the end of II semester without any backlogs. In case the III semester results are declared after the commencement of the IV semester, and if a student fails to acquire 7.0 CGPA upto III semester or failed in any of the courses, her registration for Honors program stands cancelled and she shall continue with the regular Programme. The CGPA of 7.0 has to be maintained in the subsequent semesters of regular B.Tech. programme, without any backlog in order to keep the registration for Honors programme active.

iv) The admission into Honors / Minor shall be strictly on the merit basis only. In case of a tie the GPA secured in the core courses shall be taken into consideration.

v) A student shall be permitted to appear for the end semester examinations, provided she puts up a minimum attendance of 75% in each course registered. However, condonation for shortage of attendance between 65-74% may be given on medical grounds. The student concerned will be permitted to take the end semester examination, on payment of condonation fee.

vi) The internal and end semester evaluation for Theory, Practical and Mini-Project shall be same as that of similar type of courses in regular B.Tech. programme.

vii) The Honors / Minor degree will be awarded only after successfully acquiring stipulated

Credits. A separate CGPA will be given for the Honors / Minor programme and no Class / Division will be awarded. Withdrawal from Honors / Minor programme is allowed in any semester.

viii) If a student drops or is terminated from the Honors program, the additional credits so far earned cannot be converted into free or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate).
In such cases, the student may choose between the actual grade or a "pass (P)" grade and choose to omit the mention of the course as per the following:

a) All the courses done under the dropped Honor will be shown in the transcript and
b) None of the courses done under the dropped Honor will be shown in the transcript (implementation shall be in line with the guidelines of APSCHE / affiliating University)

ix) In case a student
a) fails to meet attendance requirement in any subject registered under Honors programme or (ii) fails in any subject registered under Honors programme or
b) fails to meet the 7.0 CGPA requirement at any point after registration,
she will be dropped from the list of students eligible for degree with Honors and they will receive B.Tech. degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them (implementation shall be in line with the guidelines of APSCHE / affiliating University).

x) If a student gets detained due to attendance shortage / credit shortage in the regular programme, her admission in Honors shall stand cancelled.

xi) The Honors must be completed simultaneously with regular B.Tech. program within four years.

xii) The nomenclature and mention of title on the degree certificate for Honors / Minor will be in accordance with guidelines from the affiliating University.

25. Credit Transfer Policy and guidelines for courses under MOOCs (including SoCs):

i) Adoption of MOOCs is mandatory, as envisaged in the NEP 2020. As per University Grants Commission (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2016, the Institution allows up to a maximum of 20% of the total credits (i.e., 32 Credits out of a total 160 credits) from elective courses under MOOCs during B.Tech. programme. Every student shall mandatorily complete a minimum of one course under MOOCs.

ii) Each of the 2 credit / 3 credit courses under MOOCs shall be of minimum 12 weeks duration, respectively. One faculty in-charge will be nominated for each course to monitor the registration and progression of the student. Attendance will not be counted for courses under MOOCs.

iii) The Head of the Department shall notify the list of such courses in advance. The student has to pursue and acquire a certificate for a course under MOOCs from the organizations / agencies approved by the BoS in order to earn the credits.

iv) The students may also be permitted to register for a course under MOOCs ahead of the corresponding regular semester based on the start dates of course by external agencies.

v) If a course under MOOCs is not offered during the specified semester, the same or equivalent course under MOOCs may be offered in blended mode.

vi) If the external agency is unable to conduct examination or give grades/marks due to any unavoidable circumstances, the college shall conduct examination and give grades/marks.

vii) In case a student fails in any course under MOOCs offered by college in blended mode, she shall appear in supplementary examination as and when conducted by the college.

viii) In case a student fails in any course under MOOCs offered by external agency, she may be permitted to register for the same or equivalent or any other course approved in BoS.

ix) The grades / marks given for a course under MOOCs by external agencies will be converted to the equivalent grades / marks of GVPCEW(A).

x) If the external agency declares only Pass without any grade / marks for a course under MOOCs, the college will award minimum grade corresponding to Pass criteria.

26. Academic Bank of Credits (ABC):

The Institution will implement Academic Bank of Credits (ABC) inline with the Affiliating University to promote flexibility in curriculum as per NEP 2020 to

i) provide option of mobility for learners across the universities of their choice. In case of students seeking admission through transfer from other institutes, for the credits earned so far and available in the ABC, equivalences will be drawn with the Course structure in force as per the prevailing regulations and will be considered for transfer of credits as per the approvals of BoS and Academic Council. The decision of the Academic Council is final in case of any ambiguity.

ii) provide option to gain the credits through MOOCs from approved digital platforms.

iii) facilitate award of certificate/diploma/degree in line with the accumulated credits in ABC

iv) execute Multiple Entry and Exit system with credit count, credit transfer and credit acceptance from students' account.

27. Multiple Entry / Exit Option:

(a) **Exit Policy:**

The students can choose to exit the four-year programme at the end of the first / second / third year.

i) UG Certificate in (Field of study/discipline) - Programme duration: First year (first two semesters) of the undergraduate programme, 40 credits (39 credits at the end of I year and another course for 1 credit), followed by an additional exit 10-credit bridge course(s) lasting two months, including at least 6- credit job-specific internship/ apprenticeship that would help the candidates acquire job-ready competencies required to enter the workforce.

ii) UG Diploma (in Field of study/discipline) - Programme duration: First two years (first four semesters) of the undergraduate programme, 80.5 credits followed by an additional exit 10- credit bridge course(s) lasting two months, including at least 6- credit job-specific internship/ apprenticeship that would help the candidates acquire job-ready competencies required to enter the workforce.

iii) Bachelor of Science (in Field of study/discipline) i.e., B.Sc. Engineering in (Field of study/discipline)- Programme duration: First three years (first six semesters) of the undergraduate programme, 124 credits.

(b) Entry Policy:

Modalities on multiple entry by the student into the B.Tech. programme will be as per the directions of the affiliating University and regulatory authorities from time to time.

28. Student Transfers:

Student transfers shall be as per the guidelines issued by the Government of Andhra Pradesh and the concerned Universities from time to time.

General:

i) The academic regulations should be read as a whole for the purpose of any interpretation.

ii) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, Academic Council is final.

iii) The College may change or amend the Academic regulations or syllabi at any time as per the directions of the Academic Council and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College.

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ACADEMIC REGULATIONS
FOR STUDENTS ADMITTED THROUGH LATERAL ENTRY

The duration of the programme for the degree of B.Tech. for lateral entry students will be three academic years, with two semesters in each year. However, if a student cannot complete within 3 years, she can do so by taking more time but not more than 6 years from the year of first admission.

1. Structure of the Programme:

<table>
<tr><th>Semester</th><th colspan="2">Composition</th><th>Credits</th></tr>
<tr><td>III</td><td>5 Theory + 3 Labs + 1 skill Lab
[20-21.5 Credits]</td><td rowspan="2">Includes
Non-Credit Mandatory Courses
PEUHV & NCC/NSS/ES</td><td rowspan="2">41.5 Credits</td></tr>
<tr><td>IV</td><td>5 Theory + 2 Labs + 1 skill Lab
[20-21.5 Credits]</td></tr>
<tr><td colspan="4">Intern-I: 2 Months Community oriented Internship (CSP-Mandatory) during summer vacation</td></tr>
<tr><td>V</td><td>3 Theory + 2 Labs +
1 PE+ 1 OE + 1 skill course +
Internship-I [22-23.5 Credits]</td><td rowspan="2">Includes
Non-Credit Mandatory
Courses</td><td rowspan="2">43.5 Credits</td></tr>
<tr><td>VI</td><td>3 Theory + 3 Labs
+ 1 PE + 1 OE + 1 skill course
[20-21.5 Credits]</td></tr>
<tr><td colspan="4">Intern-II: 2 Months Industrial/Research Internship (Mandatory) during summer vacation</td></tr>
<tr><td>VII</td><td>3 PE + 2 OE +1 HSSE+1 skill
course + Industrial Internship-II
[22 credits]</td><td></td><td>22 Credits</td></tr>
<tr><td>VIII</td><td>Project work / Internship in
Industry
[14 credits]</td><td></td><td>14 Credits</td></tr>
<tr><td colspan="3">Total Credits for Lateral programme</td><td>121Credits</td></tr>
</table>

Non-credit Mandatory Courses: Environmental Sciences, Human Values & Professional Ethics, Indian Constitution, Essence of Indian Traditional Knowledge

2. Promotion Rules:

A student shall fulfill the minimum attendance requirements in every semester for promotion to next semester.

3. Minimum Academic Requirement for the award of degree:

A. Eligibility for the award of degree:

A student shall be eligible for the award of the B.Tech. degree/ B.Tech. degree with Minor if

she fulfills the following conditions:

i) Register and successfully complete all the courses prescribed within the stipulated period.
ii) Earn 121 credits for B.Tech. degree/ earn 12 credits within 121 credits for B.Tech. with Minor degree and pass in all non-credit mandatory courses
iii) Secure satisfactory grade in social activity
iv) No disciplinary action is pending against her
v) Pays the prescribed fee for all the years.

B. Eligibility for the award of degree with Honors:

A student shall be eligible for the award of degree with Honors in a specific specialization if she satisfies conditions i, iii, iv, v cited above (3.A) and earns 15 credits in addition to 121 Credits.

4. All other regulations shall be same as that of the regulations applicable to regular students.

General:

i) The academic regulations should be read as a whole for the purpose of any interpretation.
ii) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, Academic Council is final.
iii) The College may change or amend the Academic regulations or syllabi at any time as per the directions of the Academic Council and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College.

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TRANSITORY REGULATIONS
FOR RE-ADMITTED STUDENTS

i) When a student is detained due to lack of credits / shortage of attendance, she may be re-admitted after fulfillment of academic requirements and as and when the semester is offered. In such case, she will be in the academic regulations into which she is readmitted.

ii) Credit equivalences will be drawn for the students re-admitted into latest regulations from the earlier regulations. A Student has to register for the substitute / compulsory / pre-requisite courses identified by the respective Boards of Studies.

iii) The student has to register for substitute courses, attend the classes and pass in examination and earn the credits.

iv) The student has to register for compulsory courses, attend the classes and pass in examination

v) For the subject(s) failed in earlier semesters (before re-admission), the student has to acquire credits from the supplementary examinations as and when conducted.

vi) In the case of transferred students from other University / College, an equivalent course structure shall be prepared by the BoS of the respective department considering the suitable credits already acquired at the previous institution.

vii) The students detained in earlier Regulations (under JNTU-K affiliation) and to be readmitted into R-24 Regulations (under AU affiliation) shall also follow the above guidelines subject to the approval from both the Universities.

viii) The decision of the Principal is final on any other clarification in this regard.

General:

i) The academic regulations should be read as a whole for the purpose of any interpretation.

ii) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, Academic Council is final.

iii) The College may change or amend the Academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College.

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MALPRACTICES RULES
DISCIPLINARY ACTION FOR - IMPROPER CONDUCT IN EXAMINATIONS

S No	Nature of Malpractices/Improper conduct *If the candidate:*	Suggested Punishment
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellationof the performance in that subject only.
1. (b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, she will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connectionwith the examination.	The candidate who has impersonated shall be expelledfrom examination hall. The candidate is also debarredand forfeits the seat. The performance of the originalcandidate who has been impersonated, shall be cancelledin all the subjects of the examination (includingpracticals and project work) already appeared and shall not be allowed to appear for examinations of theremaining subjects of that semester/year. The candidateis also debarred for two consecutive semesters from classwork and all examinations. The continuation of thecourse by the candidate is subject to the academic regulations in connection with forfeiture of seat. If theimposter is an outsider, she will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation ofperformance in that subject and all the other subjects thecandidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjectsof that semester/year. The candidate is also debarred fortwo consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

S No	Nature of Malpractices/Improper conduct If the candidate:	Suggested Punishment
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requestinghim to award pass marks.	Cancellation of the performance in that subject.
.6	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in- charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects thecandidate(s) has (have) already appeared and shall notbe permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

S No	Nature of Malpractices/Improper conduct If the candidate:	Suggested Punishment
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Committee appointed by the Principal for further action and impose suitable punishment.	

Suitable punishment shall be awarded based on the recommendations of a committee constituted in this regard.

* * * * *

Principal
G V.P College of Engineering (a
Madhurawada
Visakhapatnam-5300

Ragging

Prohibition of ragging in educational institutions Act 26 of 1997

Salient Features

- Ragging within or outside any educational institution is prohibited.
- Ragging means doing an act which causes or is likely to cause Insult or Annoyance of Fear or Apprehension or Threat or Intimidation or outrage of modesty or Injury to a student.

	Imprisonment upto		Fine Upto
Teasing, Embarrassing and Humiliation	6 Months	+	Rs. 1,000/-
Assaulting or Using Criminal force or Criminal intimidation	1 Year	+	Rs. 2,000/-
Wrongfully restraining or confining or causing	2 Years	+	Rs. 5,000/-
Causing grievous hurt, kidnapping or Abducts or rape or committing unnatural offence	5 Years	+	Rs. 10,000/-
Causing death or abetting suicide	10 Months	+	Rs. 50,000/-

Ragging

ABSOLUTELY NO TO RAGGING

1. Ragging is prohibited as per Act 26 of A.P. Legislative Assembly, 1997.
2. Ragging entails heavy fines and/or imprisonment.
3. Ragging invokes suspension and dismissal from the College.
4. Outsiders are prohibited from entering the College and Hostel without permission.
5. Girl students must be in their hostel rooms by 7.00 p.m.
6. All the students must carry their Identity Cards and show them when demanded
7. The Principal and the Wardens may visit the Hostels and inspect the rooms any time.

ANNEXURE - III

ACADEMIC RULES AND REGULATIONS (R-24)

FOR M.TECH. PROGRAMMES

[Under Choice Based Credit System in line with NEP 2020]

[Effective from 2024-25 admitted batch)

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)
MADHURAWADA, VISAKHAPATNAM 530048
AFFILIATED TO ANDHRA UNIVERSITY, VISAKHAPATNAM

ACADEMIC REGULATIONS

FOR M.TECH. PROGRAMMES

(Under Choice Based Credit System effective from 2024-25 admitted batch)

These Regulations shall be called the "Gayatri Vidya Parishad College of Engineering for Women (Autonomous) Regulations- 2024 for the Award of M. Tech. Degree".

These regulations shall be applicable for students enrolling for M.Tech. Degree programmes at the Institute from Academic Year 2024-25.

Admission to the above program shall be made subject to the eligibility, qualifications and specialization as per the guidelines prescribed by the APSCHE, AICTE and Andhra University from time to time. The medium of instruction for course work and examinations at the Institute shall be English.

The duration of the programme for the Master of Technology degree will be two academic years, with two semesters in each year. However, if a student cannot complete within 2 years, she can do so by taking more time but not more than 4 years from the year of first admission.

1. Structure of the Programme:

Semester	No. of courses & Corresponding Credits		Credits
I	2 Theory + PE-I + PE-II + Research Methodology & IPR + Audit course+2 Core Lab	2*3 + 3 + 3 + 2 + 2*1.5	17
II	2 Theory + PE-III + PE-IV + Audit course + 2 Core Lab + 1 Mini Project with Seminar	2*3 + 3 + 3 + 2 *2+1.5	17
III	PE-V+OE+ Dissertation (Phase-I) + Industrial Training	1*3 + 1*3 + 10+2	18
IV	Dissertation (Phase-II)	16	16
		TOTAL	68

PE: Professional Elective; **OE**: Open Elective

The credits are allotted as:
1 Hr. Lecture (L) per week - 1 credit
1 Hr. Practical (P) per week - 0.5 credits.
Audit Courses carry no credits.

2. Registration:

A student shall register for courses in each semester at the beginning, from I semester onwards according to the choice provided and courses offered by the concerned department.

3. Attendance Requirements:

i) A student shall be eligible to appear for end semester examinations if she acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

- In the case of students who participate in activities like NSS, NCC, sports, intercollegiate tournaments conducted at National level/State Level/ University Level with prior approval of the Principal, the candidate may be deemed to have attended the college during the actual period of such activity, solely for the purpose of attendance.
- Participating in the seminar, workshop, conference with prior approval of the Principal, the candidate may be deemed to have attended the college during the actual period of such activity, solely for the purpose of attendance permission. The maximum period of such events is limited to 10 days.
- In the case of students admitted under special circumstances (late admission / transfer etc.,), the candidate shall attend at least 50% of the total classes held during semester and shall have attended at least 75% of the total classes held from the date of admission.

ii) Condonation for shortage of attendance in aggregate up to 10% (greater than 65% and less than75%) in each semester may be granted on medical grounds. A stipulated fee shall be payable to the college towards condonation of shortage of attendance.

iii) Students whose shortage of attendance is not condoned in any semester are detained and are not eligible to take their end semester examination of that class and their registration shall stand cancelled.

iv) A student will not be promoted to the next semester unless she satisfies the attendance requirements of the present semester, as applicable. They shall seek readmission and continue her course of study from that semester when offered next.

4. Method of Evaluation:

The performance of a student in each semester shall be evaluated through Continuous Internal Evaluation and End Semester Examination. The student shall earn the credits in the respective courses by obtaining at least the marks as specified in the pass criteria given below:

S.No	Type of Course	Continuous Internal Evaluation	End Semester Examination (3 hours)		Pass Criteria
			Max Marks	Evaluation	
1.	Professional core/ Professional Elective/ Open Elective/ Research Methodology & IPR Courses	30 Marks Evaluation process: 20 marks (Two internal tests each for 20 marks.) 10 marks (Two assessments 1 before mid1 and 1 before mid2 by at least any	70 Marks (Through a panel of paper setters)	Professional core (Double Valuation) and Professional Elective/ Open Elective/ Research Methodology & IPR Courses (Single Valuation)	**40% (28 marks) from End semester and 50% (50 marks) on aggregate from Internal and End semester Examination**

		two of the following methods each for 10 marks. (Assessment Methods: Assignment / Term paper / / seminar / Case study / Projects /Any other Teacher specific method). 2:1 weighted averaged marks with the higher score carrying a weightage of 2 shall be considered.			**put together.**
5.	Practical Courses	50 Marks 20 marks (day-wise performance including observation, viva & record) 30 marks (from internal examinations at the end of the semester).	50 Marks (Internal)	Single Valuation (Based on report of a lab activity-based project on the course conducted by concerned teacher and a senior expert in the subject from the same department)	**50% (25 marks) from End semester Examination and 50% (50 marks) on aggregate from Internal and End semester Examinations put together.**
6.	Non-credit Audit courses	100 Marks	-	Single Valuation	**40% (40 Marks) from End Semester Examination.** **No marks or letter grade shall be allotted for all the non-credit Audit courses.**

7.	Mini Project with Seminar	100 Marks	-	Single Valuation Through an Internal committee (comprising of HoD, Supervisor and a senior faculty of the department) based on Report (50%), Presentation and Viva-voce (50%).	**50% (50 Marks) from Report, Presentation and Viva-voce.**
8.	Dissertation work Phase I & II	Phase I (100 marks) Phase II (30 marks) (details mentioned in point 5 g & h)	Phase II (70 marks)	Single Valuation Through a board consisting of the supervisor, Head of the Department and the external examiner	**PASS in both Phase I & II**

Note 1: If a student misses both the mid examinations in an ongoing semester, then on satisfactory medical grounds, she is permitted to take a re-test before external examination of that semester based on either mid-I or mid-II syllabus and 80% of the marks will only be considered.

4.1 (a) Valuation of scripts:

For both single and double valuation, a chief examiner shall be appointed for each theory course to monitor the valuation process and evaluate atleast 10% of scripts per bundle at random for which the marks awarded by the chief examiner shall be final.
In case of double valuation, in addition to the above,

i) If the difference between the first and second valuations is less than or equal to 10 marks (15% of 70 marks), the better of the two valuations shall be awarded.

ii) If the difference between the first and second valuations is more than 10 marks (15% of 70 marks), the chief examiner shall value the script. Out of the three valuations, the average of marks obtained in third valuation and the marks obtained nearer to third valuation out of first two valuations shall be considered.

4.1 (b) Revaluation:

i) Revaluation of any theory subject shall be entertained within a stipulated period on payment of specified fee.

ii) There is no revaluation for any lab subjects/practical subjects/skill-oriented courses.

4.2 Audit Courses:

A student shall register for the audit courses (as approved in BoS) in online (MOOCs) / offline mode and appear for examination to be conducted by the college.

i) The students may be permitted to register for audit course under MOOCs ahead of the corresponding regular semester based on the start dates of course by external agencies.

ii) If the audit course is not offered under MOOCs during the specified semester, the same or its

equivalent course under MOOCs may be offered in blended mode.

4.3 Pedagogy training / Industrial training:

Training shall be for a period of at least 4 weeks during III semester and a report has to be submitted. The assessment shall be carried out for 100 marks by an internal evaluation committee comprising Head of the Department, Faculty advisor and another faculty of the department.

4.4 Supplementary examinations:

Supplementary examinations will be conducted only with the corresponding regular examinations.

If a student fails in final semester Project Work, the student shall appear for supplementary examination as and when conducted.

5. EVALUATION OF DISSERTATION WORK:

Every candidate shall be required to submit the dissertation work after taking up a topic approved by the Departmental Research Committee (DRC).

i) A Departmental Research Committee (DRC) shall be constituted with HoD as Chairman, two senior faculty (at least one from each specialization) as members along with the supervisor to oversee the progress of the dissertation work from selection of topic to submission.

ii) A Central Research Committee (CRC) shall be constituted with a Professor as Chair Person and one representative from each department nominated by the Principal.

iii) Registration of Dissertation Work: A candidate shall register for the Dissertation work at the beginning of the second year, only after satisfying the attendance requirement of all the courses up to II semester. The duration of the dissertation work is for two semesters.

iv) After satisfying 5c, a candidate has to submit, in consultation with the supervisor, the title, objective and plan of action of dissertation work to the DRC for its approval. Only after obtaining the approval of DRC, the student can initiate the dissertation work.

v) Change of topic of the dissertation work or supervisor, if necessary, shall be with the approval of the DRC. In such case, the date of registration for the dissertation work shall be the date of change of Supervisor or topic.

vi) Evaluation of the dissertation work shall be done in two phases, one at the end of the III Semester and the other during the IV Semester.

vii) The evaluation of the dissertation work (Phase-I) at the end of III semester shall be carried out through DRC1 for 100 marks based on the presentation made by the student on the topic selected, literature survey and the progress of the work. The student shall PASS in dissertation work (Phase-I) by securing at least 50 marks. Otherwise, the student shall reappear for DRC1 with improvised work to secure PASS. Only those students who secure a PASS in dissertation work (Phase-I) shall be permitted to proceed for the dissertation work (Phase-II) in IV semester.

viii) The evaluation of the dissertation work (Phase-II) during IV semester shall be carried out for a total of 100 marks through DRC2 (10 marks), DRC3 (10 marks), CRC (10 marks) and final viva-voce examination (70 marks).

ix) A candidate shall be permitted to submit her dissertation only after acquiring credits of

all theory and practical course with the approval of CRC but not earlier than 40 weeks from the date of registration of the Dissertation work. The candidate shall make an oral presentation before the CRC and after the approval by CRC, plagiarism check shall be conducted for the Dissertation (Similarity Index shall not exceed 30%) and shall submit a draft copy to the Principal through the concerned Head of the Department.

x) Three copies of the dissertation certified by the Supervisor shall be submitted in the department after approval by the CRC.

xi) For the purpose of adjudication of the dissertation, an external examiner shall be selected by the Principal or his nominee from a panel of examiners in the program specialization proposed and approved in the BoS meeting.

xii) The final evaluation of dissertation (Phase-II), i.e., viva-voce examination, for 50 marks, shall be conducted by a board consisting of the supervisor, Head of the Department and the external examiner.

xiii) A student is deemed to be passed in dissertation (Phase-II) of IV semester, if he secures at least 25 marks (50%) in the final viva-voce examination and at least 50 marks (50%) out of a total 100 marks through DRC2, DRC3, CRC, and final viva-voce examination. If a student fails in Dissertation (Phase-II), he/she shall revise and resubmit the dissertation, in a time frame prescribed by the CRC.

xiv) The overall Dissertation Grade Point Average (DGPA), shall be computed based on the grade points secured in Phase-I (III semester) and Phase-II (IV semester) as:

xv) $DGPA = \Sigma(Ci \times Gi) / \Sigma Ci$

xvi) where Ci is the number of credits of the ith phase and Gi is the grade point scored by the student in the ith phase.

6. ACADEMIC REQUIREMENTS:

i) A student shall secure a PASS in all courses (except in audit courses) and earn 68 credits to be eligible for the award of the M.Tech. degree.

ii) A student shall register for the audit courses (as approved in BoS) in online / offline mode and appear for examination to be conducted by the college.

7. GRADING SYSTEM:

Absolute grading system shall be followed for the award of grades.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Based on the marks secured, a Letter Grade is awarded as per the following:

Grades and Grade Points

Marks Range		Letter Grade		Grade Point
Theory (including Mandatory courses)	Practical, Drawing, Design Thinking, SoCs, Internships, Project			
> 90 to ≤ 100	> 90 to ≤ 100	O	Outstanding	10
> 80 to ≤ 90	> 80 to ≤ 90	A+	Excellent	9
> 70 to ≤ 80	> 70 to ≤ 80	A	Very Good	8
> 60 to ≤ 70	> 60 to ≤ 70	B+	Good	7
> 55 to ≤ 60	> 55 to ≤ 60	B	Above Average	6
≥ 50 to ≤ 55	≥ # 50 to ≤ 55	C	Average	5
≥ *40 to < 50	-	P	Pass	4
< 40	-	F	Fail	0
		Ab	Absent	0

* Pass mark for Theory courses, # Pass mark for all other courses

Calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i) The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$SGPA = \Sigma (Ci \times Gi) / \Sigma Ci$$

where, Ci is the number of credits of the ith subject and Gi is the grade point scored by the student in the ith course

ii) The CGPA will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \Sigma (Ci \times Si) / \Sigma Ci$$

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester. CGPA is calculated from II semester onwards up to the final semester, considering all the courses offered from the First semester onwards.

iii) Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts. CGPA is calculated for those who clear all the courses including present semester.

iv) While computing the SGPA/CGPA, the subjects in which the student is awarded Zero grade points will also be included.

v) A candidate has to secure a minimum of 6.0 SGPA for a pass in each semester.

The award of CLASS / DIVISION is as per the following:

Class Awarded	CGPA Secured
First class with distinction	≥ 7.0 (within two years and without any supplementary appearance in any semester)
First class	≥ 6.0 and < 7.0

CGPA to Percentage of Marks: Equivalent percentage of marks = **CGPA*10**

8. AWARD OF M.TECH. DEGREE:

A student shall be declared eligible for the award of the M.Tech. degree, if she pursues the course of study and satisfies the following:

i) Earn 68 credits in not less than two academic years and not more than four academic years from the year of first admission.
ii) Earn a minimum of 6.0 CGPA from all courses.
iii) No disciplinary action pending against her.
iv) Pays the prescribed fee for all the years.

9. WITHHOLDING OF RESULT:

The result of a student in a semester shall be withheld and not declared if the student has disciplinary action pending against her.

TRANSITORY REGULATIONS

i) When a student is detained due to lack of credits / shortage of attendance, she may be re-admitted after fulfillment of academic requirements and as and when the semester is offered. In such case, she shall be in the academic regulations into which she is readmitted.

ii) Credit equivalences shall be drawn for the students re-admitted into latest regulations from the earlier regulations. A Student has to register for the substitute / compulsory / pre-requisite courses identified by the respective Boards of Studies.

iii) The student has to register for substitute courses, attend the classes and pass in examination and earn the credits.

iv) The student has to register for compulsory courses, attend the classes and pass in examination.

v) For the subject(s) failed in earlier semesters (before re-admission), the student has to acquire credits from the supplementary examinations as and when conducted.

vi) In case of transferred students from other University / College, an equivalent course structure shall be prepared by the BoS of the respective department considering the suitable credits already acquired at the previous institution.

vii) The decision of the Principal will be final on any other clarification in this regard.

General:

i) The academic regulation should be read as a whole for the purpose of any interpretation.

ii) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, Academic Council is final.

iii) The college may change or amend the academic regulations or syllabi from time to time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

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MALPRACTICES RULES
DISCIPLINARY ACTION FOR - IMPROPER CONDUCT IN EXAMINATIONS

S No	Nature of Malpractices/Improper conduct	Suggested Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellationof the performance in that subject only.
1. (b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, she will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connectionwith the examination.	The candidate who has impersonated shall be expelledfrom examination hall. The candidate is also debarredand forfeits the seat. The performance of the originalcandidate who has been impersonated, shall be cancelledin all the subjects of the examination (includingpracticals and project work) already appeared and shall not be allowed to appear for examinations of theremaining subjects of that semester/year. The candidateis also debarred for two consecutive semesters from classwork and all examinations. The continuation of thecourse by the candidate is subject to the academic regulations in connection with forfeiture of seat. If theimposter is an outsider, she will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation ofperformance in that subject and all the other subjects thecandidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjectsof that semester/year. The candidate is also debarred fortwo consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

S No	Nature of Malpractices/Improper conduct	Suggested Punishment
	If the candidate:	
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
.6	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

S No	Nature of Malpractices/Improper conduct If the candidate:	Suggested Punishment
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Committee appointed by the Principal for further action and impose suitable punishment.	

Suitable punishment shall be awarded based on the recommendations of a committee constituted in this regard.

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Principal
V.P College of Engineering for Wo
Madhurawada
Visakhapatnam-530048

Ragging

Prohibition of ragging in educational institutions Act 26 of 1997

Salient Features

- Ragging within or outside any educational institution is prohibited.
- Ragging means doing an act which causes or is likely to cause Insult or Annoyance of Fear or Apprehension or Threat or Intimidation or outrage of modesty or Injury to a student.

	Imprisonment upto		Fine Upto
Teasing, Embarrassing and Humiliation	6 Months	+	Rs. 1,000/-
Assaulting or Using Criminal force or Criminal intimidation	1 Year	+	Rs. 2,000/-
Wrongfully restraining or confining or causing	2 Years	+	Rs. 5,000/-
Causing grievous hurt, kidnapping or Abducts or rape or committing unnatural offence	5 Years	+	Rs. 10,000/-
Causing death or abetting suicide	10 Months	+	Rs. 50,000/-

Ragging

ABSOLUTELY NO TO RAGGING

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4. Outsiders are prohibited from entering the College and Hostel without permission.
5. Girl students must be in their hostel rooms by 7.00 p.m.
6. All the students must carry their Identity Cards and show them when demanded
7. The Principal and the Wardens may visit the Hostels and inspect the rooms any time.

DEPARTMENT BASIC SCIENCES AND HUMANITIES (MATHEMATICS)

Minutes of 2nd meeting of the Board of Studies in the Department of Basic Sciences and Humanities in Mathematics held on 4th April 2025 (Friday) at 10:00AM in hybrid mode.

The meeting of the Board of Studies in Mathematics - BS&H department of Gayatri Vidya Parishad College of Engineering for Women is held on 4th April 2025 (Friday) from 10:00AM onwards to finalize the syllabi of the 2nd year (1st and 2nd semesters) and 4th year (1st semester) courses of all B.Tech Programs and 3rd semester course of M.Tech programs offered by the Department of Basic Sciences and Humanities (Mathematics) under the regulations R – 24 from the academic year 2024-25 onwards.

Members Present:

Prof. K L Sai Prasad – Chairperson

External Members:

1	Prof P A Lakshmi Narayana Professor, Dept of Mathematics IIT – Hyderabad	Subject Expert	offline
2	Prof. K N S Kasi Viswanadham Professor, Dept of Mathematics NIT - Warangal	Subject Expert	offline
3	Prof. Ch. Santhi Sundar Raj Dept of Engineering Mathematics AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	offline
4	Dr. A R J Srikanth Director Databrew Technologies Pvt Ltd	Industry Representative	offline
5	Anitha Chiluvuri Senior Member of Technical Staff (SMTS) Oracle	College Alumni	online
6	Mr. Anil Kumar Paluri Assistant Vice President Bank of America	Expert for Special Courses	offline

Internal Members:

1	Prof. G. Sudheer	Professor, Vice Principal	offline
2	Dr. A. Suseelatha	Assistant Professor	Offline
3	Dr. B. Bharathi	Assistant Professor	offline
4	Dr. A. Kameswara Rao	Assistant Professor	offline
5	Mr. SSVD Prakash Vepa	Assistant Professor	Online
6	Dr. T Poorna Kantha	Assistant Professor	offline
7	Ms. D S S S Ranjani	Assistant Professor	offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies in Mathematics – BS&H department and requested to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B.Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B.Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B.Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B.Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of Basic Sciences and Humanities (Mathematics) commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech and M.Tech programs under R-24 regulations, the Board collectively agreed to implement the proposed courses across various B.Tech and M.Tech programs.

The Board unanimously resolved the following:

Item-1 : Approval of the syllabus for the courses offered to II year of B.Tech Program

Resolution No: GVPCEW(A)/BOS-2/ BOS/MATHEMATICS-BS&H/2025/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Complex Variables and Statistical Methods" offered to the EEE branch in the II year I Semester – Annexure-I.
2. The proposed syllabus for the course titled "Complex and Fourier Analysis" offered to the ECE branch in the II year I Semester – Annexure-II.
3. The proposed syllabus for the course titled "Discrete Mathematical Structures" offered to the CSE, CSE[AI-ML], IT branches in the II year I Semester – Annexure-III.
4. The proposed syllabus for the course titled "Probability and Statistics" offered to the CSE, CSE[AI-ML], IT branches in the II year II Semester – Annexure-IV.

Item-2: Approval of the syllabus for the course offered under HSS Elective for IV year of B.Tech Program

Resolution No: GVPCEW(A)/BOS-2/ BOS/MATHEMATICS-BS&H/2025/2

It is resolved to recommend to the Academic Council that the following HSS Elective course offered for all B.Tech Programs to be effective from 2024 admitted batch onwards for approval

1. The proposed syllabus for the course titled "Operations Research" offered to ECE, EEE, CSE, CSE [AI-ML], IT branches in the IV year I Semester – Annexure-V

Item-3 : Approval of the syllabus for the course offered under Open elective course for III semester of M.Tech Program

Resolution No: GVPCEW(A)/BOS-2/ BOS/MATHEMATICS-BS&H/2025/3

It is resolved to recommend to the Academic Council that the following Elective course offered for M.Tech Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Optimization Techniques" offered to M.Tech CSE (Data Science) & ECE (VLSI Design and Embedded Systems) Program in the III Semester – Annexure-VI.

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Prof. K L Sai Prasad	Chairperson, BoS and Head, Dept of BSH	
Prof. G. Sudheer	Professor, Vice Principal	
Dr. A. Suseelatha	Assistant Professor	
Dr. B. Bharathi	Assistant Professor	
Dr. A. Kameswara Rao	Assistant Professor	
Mr. SSVD Prakash Vepa	Assistant Professor	
Dr. T Poorna Kantha	Assistant Professor	
Ms. D S S S Ranjani	Assistant Professor	
Prof P A Lakshmi Narayana	Subject Expert	
Prof. K N S Kasi Viswanadham	Subject Expert	
Prof. Ch. Santhi Sundar Raj	Vice Chancellor's Nominee	
Dr. A R J Srikanth	Industry Representative	
Anitha Chiluvuri	College Alumni	-
Mr. Anil Kumar Paluri	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
ADHURAWADA VISAKHAPATNAM 530 049

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF PHYSICS - BS&H

Minutes of 1st meeting of the Board of Studies in Physics- BS&H department on 3rd August 2024 (Saturday) at 1 PM in hybrid mode.

The meeting of the Board of Studies in Physics- BS&H department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024 (Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs offered by the Department of Physics- BS&H under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr K L Sai Prasad - Chairperson

External Members:

1	Dr G Padmaja Rani Professor, Dept of Physics JNTU-K, Kakinada	Subject Expert	ONLINE
2	Dr R Arun Kumar, Assistant Professor, Dept of Physics NIT-AP, Andhra Pradesh	Subject Expert	ONLINE
3	Dr S Srinivasa Rao, Professor, Dept of Physics AU College of Science and Technology, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
4	Dr Y Purushotham, Scientist Centre for Materials for Electronics Technology (C-MET), Hyderabad	Industry Representative	
5	Ms K Hrudaya, Team Lead, CAPGEMINI	College Alumni	
6	Dr K V Ramesh, Professor, Dept of Physics GITAM University, Visakhapatnam	Expert for Special Courses	

Internal Members:

1	Dr V S Jahnavi	Member	medical leave
2	Mr V V V Satyanarayana	Member	
3	Dr Ch S Lakshmi	Member	Ch. S. Lakshmi
4	Dr B Rajesh Babu	Member	

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B.Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of Physics – BS&H started with a welcome note by the Chairperson wherein she presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Physics – BS&H for B.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/ PHYSICS-BS&H/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B. Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "ENGINEERING PHYSICS" offered to the branches **ECE, EEE & CSE[AI&ML]** in the I year I Semester – Annexure-1
2. The proposed syllabus for the course titled "ENGINEERING PHYSICS LAB" offered to the branches **ECE, EEE & CSE[AI&ML]** in the I year I Semester – Annexure-2
3. The proposed syllabus for the course titled "ENGINEERING PHYSICS" offered to the branches **CSE & IT** in the I year II Semester – Annexure-3
4. The proposed syllabus for the course titled "ENGINEERING PHYSICS LAB" offered to the branches **CSE & IT** in the I year II Semester – Annexure-4

Resolution No: GVPCEW(A)/BOS/PHYSICS-BS&H/2024/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr K.L. SAI PRASAD	Chairman, BoS and Head, Dept of BS&H	
Dr V S Jahnavi	Member - Faculty	Medical Leave
Mr V V V Satyanarayana	Member - Faculty	
Dr Ch S Lakshmi	Member - Faculty	
Dr B Rajesh Babu	Member - Faculty	
Dr G Padmaja Rani	Subject Expert	ONLINE
Dr R Arun Kumar	Subject Expert	ONLINE
Dr S Srinivasa Rao	Vice Chancellor's Nominee	
Dr Y Purushotham	Industry Representative	
Ms K Hrudaya	College Alumni	
Dr K V Ramesh	Expert for Special Courses	

Chairperson , BoS

DEPARTMENT OF BASIC SCIENCE& HUMANITIES-ENVIRONMENTAL SCIENCE

Minutes of 2nd meeting of the Board of Studies in Chemistry, Department of Basic Science & Humanities on 29rd March 2025 (Saturday) at 11.00 AM in hybrid mode.

The meeting of the Board of Studies in Chemistry – BS & H department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 29rd March 2025 (Saturday) from 11.00 AM onwards to finalize the syllabi of the second year (1st semester and 2nd semester) course of all B. Tech Programs offered by the Department of Chemistry- Basic Science & Humanities under the regulations R-2024 from the academic year 2024-25 onwards.

Members Present:

Dr. K. L. Sai Prasad - Chairperson

External Members:

1	Dr. Someswara Rao S Associate Professor Department of Chemistry IIT-Tirupathi	Subject Expert	on line
2	Dr. Suresh Babu Kalidindi Associate Professor Department of Chemistry Central Tribal University of AP, Vizianagaram	Subject Expert	on line
3	Prof. K. Basavaiah Department of Chemistry College of Science & Technology Andhra University Visakhapatnam	Vice-Chancellor's Nominee	offline
4	Ms. M Santhoshi Rupa Associate Manager Department of Manufacturing Compliance Pfizer Health Care India Pvt Ltd Lemarthy Village, Parawada Mandal Visakhapatnam	Industry Representative	offline
5	Ms. Syed Suhana Amazon Web Services Bangalore	College Alumni	off-line
6	Mr.Akasapu Raviteja Senior Chemist Titanish Laboratories, Chodavaram Vizianagram	Expert for Special Courses	off-line

Internal Members:

1	Dr. Prava Rani Nanda Assistant Professor Department of Chemistry GVPCEW (A)	Faculty Members of the Department	Offline
2	Dr. P. Srinivasa Rao Assistant Professor Department of Chemistry GVPCEW (A)	Faculty Members of the Department	Off-line
3	Mr. S. Ashok Assistant Professor Department of Chemistry GVPCEW (A)	Faculty Members of the Department	Off-line

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B. Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B. Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B. Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B. Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of Electronics and Communication Engineering commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, 3rd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech program under R-24 regulations, the Board collectively agreed to implement the proposed courses across various B.Tech programs.

The Board unanimously resolved the following

Item-1:

Resolution No: GVPCEW(A)/BOS-2/Chemistry-BS&H/2025/1

It is resolved to recommend to the Academic Council that the following courses offered for B. Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Environmental Science"offered to the CSE & IT branch in the II year I Semester – Annexure-I.

2. The proposed syllabus for the course titled "Environmental Science" offered to the EEE, ECE & CSE (AI&ML) branch in the II year II Semester – Annexure-II.

Name of the Member	Designation	Signature
Dr. K. L. Sai Prasad	Chairperson, BoS and Head, Dept. of BS&H	
Mr. S. Ashok	Assistant Professor	
Dr. Prava Rani Nanda	Assistant Professor	
Dr. P. Srinivasa Rao	Assistant Professor	
Dr. S. Someswara Rao	Subject Expert	–
Dr. Suresh Babu Kalidindi	Subject Expert	–
Prof. K. Basavaiah	Vice Chancellor's Nominee	
Ms. M. Santhoshi Rupa	Industry Representative	
Ms. Syed Suhana	College Alumni	
Mr. Akasapu Raviteja	Expert for Special Courses	

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
ADHURAWADA VISAKHAPATNAM

Members Present:

Name of the Member	Designation	Signature
Dr. K. L. Sai Prasad	Chairperson, BoS and Head, Dept. of BS&H	
Mr. S. Ashok	Assistant Professor	
Dr. Prava Rani Nanda	Assistant Professor	
Dr. P. Srinivasa Rao	Assistant Professor	
Dr. S. Someswara Rao	Subject Expert	S. Someswara Rao
Dr. Suresh Babu Kalidindi	Subject Expert	
Prof. K. Basavaiah	Vice Chancellor's Nominee	
Ms. M. Santhoshi Rupa	Industry Representative	
Ms. Syed Suhana	College Alumni	
Mr. Akasapu Raviteja	Expert for Special Courses	

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES

Members Present

Name of the Member	Designation	Signature
Dr. K. L. Sai Prasad	Chairperson, BoS and Head, Dept. of BS&H	
Mr. S. Ashok	Assistant Professor	
Dr. Prava Rani Nanda	Assistant Professor	
Dr. P. Srinivasa Rao	Assistant Professor	
Dr. S. Someswara Rao	Subject Expert	
Dr. Suresh Babu Kalidindi	Subject Expert	Seresh
Prof. K. Basavaiah	Vice Chancellor's Nominee	
Ms. M. Santhoshi Rupa	Industry Representative	
Ms. Syed Suhana	College Alumni	
Mr. Akasapu Raviteja	Expert for Special Courses	

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
SVR COLLEGE OF ENGINEERING FOR WOMEN

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF ENGLISH- BS&H

Minutes of 2nd meeting of the Board of Studies in English, Department of Basic sciences and Humanities held on 3rd April 2025 (Thursday) at 9.00 a.m in hybrid mode.

The meeting of the Board of Studies in English - Department of Basic sciences and Humanities, Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd April 2025 (Thursday) from 9.00 a.m onwards to finalize the syllabi of the Third year (1st semester and 2nd semester) course of all B. Tech. programs offered by the Department of English- Basic sciences and Humanities under the regulations R-2024 from the academic year 2024-25 onwards.

Members Present:

Dr. K. L. Sai Prasad - Chairperson

External Members:

1	Dr. G Survana Lakshmi Professor, Dept of ELT School of English Language Education, EFL University, Hyderabad	Subject Expert	ONLINE
2	Dr. Chandreie Mukherjee Assistant Professor IIM Visakhapatnam	Subject Expert	OFFLINE
3	Dr. N Solomon Benny Dept. of English, College of Arts & Commerce AU College of Engineering, Visakhapatnam	Vice Chancellor's Nominee	N.S. Benny OFFLINE
4	Ms. Shameem Bhanu Executive Business Administrator, The Quantum AI	Industry Representative	ONLINE
5	Ms. Sai Sindhura Kuppili Gudiewire Developer PWC	College Alumni	ONLINE
6	Mr. Prasad Boya Director – Operations Quantum AI, Hi-tech City Hyderabad	Expert for Special Courses	ONLINE

Internal Members:

1	Dr. Ch. Alekya	Assistant Professor	Offline
2	Dr. V. V.L. Usha Ramani	Assistant Professor	Offline
3	Ms. B. Ramadevi	Assistant Professor	Offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested them to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B. Tech. Program in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B. Tech. Program regulations at GVPCEW (A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B. Tech. Degree with a Minor was to complete 12 credits within the 160-credit framework of the B. Tech. program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of English (Basic Sciences and Humanities) commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 3rd year and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech program under R-24 regulations, the Board collectively agreed to implement the proposed course across various B. Tech programs.

The Board unanimously resolved the following:

Item-1: Approval of syllabus of III B.Tech Program

Resolution No: GVPCEW(A)/BOS-2/BS&H/ENGLISH/2025/1

It is resolved to recommend to the Academic Council that the following course offered for B. Tech. program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Soft Skills" offered to the CSE(AI-ML), ECE , EEE Branches in the III year I Semester – Annexure-I
2. The proposed syllabus for the course titled "Soft Skills " offered to the CSE, IT Branches in the III year II Semester – Annexure-II

Resolution No: GVPCEW(A)/BOS/BS&H/ENGLISH/2025/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr. K. L. Sai Prasad	Chairman, BoS and Head, Dept of BS&H	
Faculty-1	Dr. Ch. Alekya	
Faculty-2	Dr.V.V.L.Usha Ramani	
Faculty-3	Ms.B.Ramadevi	
Dr.G Survana Lakshmi	Subject Expert	ONLINE
Dr.Chandreie Mukherjee	Subject Expert	
Dr. N Solomon Benny	Vice Chancellor's Nominee	
Ms. Shameem Bhanu	Industry Representative	ONLINE
Ms. Sai Sindhura Kuppili	College Alumni	ONLINE
Mr. Prasad Boya	Expert for Special Courses	ONLINE

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM-530 048

Members Present:

Name of the Member	Designation	Signature
Dr. K. L. Sai Prasad	Chairman, BoS and Head, Dept of BS&H	—
Faculty-1	Dr. Ch. Alekya	—
Faculty-2	Dr.V.V.L.Usha Ramani	—
Faculty-3	Ms.B.Ramadevi	—
Dr.G Survana Lakshmi	Subject Expert	G. Survana Lakshmi
Dr.Chandreie Mukherjee	Subject Expert	—
Dr. N Solomon Benny	Vice Chancellor's Nominee	—
Ms. Shameem Bhanu	Industry Representative	—
Ms. Sai Sindhura Kuppili	College Alumni	—
Mr. Prasad Boya	Expert for Special Courses	—

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
ADHURAWADA, VISAKHAPATNAM-530 040

Members Present:

Name of the Member	Designation	Signature
Dr.K L Sai Prasad	Chairman, BoS and Head, Dept of BS&H	—
Faculty-1	Dr.Ch.Alekya	—
Faculty-2	Dr.V.V.L.Usha Ramani	—
Faculty-3	Ms.B.Ramadevi	—
Dr.G Survana Lakshmi	Subject Expert	—
Dr.Chandreie Mukherjee	Subject Expert	—
Dr. N Solomon Benny	Vice Chancellor's Nominee	—
Ms. Shameem Bhanu	Industry Representative	—
Ms. Sai Sindhura Kuppili	College Alumni	KSaiSindhura
Mr. Prasad Boya	Expert for Special Courses	—

Chairman , BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
BASIC SCIENCES
V.R.S. COLLEGE OF ENGINEERING FOR WOMEN

Members Present:

Name of the Member	Designation	Signature
Dr. K. L. Sai Prasad	Chairman, BoS and Head, Dept of BS&H	
Faculty-1	Dr. Ch. Alekya	
Faculty-2	Dr.V.V.L.Usha Ramani	
Faculty-3	Ms.B.Ramadevi	
Dr.G Survana Lakshmi	Subject Expert	
Dr.Chandreie Mukherjee	Subject Expert	
Dr. N Solomon Benny	Vice Chancellor's Nominee	
Ms. Shameem Bhanu	Industry Representative	
Ms. Sai Sindhura Kuppili	College Alumni	
Mr. Prasad Boya	Expert for Special Courses	

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM-530 048

Members Present:

Name of the Member	Designation	Signature
Dr.K L Sai Prasad	Chairman, BoS and Head, Dept of BS&H	
Faculty-1	Dr.Ch.Alekya	
Faculty-2	Dr.V.V.L.Usha Ramani	
Faculty-3	Ms.B.Ramadevi	
Dr.G Survana Lakshmi	Subject Expert	
Dr.Chandreie Mukherjee	Subject Expert	
Dr. N Solomon Benny	Vice Chancellor's Nominee	
Ms. Shameem Bhanu	Industry Representative	
Ms. Sai Sindhura Kuppili	College Alumni	
Mr. Prasad Boya	Expert for Special Courses	

Chairman , BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
G V P COLLEGE OF ENGINEERING FOR WOMEN

DEPARTMENT OF MANAGEMENT STUDIES- BS & H

Minutes of the meeting of the Board of Studies in Management Studies, department of Basic Science and Humanities held on 29th March, 2025 (Saturday) at 10:00AM in hybrid mode.

The meeting of the Board of Studies in Management Studies- Basic Science and Humanities department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 29th March, 2025 (Saturday) from 10:00AM to finalize the syllabi of the 2nd, 3rd and 4th year (1st semester and 2nd semester) courses of all B.Tech Programs and 3rd semester courses of M.Tech programs offered by the Department of Management Studies- Basic Science and Humanities under the regulations R - 2024 from the academic year 2024-25 onwards.

Members Present:

Dr. K. L. Sai Prasad - Chairperson:

External Members:

1	Dr. A. Narasimha Rao Professor Department of Commerce and Management Studies Andhra University, South Campus, Waltair Junction, Visakhapatnam, Andhra Pradesh, India – 530003 Ph. No. 98483 77644 Email: addada@rediff.com	Subject Expert	offline
2	Dr.P. Venkata Rao Professor GVP College of Engineering (A) Visakhapatnam, Andhra Pradesh PIN:530 048, 8885043433 pvenkataro@gvpce.ac.in	Subject Expert	offline
3	Prof. P Venkateswarlu Dept of Commerce & Management Studies College of Arts & Commerce Andhra University, Visakhapatnam	Vice Chancellor's Nominee	offline
4	Sri P Rama Krishna IIM Udaipur Founder, Think plus.	Industry Representative	offline
5	Tsapala Srujana TCS Human Resource Business Partner	College Alumni	online.
6	Dr.K.V.V. Murali Someswararao Professor GVP college for Degree and PG courses	Expert for Special Courses	

Internal Members:

1	Ms. K. Vallisri KrishnaVeni	Assistant Professor	Offline
2	Dr.R.Neelima	Assistant Professor	Offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested them to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B.Tech & M.Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B.Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B.Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B.Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the department of Management Studies (Basic Science and Humanities) commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, 3rd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech and M.Tech programs under R-24 regulations, the Board collectively agreed to implement the proposed courses across various B.Tech and M.Tech programs.

The Board unanimously resolved the following:

Item-1 : Approval of syllabus of II, III & IV B.Tech Program

Resolution No: GVPCEW(A)/BOS/MANAGEMENT STUDIES-BS&H/2025/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Managerial Economics " offered to the CSE-(AIML) branch in the II year I Semester – Annexure-I

2. The proposed syllabus for the course titled "Managerial Economics " offered to the CSE, ECE, EEE,IT branch in the II year II Semester – Annexure-II

Item-2 : Approval of syllabus of B.Tech Program for HSS Electives

Resolution No: GVPCEW(A)/BOS/MANAGEMENT STUDIES-BS&H/2025/2

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Accounting and Finance for Engineers" offered to the CSM,CSE, ECE, EEE, IT branch in the IV year I Semester – Annexure-III
2. The proposed syllabus for the course titled "Human Relations at work" offered to the CSM,CSE, ECE, EEE, IT branch in the IV year I Semester – Annexure-IV

3. The proposed syllabus for the course titled "Industrial Management and Startup Eco System" offered to the CSM,CSE, ECE, EEE, IT branch in the IV year I Semester – Annexure-V
4. The proposed syllabus for the course titled "Organizational Behavior" offered to the CSM,CSE, ECE, EEE, IT branch in the IV year I Semester – Annexure-VI

Item-3 : Approval of syllabus of B.Tech Program for Mandatory Courses

Resolution No: GVPCEW(A)/BOS/MANAGEMENT STUDIES-BS&H/2025/3

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Professional Ethics and Universal Human Values" offered to the CSM, ECE, EEE branch in the II year I Semester – Annexure-VII
2. The proposed syllabus for the course titled "Professional Ethics and Universal Human Values" offered to the CSE, IT branch in the II year I Semester – Annexure-VIII
3. The proposed syllabus for the course titled "Intellectual Property Rights and Patents" offered to the ECE, EEE branch in the III year I Semester – Annexure-IX
4. The proposed syllabus for the course titled "Intellectual Property Rights and Patents" offered to the CSE, CSM, IT branch in the III year II Semester – Annexure-X

Item-4: Approval of syllabus of 3rd Semester M.Tech Open Elective

Resolution No: GVPCEW(A)/BOS/MANAGEMENT STUDIES-BS&H/2025/4

It is resolved to recommend to the Academic Council that the following courses offered for M.Tech ECE (VLSI Design & Embedded Systems) & CSE (Data Science) Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Cost Management of Engineering Projects" offered to the ECE (VLSI Design & Embedded Systems) & CSE (Data Science) branches in the **3rd Semester**– Annexure-XI
2. The proposed syllabus for the course titled "Business Analytics" offered to the ECE (VLSI Design & Embedded Systems) & CSE (Data Science) branches in the **3rd Semester**– Annexure-XII

Resolution No: GVPCEW(A)/BOS/MANAGEMENT STUDIES-BS&H/2025/5

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr.K.L.Sai Prasad	Chairperson, BoS and Head, Dept of BS&H	
Ms. K.Vallisri KrishnaVeni	Assistant Professor	
Dr. R.Neelima	Assistant Professor	
Dr. V.Siva Jahnavy	Assistant Professor	
Dr. Rani Prava Nanda	Assistant Professor	
Dr.A.Narasimha Rao	Subject Expert	
Dr.P.Venkata Rao	Subject Expert	
Prof. P. Venkateswarlu	Vice Chancellor's Nominee	
Sri P. Rama Krishna	Industry Representative	
Ms.Tsapala Srujana	College Alumni	
Dr.K.V.V.Murali Someswararao	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM-530 048

Members Present:

Name of the Member	Designation	Signature
Dr.K.L.Sai Prasad	Chairperson, BoS and Head, Dept of BS&H	
Ms. K.Vallisri KrishnaVeni	Assistant Professor	
Dr. R.Neelima	Assistant Professor	
Dr. V.Siva Jahnavy	Assistant Professor	
Dr. Rani Prava Nanda	Assistant Professor	
Dr.A.Narasimha Rao	Subject Expert	
Dr.P.Venkata Rao	Subject Expert	
Prof. P. Venkateswarlu	Vice Chancellor's Nominee	
Sri P. Rama Krishna	Industry Representative	
Ms.Tsapala Srujana	College Alumni	
Dr.K.V.V.Murali Someswararao	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM-530 048

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF MATHEMATICS – BS&H

Minutes of 1st meeting of the Board of Studies in the Department of Mathematics -BS&H on 3rd August 2024(Saturday) at 1 PM.

The meeting of the Board of Studies in the Department of Mathematics – BS&H of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024(Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs offered by the Department of Mathematics under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr K L Sai Prasad - Chairperson

External Members:

1	Prof P A Lakshmi Narayana Professor, Dept of Mathematics IIT – Hyderabad	Subject Expert	Offline
2	Prof. K N S Kasi Viswanadham Professor, Dept of Mathematics NIT - Warangal	Subject Expert	Offline
3	Prof. Ch. Santhi Sundar Raj Dept of Engineering Mathematics AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Dr. A R J Srikanth Director Databrew Technologies Pvt Ltd	Industry Representative	Offline
5	Anitha Chiluvuri Senior Member of Technical Staff (SMTS) Oracle	College Alumni	Offline
6	Mr. Anil Kumar Paluri Assistant Vice President Bank of America	Expert for Special Courses	Offline.

Internal Members:

1	Prof. G. Sudheer	Professor, Vice Principal	offline
2	Dr. A. Suseelatha	Assistant Professor	offline
3	Ms. B. Bharathi	Assistant Professor	offline
4	Dr. A. Kameswara Rao	Assistant Professor	offline
5	Mr. SSVD Prakash Vepa	Assistant Professor	offline
6	Dr. T Poorna Kantha	Assistant Professor	offline
7	Ms. D S S S Ranjani	Assistant Professor	offline

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B.Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of Mathematics - BS&H started with a welcome note by the Chairperson wherein he presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Mathematics – BS&H for B.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/MATHEMATICS-BS&H/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Calculus and Differential Equations" offered to the CSE, CSE (AI-ML), IT, ECE, EEE branches in the I year I Semester - Annexure-1.
2. The proposed syllabus for the course titled "Linear Algebra and Vector Calculus" offered to the CSE, CSE (AI-ML), IT, ECE, EEE branches in the I year II Semester – Annexure-2.

Resolution No: GVPCEW(A)/BOS/MATHEMATICS-BS&H/2024/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr K L Sai Prasad	Chairperson, BoS and Head, Dept of BSH	
Prof. G. Sudheer	Professor, Vice Principal	
Dr. A. Suseelatha	Assistant Professor	
Ms. B. Bharathi	Assistant Professor	
Dr. A. Kameswara Rao	Assistant Professor	
Mr. SSVD Prakash Vepa	Assistant Professor	
Dr. T Poorna Kantha	Assistant Professor	
Ms. D S S S Ranjani	Assistant Professor	
Prof P A Lakshmi Narayana	Subject Expert	
Prof. K N S Kasi Viswanadham	Subject Expert	
Prof. Ch. Santhi Sundar Raj	Vice Chancellor's Nominee	
Dr. A R J Srikanth	Industry Representative	
Anitha Chiluvuri	College Alumni	
Mr. Anil Kumar Paluri	Expert for Special Courses	

Chairperson, BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING (A)
MADHURAWADA VISAKHAPATNAM

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
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Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF ENGLISH- BS& H

Minutes of 1st meeting of the Board of Studies in the Department of English- BS& H on 3rd August 2024, Saturday at 1 PM in hybrid mode.

The meeting of the Board of Studies in the Department of English- BS& H of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024,Saturday from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs offered by the Department of English- BS& H under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr.K L Sai Prasad - Chairperson

External Members:

1	Dr.G Survana Lakshmi Professor, Dept of ELT School of English Language Education, EFL University, Hyderabad	Subject Expert	G. Survana Lakshmi OFFLINE
2	Dr.Chandreie Mukherjee Assistant Professor IIM Visakhapatnam	Subject Expert	Chandreie Mukherjee OFFLINE
3	Dr. N Solomon Benny Dept of English, College of Arts &Commerce AU College of Engineering, Visakhapatnam	Vice Chancellor's Nominee	N.S. Benny OFFLINE
4	Ms. Shameem Bhanu Executive Business Administrator, The Quantum AI	Industry Representative	ONLINE
5	Ms. Sai Sindhura Kuppili Gudiewire Developer PWC	College Alumni	OFFLINE
6	Mr. Prasad Boya Director – Operations Quantum AI, Hi-tech City Hyderabad	Expert for Special Courses	ONLINE

Internal Members:

1	Dr.Ch.Alekya	Assistant Professor, English, Department of BS&H	OFFLINE
2	Dr.V.V.L.Usha Ramani	Assistant Professor, English, Department of BS&H	OFFLINE
3	Ms.B.Rama Devi	Assistant Professor, English, Department of BS&H	ABSENT

The meeting started with a welcome note by the Principal & Chairperson, Academic Council wherein the salient features of the regulations R-2024 were highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B.Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of English- BS& H started with a welcome note by the Chairperson. The subject coordinator presented an outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of English- BS& H for B.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech programs as requested by the Chairperson of the respective BoS of Department of Basic Science & Humanities- English . The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/BS&H/ENGLISH/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled 'English(Theory)'offered by the Department of English-BS&H to the Department of CSE & Department of IT in the I year I Semester –Annexure-I

2. The proposed syllabus for the course titled 'Communication Skills Lab' offered by the Department of English-BS&H to the Department of CSE & Department of IT in the I year I Semester –Annexure-II

3. The proposed syllabus for the course titled 'English(Theory)'offered by the Department of English-BS&H to the Department of ECE ,Department of EEE & Department of CSM in the I year II Semester –Annexure-III

4. The proposed syllabus for the course titled 'Communication Skills Lab' offered by the Department of English-BS&H to the Department of ECE ,Department of EEE & Department of CSM in the I year II Semester –Annexure-IV

Resolution No: GVPCEW(A)/BOS/BS&H/ENGLISH/2024/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr.K L Sai Prasad	Chairman, BoS &Head, Department of BS&H	
Dr.Ch.Alekya	Assistant Professor, English, Department of BS&H	
Dr.V.V.L.Usha Ramani	Assistant Professor, English, Department of BS&H	
Ms.B.Rama Devi	Assistant Professor, English, Department of BS&H	ABSENT
Dr.G Survana Lakshmi	Subject Expert	
Dr.Chandreie Mukherjee	Subject Expert	
Dr. N Solomon Benny	Vice Chancellor's Nominee	
Ms. Shameem Bhanu	Industry Representative	
Ms. Sai Sindhura Kuppili	College Alumni	
Mr. Prasad Boya	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
BASIC SCIENCES & HUMANITIES
GVP COLLEGE OF ENGINEERING FOR WOMEN
ADHURAWADA VISAKHAPATNAM-530 048

DEPARTMENT OF CHEMISTRY- BS & H

Minutes of 1st meeting of the Board of Studies in Chemistry, department of BS & H on 3rd August 2024 (Saturday) at 1 PM in hybrid mode.

The meeting of the Board of Studies in Chemistry-BS & H department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024 (Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B. Tech Programs offered by the Department of Chemistry-BS&H, under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr K L Saiprasad - Chairperson

External Members:

1	Subject Experts from outside the College	Dr.Someswara Rao S Associate Professor Department of Chemistry IIT-Tirupathi	(offline)
2	Subject Experts from outside the College	Dr.Suresh Babu Kalidindi Associate Professor Dept of Chemistry Central Tribal University of AP Vizianagaram	(offline)
3	Vice-Chancellor's Nomination	Prof. K Basavaiah Dept of Chemistry College of Science & Technology Andhra University Visakhapatnam	(offline)
4	Industry Representative	Ms. M Santhoshi Rupa Associate Manager Department of Manufacturing Compliance Pfizer Health Care India Pvt Ltd Lemarthy Village, Parawada Mandal Visakhapatnam	(offline)
5	College Alumni	Ms. Syed Suhana Amazon Web Services Bangalore	(offline)
6	Expert from outside the Autonomous College for Special Course	Mr.Akasapu Raviteja Senior Chemist Titanish Laboratories, Chadavaram Vizianagram	(offline)

Internal Members:

1	Dr Prava Rani Nanda	Assistant Professor, Member
2	Mr. S. Ashok	Assistant Professor, Member
3	Dr. P Srinivasa Rao	Assistant Professor, Member

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B. Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of Chemistry-BS & H started with a welcome note by the Chairperson wherein he presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Chemistry-BS & H for B.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/CHEMISTRY-BS&H/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Green Chemistry" offered to the CSE, IT & EEE branches in the I year I Semester – Annexure-1
2. The proposed syllabus for the course titled "Green Chemistry Lab" offered to the EEE branch in the I year I Semester – Annexure-I1
3. The proposed syllabus for the course titled "Green Chemistry" offered to the CSE (AIML) & ECE branches in the I year II Semester – Annexure-1II

Resolution No: GVPCEW(A)/BOS/CHEMISTR-BS&H/2024/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr K L Saiprasad	Chairperson, BoS and Head, Dept of BS & H	
Dr Prava Rani Nanda,	Assistant Professor	
Mr. S. Ashok	Assistant Professor	
Dr. P Srinivasa Rao	Assistant Professor	
Dr. Someswara Rao S	Subject Expert	
Dr. Suresh Babu Kalidindi	Subject Expert	
Prof. K Basavaiah	Vice Chancellor's Nominee	
Ms. M Santhoshi Rupa	Industry Representative	03/08/2024
Ms. Syed Suhana	College Alumni	
Mr.Akasapu Raviteja	Expert for Special Courses	03/08/24

Chairperson , BoS

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Minutes of 1st meeting of the Board of Studies in Computer Science and Engineering department on 3rd August 2024(Saturday) at 1 PM in hybrid mode

The meeting of the Board of Studies in Computer Science and Engineering department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024(Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs and first year (1st semester and 2nd semester) courses of M.Tech CSE (Data Science) Program offered by the Department of Computer Science and Engineering under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr P.V.S. Lakshmi Jagadamba - Chairperson

External Members:

1	Prof. Siba Kumar Udgata Professor School of Computer and Information Sciences University of Hyderabad Hyderabad	Subject Expert	Offline
2	Dr.Jyothi Vedurada Assistant Professor IIT-Hyderabad	Subject Expert	Online
3	Dr.R Padmavathy Professor, Dept of CSE NIT – Warangal	Subject Expert	Online
3	Prof.B Pragnya Dept. of Computer Science & Systems Engineering AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Dr.P.Gayatri Senior Technical Director / Scientist-F National Informatics Centre (NIC) Govt. of India	Industry Representative	Online
5	Ms. Sandeep Kaur Senior Software Developer Infinite Computer Solutions Visakhapatnam	College Alumni	Offline

6	Mr.Narra Suresh Delivery Centre Head Infosys Visakhapatnam	Expert for Special Courses	Offline

Internal Members:

1	Prof P. S. Avadhani	Senior Professor	Offline
2	Dr. N.B. Venkateswarlu	Professor	Offline
3	Dr. N. Sharmili	Associate Professor	Offline
4	Mrs. K. Suneetha	Assistant Professor	Offline
5	Mr. S. Sumahasan	Assistant Professor	Offline
6	Dr. A. Uday Kumar	Assistant Professor	Offline
7	Mrs. K. Rohini	Assistant Professor	Offline
8	Dr. V. Lakshmana Rao	Assistant Professor	Offline
9	Mr. G. Sankara Rao	Assistant Professor	Offline
10	Ms. Y. Sowmya	Assistant Professor	Offline
11	Ms. D. Indu	Assistant Professor	Offline
12	Mrs. V. Gowtami Annapurna	Assistant Professor	Offline
13	Mrs. KVS Mounica	Assistant Professor	Offline
14	Mrs. M Aswini	Assistant Professor	Offline
15	Ms A Bindu	Assistant Professor	Offline
16	Ms. R Archna	Assistant Professor	Offline
17	Ms. BVNS Lasya Priya	Assistant Professor	Offline

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B.Tech Programs and M.Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of Computer Science and Engineering started with a welcome note by the Chairperson wherein she presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Computer Science and Engineering for B.Tech Programs and M.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech, M.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/CSE/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs and M.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Python Programming" offered to the CSE branch in the I year II Semester – Annexure-I

2. The proposed syllabus for the course titled "Fundamentals of Computers" offered to the CSE branch in the I year I Semester – Annexure-II

3. The proposed syllabus for the course titled "Python Programming Lab" offered to the CSE branch in the I year II Semester – Annexure-III

4. The proposed syllabus for the course titled "Computer Engineering Workshop " offered to the CSE branch in the I year I Semester – Annexure-IV

5. The proposed syllabus for the course titled "Problem Solving using C" offered to the CSE branch along with ECE in the I year I Semester and EEE in I year II semester– Annexure-V

6. The proposed syllabus for the course titled "Web Technologies Fundamentals Lab" offered to the CSE branch in the I year II Semester – Annexure-VI

7. The proposed syllabus for the course titled "Problem Solving using C Lab" offered to the CSE branch along with ECE in the I year I Semester and EEE in I year II semester – Annexure-VII

8. The proposed syllabus for the course titled "IT Essentials" offered to the EEE branch in the I year I Semester – Annexure-VIII

Resolution No: GVPCEW(A)/BOS/CSE/2024/2

It is resolved to recommend to the Academic Council that the following courses offered for M.Tech CSE (Data Science) Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Introduction to Data Science" offered to the CSE branch in the I year I Semester – Annexure-IX

2. The proposed syllabus for the course titled "Cloud Computing and Virtualization" offered to the CSE branch in the I year I Semester – Annexure-X

3. The proposed syllabus for the course titled "Elective-I- Big Data Analytics" offered to the CSE branch in the I year I Semester – Annexure-XI

4. The proposed syllabus for the course titled "Elective-I- Computational Linear Algebra" offered to the CSE branch in the I year I Semester – Annexure-XII

5. The proposed syllabus for the course titled "Elective-I-Soft Computing" offered to the CSE branch in the I year I Semester – Annexure-XIII

6. The proposed syllabus for the course titled "Elective-I-Computational Biology" offered to the CSE branch in the I year I Semester – Annexure-XIV

7. The proposed syllabus for the course titled "Elective-I-Internet of Things" offered to the CSE branch in the I year I Semester – Annexure-XV

8. The proposed syllabus for the course titled "Elective-II- Cyber Security for Data Science" offered to the CSE branch in the I year I Semester – Annexure-XVI

9. The proposed syllabus for the course titled "Elective-II- Optimization Techniques for Data Science" offered to the CSE branch in the I year I Semester – Annexure-XVII

10. The proposed syllabus for the course titled "Elective-II- Time Series data Analysis" offered to the CSE branch in the I year I Semester – Annexure-XVIII

11. The proposed syllabus for the course titled "Elective-II- Natural Language Processing" offered to the CSE branch in the I year I Semester – Annexure-XIX

12. The proposed syllabus for the course titled "Elective-II- Statistical Modeling" offered to the CSE branch in the I year I Semester – Annexure-XX

13. The proposed syllabus for the course titled "Data Science Applications with Python Lab" offered to the CSE branch in the I year I Semester – Annexure-XXI

14. The proposed syllabus for the course titled "Cloud Computing and Big Data Analytics Lab" offered to the CSE branch in the I year I Semester – Annexure-XXII

15. The proposed syllabus for the course titled "Machine Learning" offered to the CSE branch in the I year II Semester – Annexure-XXIII

16. The proposed syllabus for the course titled "Data Visualization" offered to the CSE branch in the I year II Semester – Annexure-XXIV

17. The proposed syllabus for the course titled "Elective-III- Image and Video Analytics" offered to the CSE branch in the I year II Semester – Annexure-XXV

18. The proposed syllabus for the course titled "Elective-III- Social Media Analytics" offered to the CSE branch in the I year II Semester – Annexure-XXVI

19. The proposed syllabus for the course titled "Elective-III- Deep Learning" offered to the CSE branch in the I year II Semester – Annexure-XXVII

20. The proposed syllabus for the course titled "Elective-III- Business Analytics" offered to the CSE branch in the I year II Semester – Annexure-XXVIII

21. The proposed syllabus for the course titled "Elective-III- High Performance Computing" offered to the CSE branch in the I year II Semester – Annexure-XXIX

22. The proposed syllabus for the course titled "Elective-IV- Geographic Information System" offered to the CSE branch in the I year II Semester – Annexure-XXX

23. The proposed syllabus for the course titled "Elective-IV- Block Chain Technology" offered to the CSE branch in the I year II Semester – Annexure-XXXI

24. The proposed syllabus for the course titled "Elective-IV- Secure Software Design" offered to the CSE branch in the I year II Semester – Annexure-XXXII

25. The proposed syllabus for the course titled "Elective-IV- Data Storage Technologies and Networks" offered to the CSE branch in the I year II Semester – Annexure-XXXIII

26. The proposed syllabus for the course titled "Elective-IV- Information Retrieval Systems" offered to the CSE branch in the I year II Semester – Annexure-XXXIV

27. The proposed syllabus for the course titled "Machine Learning Lab" offered to the CSE branch in the I year II Semester – Annexure-XXXV

28. The proposed syllabus for the course titled "Data Visualization using Tableau Lab" offered to the CSE branch in the I year II Semester – Annexure-XXXVI

Resolution No: GVPCEW(A)/BOS/CSE/2024/3

The Board Members unanimously authorize the Chairman to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr.P.V.S.L.Jagadamba	Chairperson, BoS and Head, Dept of CSE	
Prof P. S. Avadhani	Senior Professor	
Dr. N.B. Venkateswarlu	Professor	
Dr. N. Sharmili	Associate Professor	
Mrs. K. Suneetha	Assistant Professor	
Mr. S. Sumahasan	Assistant Professor	
Dr. A. Uday Kumar	Assistant Professor	
Mrs. K. Rohini	Assistant Professor	
Dr. V. Lakshmana Rao	Assistant Professor	
Mr. G. Sankara Rao	Assistant Professor	
Ms. Y. Sowmya	Assistant Professor	
Ms. D. Indu	Assistant Professor	
Mrs. V. Gowtami Annapurna	Assistant Professor	
Mrs. KVS Mounica	Assistant Professor	
Mrs. M Aswini	Assistant Professor	
Ms A Bindu	Assistant Professor	
Ms. R Archna	Assistant Professor	
Ms. BVNS Lasya Priya	Assistant Professor	
Prof. Siba Kumar Udgata	Subject Expert	
Dr.Jyothi Vedurada	Subject Expert	
Dr.R Padmavathy	Subject Expert	
Prof.B Pragnya	Vice Chancellor's Nominee	
Dr.P.Gayatri	Industry Representative	
Ms. Sandeep Kaur	College Alumni	
Mr.Narra Suresh	Expert for Special Courses	

Chairperson, BoS

The meeting concluded by thanking all the members.

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Ms. R Archna	Assistant Professor	
Ms. BVNS Lasya Priya	Assistant Professor	
Prof. Siba Kumar Udgata	Subject Expert	
Dr.Jyothi Vedurada	Subject Expert	V. Jyoti
Dr.R Padmavathy	Subject Expert	
Prof.B Pragnya	Vice Chancellor's Nominee	
Dr.P.Gayatri	Industry Representative	
Ms. Sandeep Kaur	College Alumni	
Mr.Narra Suresh	Expert for Special Courses	

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Chairperson , BoS

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Chairperson , BoS

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Minutes of 2nd meeting of the Board of Studies in Computer Science and Engineering department held on 28th and 29th March 2025 (Friday & Saturday) from 10:00 AM to 04:00 PM in hybrid mode.

The meeting of the Board of Studies in Computer Science and Engineering Department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 28th and 29th March 2025 (Friday & Saturday) from 10:00 AM to 04:00 PM to finalize the syllabi of the of the 2nd, 3rd & 4th year (1st semester and 2nd semester) courses of all B.Tech Programs and 2nd year (1st semester and 2nd semester) courses of M.Tech CSE (Data Science) programs offered by the Department of Computer Science and Engineering under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:
Dr P.V.S. Lakshmi Jagadamba - Chairperson

External Members:

1	Prof. Siba Kumar Udgata Professor School of Computer and Information Sciences University of Hyderabad Hyderabad	Subject Expert	Online
2	Dr. Jyothi Vedurada Assistant Professor IIT-Hyderabad	Subject Expert	Online
3	Prof. R Padmavathy Professor, Dept of CSE NIT – Warangal	Subject Expert	Online
3	Prof. B Prajna Dept. of Computer Science & Systems Engineering AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Dr.P.Gayatri Senior Technical Director / Scientist-F National Informatics Centre (NIC) Govt. of India	Industry Representative	Online
5	Ms. Sandeep Kaur Senior Software Developer Infinite Computer Solutions Visakhapatnam	College Alumni	Offline
6	Mr.Narra Suresh Delivery Centre Head Infosys Visakhapatnam	Expert for Special Courses	Offline

Head of Department
Dept. of Computer Science & Engineering
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48

Internal Members:

1	Prof P. S. Avadhani	Senior Professor	Offline
2	Dr. N. Sharmili	Professor	Offline
3	Dr. V. Lakshmana Rao	Associate Professor	Offline
4	Mrs. K. Suneetha	Assistant Professor	Offline
5	Dr. S. Sumahasan	Assistant Professor	Offline
6	Dr. K. Rohini	Assistant Professor	Offline
7	Dr. G. Sankara Rao	Assistant Professor	Offline
8	Ms. Y. Sowmya	Assistant Professor	Offline
9	Ms. D. Indu	Assistant Professor	Offline
10	Mrs. V. Gowtami Annapurna	Assistant Professor	Offline
11	Mrs. KVS Mounica	Assistant Professor	Offline
12	Mrs. M Aswini	Assistant Professor	Offline
13	Ms. R Archna	Assistant Professor	Offline
14	Ms. B.V.N.S Lasya Priya	Assistant Professor	Offline
15	Dr. P Muralidhar Rao	Assistant Professor	Offline
16	Ms. K.A.V Lakshmi Prasanna	Assistant Professor	Offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B.Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B.Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B.Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B.Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of Computer Science and Engineering commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, 3rd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech and M.Tech programs under R-24 regulations, the Board collectively agreed to implement the proposed courses across various B.Tech and M.Tech programs.

Head of Department
Dept. of Computer Science & Engineering
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48

The Board unanimously resolved the following:

Item-1 : B.Tech CSE Course Structure

Resolution No: GVPCEW(A)/BOS-2/CSE/2025/1

It has been resolved to recommend to the Academic Council for approval of the Course Structure, as outlined in Annexure-I, be implemented for the B.Tech CSE Program, effective from the 2024 admitted batch onwards.

Item-2 : Approval of syllabus of II, III & IV B.Tech CSE Program

Resolution No: GVPCEW(A)/BOS-2/CSE/2025/2

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech CSE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Computer Organization" offered to the CSE branch in the II year I Semester – Annexure-II
2. The proposed syllabus for the course titled "Data Structures" offered to the CSE branch in the II year I Semester – Annexure-III
3. The proposed syllabus for the course titled "Object Oriented Programming Through Java" offered to the CSE branch in the II year I Semester – Annexure-IV
4. The proposed syllabus for the course titled "Operating Systems" offered to the CSE branch in the II year I Semester – Annexure-V
5. The proposed syllabus for the course titled "Data Structures Lab" offered to the CSE branch in the II year I Semester – Annexure-VI
6. The proposed syllabus for the course titled "Object Oriented Programming Through Java Lab" offered to the CSE branch in the II year I Semester – Annexure-VII
7. The proposed syllabus for the course titled "Operating Systems Lab" offered to the CSE branch in the II year I Semester – Annexure-VIII
8. The proposed syllabus for the course titled "Skill Course-1: Advanced Python Programming" offered to the CSE branch in the II year I Semester – Annexure-IX
9. The proposed syllabus for the course titled "Design and Analysis of Algorithms" offered to the CSE branch in the II year II Semester – Annexure-X
10. The proposed syllabus for the course titled "Database Management Systems" offered to the CSE branch in the II year II Semester – Annexure-XI
11. The proposed syllabus for the course titled "Formal Languages and Automata Theory" offered to the CSE branch in the II year II Semester – Annexure-XII
12. The proposed syllabus for the course titled "Algorithms Lab Through C++" offered to the CSE branch in the II year II Semester – Annexure-XIII

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13. The proposed syllabus for the course titled "Database Management Systems Lab" offered to the CSE branch in the II year II Semester – Annexure-XIV
14. The proposed syllabus for the course titled "Skill Course II: MERN Stack Development" offered to the CSE branch in the II year II Semester – Annexure-XV
15. The proposed syllabus for the course titled "Computer Networks" offered to the CSE branch in the III year I Semester – Annexure-XVI
16. The proposed syllabus for the course titled "Data Warehousing and Data Mining" offered to the CSE branch in the III year I Semester – Annexure-XVII
17. The proposed syllabus for the course titled "Compiler Design" offered to the CSE branch in the III year I Semester – Annexure-XVIII
18. The proposed syllabus for the course titled "Computer Networks Lab" offered to the CSE branch in the III year I Semester – Annexure-XIX
19. The proposed syllabus for the course titled "Data Mining Lab" offered to the CSE branch in the III year I Semester – Annexure-XX
20. The proposed syllabus for the course titled "Skill Course III: Continuous Integration and Continuous Delivery Using DevOps" offered to the CSE branch in the III year I Semester – Annexure-XXI
21. The proposed syllabus for the course titled "Design Thinking, Innovations & Entrepreneurship" as mandatory course offered to the CSE branch in the III year I Semester – Annexure-XXII
22. The proposed syllabus for the course titled "Machine Learning" offered to the CSE branch in the III year II Semester – Annexure-XXIII
23. The proposed syllabus for the course titled "Cryptography and Network Security" offered to the CSE branch in the III year II Semester – Annexure-XXIV
24. The proposed syllabus for the course titled "Object Oriented Software Engineering" offered to the CSE branch in the III year II Semester – Annexure-XXV
25. The proposed syllabus for the course titled "Machine Learning Lab" offered to the CSE branch in the III year II Semester – Annexure-XXVI
26. The proposed syllabus for the course titled "Cryptography and Network Security Lab" offered to the CSE branch in the III year II Semester – Annexure-XXVII
27. The proposed syllabus for the course titled "Object Oriented Software Engineering Lab" offered to the CSE branch in the III year II Semester – Annexure-XXVIII
28. The proposed syllabus for the course titled "Skill Course V: Big Data Analytics with PySpark" offered to the CSE branch in the IV year I Semester – Annexure-XXIX
29. The proposed syllabus for the course titled "Skill Course V: Deep Learning Essentials With Python" offered to the CSE branch in the IV year I Semester – Annexure-XXX

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Item-3 : Approval of syllabus of Professional Elective courses

Resolution No: GVPCEW(A)/BOS-2/CSE/2025/3

It is resolved to recommend to the Academic Council that the following Program Elective courses offered for B.Tech CSE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "API and Micro Services" offered to the CSE branch as Professional Elective – Annexure-XXXI
2. The proposed syllabus for the course titled "Artificial Intelligence Techniques" offered to the CSE branch as Professional Elective – Annexure-XXXII
3. The proposed syllabus for the course titled "Block Chain Technologies" offered to the CSE branch as Professional Elective – Annexure-XXXIII
4. The proposed syllabus for the course titled "Computer Vision" offered to the CSE branch as Professional Elective – Annexure-XXXIV
5. The proposed syllabus for the course titled "Cybersecurity and Digital Forensics" offered to the CSE branch as Professional Elective – Annexure-XXXV
6. The proposed syllabus for the course titled "Deep Learning" offered to the CSE branch as Professional Elective – Annexure-XXXVI
7. The proposed syllabus for the course titled "Distributed Systems" offered to the CSE branch as Professional Elective – Annexure-XXXVII
8. The proposed syllabus for the course titled "Ethical Hacking" offered to the CSE branch as Professional Elective – Annexure-XXXVIII
9. The proposed syllabus for the course titled "Fog and Edge Computing" offered to the CSE branch as Professional Elective – Annexure-XXXIX
10. The proposed syllabus for the course titled "Generative AI Models" offered to the CSE branch as Professional Elective – Annexure-XL
11. The proposed syllabus for the course titled "Hadoop and Big Data Analytics" offered to the CSE branch as Professional Elective – Annexure-XLI
12. The proposed syllabus for the course titled "Human Computer Interaction" offered to the CSE branch as Professional Elective – Annexure-XLII
13. The proposed syllabus for the course titled "Java Spring Framework" offered to the CSE branch as Professional Elective – Annexure-XLIII
14. The proposed syllabus for the course titled "Mobile Application Development" offered to the CSE branch as Professional Elective – Annexure-XLIV
15. The proposed syllabus for the course titled "NoSQL Databases" offered to the CSE branch as Professional Elective – Annexure-XLV

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16. The proposed syllabus for the course titled "Soft Computing" offered to the CSE branch as Professional Elective – Annexure-XLVI

Item-4 : Approval of syllabus of Open Elective courses & Other department courses offered by CSE

Resolution No: GVPCEW(A)/BOS-2/CSE/2025/4

It is resolved to recommend to the Academic Council that the following Open Elective courses and other department courses offered by CSE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Introduction to Artificial Intelligence" offered by CSE branch as Open Elective to other branches – Annexure-XLVII
2. The proposed syllabus for the course titled "Human Machine Interaction" offered by CSE branch as Open Elective to other branches – Annexure-XLVIII
3. The proposed syllabus for the course titled "Software Project Management" offered by CSE branch as Open Elective to other branches – Annexure-XLIX
4. The proposed syllabus for the course titled "Skill Course: Data Structures using Python" offered to the EEE branch in III year II Semester as skill course Annexure-L

Item-5 : Approval of the subjects & syllabus related to Minor program in CSE

Resolution No: GVPCEW(A)/BOS-2/CSE/2025/5

It is resolved to recommend to the Academic Council that the following courses offered for Minor Program in CSE to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Introduction to Web Technologies" offered to the CSE branch as Minor Course – Annexure-LI
2. The proposed syllabus for the course titled "Introduction to Database Management System" offered to the CSE branch as Minor Course – Annexure-LII.
3. The proposed syllabus for the course titled "Principles Of Operating Systems" offered to the CSE branch as Minor Course – Annexure-LIII.
4. The proposed syllabus for the course titled "Software Engineering" offered to the CSE branch as Minor Course – Annexure-LIV

Item-6 : Approval of the subjects & syllabus related to Honors program in CSE

Resolution No: GVPCEW(A)/BOS-2/CSE/2025/6

It is resolved to recommend to the Academic Council that the following courses offered for Honors Program in CSE to be effective from 2024 admitted batch onwards for approval.

Head of Department
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1. The proposed syllabus for the course titled "High Performance Computing" offered to the CSE branch as Honors Course – Annexure-LV
2. The proposed syllabus for the course titled "Fundamentals of Reinforcement Learning" offered to the CSE branch as Honors Course – Annexure-LVI
3. The proposed syllabus for the course titled "Quantum Computing" offered to the CSE branch as Honors Course – Annexure-LVII
4. The proposed syllabus for the course titled "Social Media Analytics" offered to the CSE branch as Honors Course – Annexure-LVIII
5. The proposed syllabus for the course titled "Software Metrics" offered to the CSE branch as Honors Course – Annexure-LIX

Item-7: Approval of Course Structure & syllabus of II M.Tech

Resolution No: GVPCEW(A)/BOS/CSE/2025/7

It is resolved to recommend to the Academic Council that the following courses offered for II year M.Tech CSE (Data Science) Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Elective-V-Digital Forensics" offered to the CSE branch in the II year I Semester – Annexure-LX
2. The proposed syllabus for the course titled "Elective-V-Enterprise Cloud Computing" offered to the CSE branch in the II year I Semester – Annexure-LXI
3. The proposed syllabus for the course titled "Elective-V-Parallel Computing" offered to the CSE branch in the II year I Semester – Annexure-LXII
4. The proposed syllabus for the course titled "Elective-V-Data Science in Finance" offered to the CSE branch in the II year I Semester – Annexure-LXIII
5. The proposed syllabus for the course titled "Elective-V-Data Science for Health Care" offered to the CSE branch in the II year I Semester – Annexure-LXIV

Resolution No: GVPCEW(A)/BOS/CSE/2025/8

The Board Members unanimously authorize the Chairman to make minor modifications in the title/content of a course if necessary.

The meeting is concluded by thanking all the BoS members present in online or offline mode.

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Members Present:

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Dr. R Padmavathy	Subject Expert	
Prof. B Prajnya	Vice Chancellor's Nominee	
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Mr. Narra Suresh	Expert for Special Courses	

Chairperson, BoS

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Chairperson , BoS

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Dr. P Muralidhar	Assistant Professor	
Ms. K.A.V Lakshmi Prasanna	Assistant Professor	
Prof. Siba Kumar Udgata	Subject Expert	
Dr. Jyothi Vedurada	Subject Expert	
Dr. R Padmavathy	Subject Expert	
Prof. B Prajnya	Vice Chancellor's Nominee	
Dr. P.Gayatri	Industry Representative	Gayatri 2/4/25.
Ms. Sandeep Kaur	College Alumni	
Mr. Narra Suresh	Expert for Special Courses	

Chairperson , BoS

Members Present:

Name of the Member	Designation	Signature
Dr.P.V.S.L.Jagadamba	Chairperson, BoS and Head, Dept of CSE	
Prof P. S. Avadhani	Senior Professor	
Dr. N. Sharmili	Professor	
Dr. V. Lakshmana Rao	Associate Professor	
Mrs. K. Suneetha	Assistant Professor	
Dr. S. Sumahasan	Assistant Professor	
Dr. K. Rohini	Assistant Professor	
Dr. G. Sankara Rao	Assistant Professor	
Ms. Y. Sowmya	Assistant Professor	
Ms. D. Indu	Assistant Professor	
Mrs. V. Gowtami Annapurna	Assistant Professor	
Mrs. KVS Mounica	Assistant Professor	
Mrs. M Aswini	Assistant Professor	
Ms. R Archna	Assistant Professor	
Ms. BVNS Lasya Priya	Assistant Professor	
Dr. P Muralidhar	Assistant Professor	
Ms. K.A.V Lakshmi Prasanna	Assistant Professor	
Prof. Siba Kumar Udgata	Subject Expert	
Dr. Jyothi Vedurada	Subject Expert	
Prof. R Padmavathy	Subject Expert	
Prof. B Prajnya	Vice Chancellor's Nominee	
Dr. P.Gayatri	Industry Representative	
Ms. Sandeep Kaur	College Alumni	Sandeep Kaur
Mr. Narra Suresh	Expert for Special Courses	

Chairperson , BoS

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Minutes of 1st meeting of the Board of Studies in Electronics and Communication Engineering department on 3rd August 2024(Saturday) at 1 PM in hybrid mode

The meeting of the Board of Studies in Electronics and Communication Engineering department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024(Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs and first year((1st semester and 2nd semester) courses of M.Tech programs offered by the Department of Electronics and Communication Engineering under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr P.M.K.Prasad - Chairperson

External Members:

1	Prof. Tapan Kumar Gandhi Professor, Department of Electrical Engineering Indian Institute of Technology, Delhi	Subject Expert	Online
2	Prof.Venkata Mani V. Professor Dept.of ECE, National Institute of Technology, Warangal	Subject Expert	Offline
3	Prof.P.Rajesh Kumar Professor Dept.of Electronics and Communication Engineering AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Sri A.Venkata Krishna CEO , Ascentsemi R & D Pvt.Ltd Bengaluru	Industry Representative	Offline
5	Ms.Krishna Deepika Chittela Staff Engineer Synoposys, Bengaluru	College Alumni	Online
6	Sri Amal Raj Pukkella Founder, Digifac Services Pvt.Ltd & COO, Headfitted Pvt Ltd Visakhapatnam	Expert for Special Courses	Offline

Internal Members:

1	Dr.L.Ganesh	Associate Professor	Offline
2	Dr.B.Vijayalakshmi	Associate Professor	Offline

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ELECTRONICS AND COMMUNICATION ENGINEERING

3	Dr.D.V.A.N.Ravikumar	Associate Professor	Offline
4	Ms.B.V.S.Renuka Devi	Assistant Professor	On leave
5	Ms.Ch.Sirisha	Assistant Professor	Offline
6	Dr.M.Manikumari	Assistant Professor	Offline
7	Mr.N.V.Maheswara Rao	Assistant Professor	Offline
8	Ms.B.Lakshmi	Assistant Professor	Offline
9	Ms.L.Sarika	Assistant Professor	Offline
10	Mr.R.Sunil Kumar	Assistant Professor	Offline
11	Mr.PVK Chaitanya	Assistant Professor	Offline
12	Ms.N.Roopavathi	Assistant Professor	Offline
13	Ms.B.Divyasathi	Assistant Professor	Offline
14	Dr.P.V.Dileep Bhumireddi	Assistant Professor	Offline
15	Ms.R.Jalaja	Assistant Professor	Maternity leave
16	Ms.M.Hemlata	Assistant Professor	On Leave
17	Ms.BVR Gowri	Assistant Professor	Offline
18	Ms.K.Aishawrya	Assistant Professor	On leave

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B.Tech Programs and M.Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of Electronics and Communication Engineering started with a welcome note by the Chairperson wherein she presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Electronics and Communication Engineering for B.Tech and M.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech,M.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/ECE/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Electronic Devices and Circuits " offered to the ECE branch in the I year I Semester – Annexure-I

2. The proposed syllabus for the course titled "Electronic Devices and Circuits Lab " offered to the ECE branch in the I year I Semester – Annexure-II

3. The proposed syllabus for the course titled "Basic Electronics Engineering " offered to the EEE branch in the I year I semester – Annexure-III

4. The proposed syllabus for the course titled "Elements of Electronics Engineering " offered to the CSM,CSE,IT branch in the I year I semester/II Semester-Annexure-IV

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5. The proposed syllabus for the course titled "Digital Logic Design " offered to the ECE branch in the I year II Semester – Annexure-V

6. The proposed syllabus for the course titled "Electronic Circuit Analysis " offered to the ECE branch in the I year II Semester – Annexure-VI

7. The proposed syllabus for the course titled "Digital Logic Design lab " offered to the ECE branch in the I year II Semester – Annexure-VII

8. The proposed syllabus for the course titled "Electronic Circuit Analysis lab " offered to the ECE branch in the I year II Semester – Annexure-VIII

Resolution No: GVPCEW(A)/BOS/ECE/2024/2

It is resolved to recommend to the Academic Council that the following courses offered for M.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Analog and Digital CMOS VLSI Design" offered to the ECE branch in the I year I Semester – Annexure-IX

2. The proposed syllabus for the course titled "Embedded systems Design " offered to the ECE branch in the I year I Semester – Annexure-X

3. The proposed syllabus for the course titled "Application Specific Integrated Circuit(ASIC) " offered to the ECE branch in the I year I Semester – Annexure-XI

4. The proposed syllabus for the course titled "Advanced Operating Systems" offered to the ECE branch in the I year I Semester – Annexure-XII

5. The proposed syllabus for the course titled "Parallel Processing" offered to the ECE branch in the I year I Semester – Annexure-XIII

6. The proposed syllabus for the course titled "CPLD and FPGA Architectures & Applications" offered to the ECE branch in the I year I Semester – Annexure-XIV

7. The proposed syllabus for the course titled "Electronic Design Automation Tools " offered to the ECE branch in the I year I Semester – Annexure-XV

8. The proposed syllabus for the course titled "Digital System Design " offered to the ECE branch in the I year I Semester – Annexure-XVI

9. The proposed syllabus for the course titled "Analog and Digital CMOS VLSI Design Lab " offered to the ECE branch in the I year I Semester – Annexure-XVII

10. The proposed syllabus for the course titled "Embedded systems Design Lab " offered to the ECE branch in the I year I Semester – Annexure-XVIII

11. The proposed syllabus for the course titled "RTL Design & Verification using System Verilog" offered to the ECE branch in the I year II Semester – Annexure-XIX

12. The proposed syllabus for the course titled "Internet of Things and its applications " offered to the ECE branch in the I year II Semester – Annexure-XX

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13. The proposed syllabus for the course titled "Low power VLSI Design " offered to the ECE branch in the I year II Semester – Annexure-XXI

14. The proposed syllabus for the course titled "System on Chip Design " offered to the ECE branch in the I year II Semester – Annexure-XXII

15. The proposed syllabus for the course titled "Digital signal and Image Processing " offered to the ECE branch in the I year II Semester – Annexure-XXIII

16. The proposed syllabus for the course titled "Communication Buses and Interfaces "offered to the ECE branch in the I year II Semester – Annexure-XXIV

17. The proposed syllabus for the course titled "Design for Testability "offered to the ECE branch in the I year II Semester – Annexure-XXV.

18. The proposed syllabus for the course titled "DSP Processors and Architectures "offered to the ECE branch in the I year II Semester – Annexure-XXVI

19.The proposed syllabus for the course titled "RTL Design & Verification using System Verilog lab " offered to the ECE branch in the I year II Semester – Annexure-XXVII.

20. The proposed syllabus for the course titled "Internet of Things and its applications lab offered to the ECE branch in the I year II Semester – Annexure-XXVIII

21. The proposed syllabus for the course titled "Mini project with seminar " offered to the ECE branch in the I year II Semester – Annexure-XXIX

Resolution No: GVPCEW(A)/BOS/ECE/2024/3

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr.P.M.K.Prasad	Chairperson, BoS and Head, Dept of ECE	
Dr.L.Ganesh	Associate Professor	
Dr.B.Vijayalakshmi	Associate Professor	
Dr.D.V.A.N.Ravikumar	Associate Professor	
Ms.Ch.Sirisha	Assistant Professor	
Dr.M.Manikumari	Assistant Professor	
Mr.N.V.Maheswara Rao	Assistant Professor	
Ms.B.Lakshmi	Assistant Professor	
Ms.L.Sarika	Assistant Professor	
Mr.R.Sunil Kumar	Assistant Professor	
Mr.PVK Chaitanya	Assistant Professor	
Ms.N.Roopavathi	Assistant Professor	
Ms.B.Divyasathi	Assistant Professor	
Dr.P.V.Dileep Bhumireddi	Assistant Professor	

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

Ms.B.V.R.Gowri	Assistant Professor	
Dr. Tapan Kumar Gandhi	Subject Expert	
Prof.Venkata Mani V.	Subject Expert	
Prof.P.Rajesh Kumar	Vice Chancellor's Nominee	
Sri A.Venkata Krishna	Industry Representative	
Ms.Krishna Deepika Chittela	College Alumni	
Sri Amal Raj Pukkella	Expert for Special Courses	

Chairperson, BoS

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Ms.B.V.R.Gowri	Assistant Professor	
Prof.Tapan Kumar Gandhi	Subject Expert	
Prof.Venkata Mani V.	Subject Expert	
Prof.P.Rajesh Kumar	Vice Chancellor's Nominee	
Sri A.Venkata Krishna	Industry Representative	
Ms.Krishna Deepika Chittela	College Alumni	
Sri Amal Raj Pukkella	Expert for Special Courses	

Chairperson , BoS

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GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)
(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Minutes of the 2nd meeting of the Board of Studies in Electronics and Communication Engineering Department held on 10th & 11th April 2025(Thursday & Friday) from 10:00AM to 04:00PM in hybrid mode

The meeting of the Board of Studies in Electronics and Communication Engineering Department of Gayatri Vidya Parishad College of Engineering for Women is held on 10th & 11th April 2025 (Thursday & Friday) from 10:00AM to 04:00PM to finalize the course structure and syllabi of the 2nd , 3rd & 4th year (1st semester and 2nd semester) courses of all B.Tech Programs and 2nd year((1st semester and 2nd semester) courses of M.Tech programs offered by the Department of Electronics and Communication Engineering under the regulations R – 24 from the academic year 2024-25 onwards.

Members Present:

Dr P.M.K.Prasad - Chairperson

External Members:

1	Prof. Tapan Kumar Gandhi Professor, Department of Electrical Engineering Indian Institute of Technology, Delhi	Subject Expert	Online
2	Prof. Venkata Mani V. Professor Dept. of ECE, National Institute of Technology, Warangal	Subject Expert	Offline
3	Prof. P. Rajesh Kumar Professor Dept. of Electronics and Communication Engineering AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Sri A. Venkata Krishna CEO , Ascentsemi R & D Pvt.Ltd Bengaluru	Industry Representative	Offline
5	Ms.Krishna Deepika Chittela Staff Engineer Synoposys, Bengaluru	College Alumni	Offline
6	Sri Amal Raj Pukkella Founder, Digifac Services Pvt.Ltd & COO, Headfitted Pvt Ltd Visakhapatnam	Expert for Special Courses	Offline

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ELECTRONICS AND COMMUNICATION ENGINEERING
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MADHURAWADA, VISAKHAPATNAM – 530 048

Internal Members:

1	Dr.L.Ganesh	Associate Professor	Offline
2	Dr.B.Vijayalakshmi	Associate Professor	Offline
3	Dr.D.V.A.N.Ravikumar	Associate Professor	Offline
4	Ms.B.V.S.Renuka Devi	Assistant Professor	Offline
5	Ms.Ch.Sirisha	Assistant Professor	Offline
6	Dr.M.Manikumari	Assistant Professor	Offline
7	Mr.N.V.Maheswara Rao	Assistant Professor	Offline
8	Ms.B.Lakshmi	Assistant Professor	Offline
9	Ms.L.Sarika	Assistant Professor	Offline
10	Mr.R.Sunil Kumar	Assistant Professor	Offline
11	Mr.PVK Chaitanya	Assistant Professor	Offline
12	Ms.N.Roopavathi	Assistant Professor	Offline
13	Ms.B.Divyasathi	Assistant Professor	Offline
14	Dr.P.V.Dileep Bhumireddi	Assistant Professor	Offline
15	Ms.R.Jalaja	Assistant Professor	Offline
16	Ms.M.Hemlata	Assistant Professor	On Leave
17	Ms.BVR Gowri	Assistant Professor	Offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B.Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B.Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B.Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B.Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of Electronics and Communication Engineering commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, 3rd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech and M.Tech programs under R-24 regulations, the Board collectively agreed to implement the proposed courses across various B.Tech and M.Tech programs.

The Board unanimously resolved the following:

Item-1 : B.Tech ECE Course Structure

Resolution No: GVPCEW(A)/BOS-2/ECE/2025/1

It has been resolved to recommend to the Academic Council for approval, the course structure of 2nd, 3rd & 4th year B. Tech Program as outlined in Annexure-I. The courses are to be offered for B.Tech ECE program from the 2024 admitted batch onwards.

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Item-2 : Approval of the syllabus of II, III & IV B.Tech ECE Program

Resolution No: GVPCEW(A)/BOS-2/ECE/2025/2

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech ECE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Linear ICs & Applications" offered to the ECE branch in the II year I Semester – Annexure-II
2. The proposed syllabus for the course titled "Pulse and Digital Circuits" offered to the ECE branch in the II year I Semester – Annexure-III
3. The proposed syllabus for the course titled "Signals & Systems" offered to the ECE branch in the II year I Semester – Annexure-IV
4. The proposed syllabus for the course titled "Linear ICs & Pulse Circuits Lab" offered to the ECE branch in the II year I Semester – Annexure-V
5. The proposed syllabus for the course titled "Signals & Systems lab" offered to the ECE branch in the II year I Semester – Annexure-VI
6. The proposed syllabus for the course titled "Python Programming" offered to the ECE branch in the II year I Semester – Annexure-VII
7. The proposed syllabus for the course titled "Probability Theory and Random Process" offered to the ECE branch in the II year II Semester – Annexure-VIII
8. The proposed syllabus for the course titled "Digital System Design" offered to the ECE branch in the II year II Semester – Annexure-IX
9. The proposed syllabus for the course titled "Electromagnetic Field Theory and Transmission Lines" offered to the ECE branch in the II year II Semester – Annexure-X
10. The proposed syllabus for the course titled "Microprocessors and Microcontrollers" offered to the ECE branch in the II year II Semester – Annexure-XI
11. The proposed syllabus for the course titled "Digital System Design Lab" offered to the ECE branch in the II year II Semester – Annexure-XII
12. The proposed syllabus for the course titled "Microprocessors and Microcontrollers Lab" offered to the ECE branch in the II year II Semester – Annexure-XIII
13. The proposed syllabus for the course titled "Analog Communications" offered to the ECE branch in the III year I Semester – Annexure-XIV
14. The proposed syllabus for the course titled "Antennas and Wave Propagation" offered to the ECE branch in the III year I Semester – Annexure-XV
15. The proposed syllabus for the course titled "VLSI Design" offered to the ECE branch in the III year I Semester – Annexure-XVI
16. The proposed syllabus for the course titled "Analog Communication lab" offered to the ECE branch in the III year I Semester – Annexure-XVII
17. The proposed syllabus for the course titled "VLSI Lab" offered to the ECE branch in the III year I Semester – Annexure-XVIII
18. The proposed syllabus for the course titled "Digital Communications" offered to the ECE branch in the III year II Semester – Annexure-XIX
19. The proposed syllabus for the course titled "Digital Signal Processing" offered to the ECE branch in the III year II Semester – Annexure-XX
20. The proposed syllabus for the course titled "Microwave Engineering" offered to the ECE branch in the III year II Semester – Annexure-XXI
21. The proposed syllabus for the course titled "Digital Communication Lab" offered to the ECE branch in the III year II Semester – Annexure-XXII
22. The proposed syllabus for the course titled "Digital Signal Processing Lab" offered to the ECE branch in the III year II Semester – Annexure-XXIII
23. The proposed syllabus for the course titled "Antennas and Microwave Engineering Lab" offered to the ECE branch in the III year II Semester – Annexure-XXIV

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24. The proposed syllabus for the course titled "IoT applications" offered to the ECE, CSE(AI&ML) & CSE branch in the III year II/ I Semester – Annexure-XXV
25. The proposed syllabus for the course titled "Design Thinking, Innovation and Entrepreneurship" offered to the ECE branch in the III year II Semester – Annexure-XXVI

Item-3 : Approval of the syllabus of Professional Elective courses

Resolution No: GVPCEW(A)/BOS-2/ECE/2024/3

It is resolved to recommend to the Academic Council that the following Program Elective courses offered for B.Tech ECE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Advanced Microprocessors" offered to the ECE branch as Program Elective Course – Annexure-XXVII
2. The proposed syllabus for the course titled "Analog and Digital IC Design" offered to the ECE branch as Program Elective Course – Annexure-XXVIII
3. The proposed syllabus for the course titled "Cellular Mobile Communication" offered to the ECE branch as Program Elective Course – Annexure-XXIX
4. The proposed syllabus for the course titled "Computer Architecture & Organization" offered to the ECE branch as Program Elective Course – Annexure-XXX
5. The proposed syllabus for the course titled "Data Networks" offered to the ECE branch as Program Elective Course – Annexure- XXXI
6. The proposed syllabus for the course titled "Digital Image Processing" offered to the ECE branch as Program Elective Course – Annexure- XXXII
7. The proposed syllabus for the course titled "Electronic Measurements and Instrumentation" offered to the ECE branch as Program Elective Course – Annexure- XXXIII
8. The proposed syllabus for the course titled "Embedded Systems" offered to the ECE branch as Program Elective Course – Annexure- XXXIV
9. The proposed syllabus for the course titled "Fibre Optic Communication" offered to the ECE branch as Program Elective Course – Annexure-XXXV
10. The proposed syllabus for the course titled "FPGA Design" offered to the ECE branch as Program Elective Course – Annexure-XXXVI
11. The proposed syllabus for the course titled "Global Positioning System" offered to the ECE branch as Program Elective Course – Annexure-XXXVII
12. The proposed syllabus for the course titled "Low Power VLSI Design" offered to the ECE branch as Program Elective Course – Annexure-XXXVIII
13. The proposed syllabus for the course titled "Radar Engineering" offered to the ECE branch as Program Elective Course – Annexure-XXXIX
14. The proposed syllabus for the course titled "RTL Design Verification" offered to the ECE branch as Program Elective Course – Annexure-XL
15. The proposed syllabus for the course titled "Satellite Communication" offered to the ECE branch as Program Elective Course – Annexure-XLI
16. The proposed syllabus for the course titled "Statistical Data Analysis" offered to the ECE branch as Program Elective Course – Annexure-XLII

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Item-4 : Approval of the syllabus of Open Elective courses & Other department courses offered by ECE

Resolution No: GVPCEW(A)/BOS-2/ECE/2024/4

It is resolved to recommend to the Academic Council that the following Open Elective courses and other department courses offered by ECE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Basic VLSI Design" offered as open elective to the other departments – Annexure-XLIII
2. The proposed syllabus for the course titled "Basics of Signal Processing" offered as open elective to the other departments – Annexure-XLIV
3. The proposed syllabus for the course titled "Data Communication" offered as open elective to the other departments – Annexure-XLV
4. The proposed syllabus for the course titled "Microprocessor & Controllers with Interfacing" offered as open elective to the other departments – Annexure-XLVI
5. The proposed syllabus for the course titled "Analog and Digital Circuits" offered to EEE branch in the II year I Semester – Annexure-XLVII
6. The proposed syllabus for the course titled "Analog and Digital Circuits Lab" offered to EEE branch in the II year I Semester – Annexure-XLVIII
7. The proposed syllabus for the course titled "Basics of Signals and Systems" offered to EEE branch as Program Elective Course – Annexure-XLIX
8. The proposed syllabus for the course titled "Embedded Systems Design" offered to EEE branch as Honors Course – Annexure-L

Item-5 : Approval of the subjects & syllabus related to Minor program in ECE

Resolution No: GVPCEW(A)/BOS-2/ECE/2024/5

It is resolved to recommend to the Academic Council that the following courses offered for Minor Program in ECE to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Analog and Digital Communication Systems" offered as Minor course in ECE – Annexure-LI
2. The proposed syllabus for the course titled "Digital System Modeling Through Verilog" offered as Minor course in ECE – Annexure-LII
3. The proposed syllabus for the course titled "Embedded C Programming" offered as Minor course in ECE – Annexure-LIII
4. The proposed syllabus for the course titled "Information Theory and Coding" offered as Minor course in ECE – Annexure-LIV
5. The proposed syllabus for the course titled "Mobile Cellular Communication" offered as Minor course in ECE – Annexure-LV

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Item-6 : Approval of the subjects & syllabus related to Honor program in ECE

Resolution No: GVPCEW(A)/BOS-2/ECE/2024/6

It is resolved to recommend to the Academic Council that the following courses offered for Honor Program in ECE to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "5G communication" offered as Honors course in ECE – Annexure-LVI
2. The proposed syllabus for the course titled "Application Specific Integrated Circuit" offered as Honors course in ECE – Annexure-LVII
3. The proposed syllabus for the course titled "Bio Medical Signal Processing" offered as Honors course in ECE – Annexure-LVIII
4. The proposed syllabus for the course titled "Design for Testability" offered as Honors course in ECE – Annexure-LIX
5. The proposed syllabus for the course titled "DSP Processors and Architectures" offered as Honors course in ECE – Annexure-LX
6. The proposed syllabus for the course titled "Wireless Sensor Network" offered as Honors course in ECE – Annexure-LXI

Item-7: Approval of Course Structure & syllabus of IInd Year MTech

Resolution No: GVPCEW(A)/BOS-2/ECE/2024/7

It is resolved to recommend to the Academic Council that the following Course structure & courses offered for II year M.Tech VLSI Design & Embedded Sytems Program in ECE to be effective from 2024 admitted batch onwards for approval.

1. It has been resolved to recommend to the Academic Council for approval, the course structure of 2nd year M. Tech Program as outlined in Annexure- LXII.
2. The proposed syllabus for the course titled "Memory Technologies" offered to the VLSID&ES branch in the II year I Semester as Program Elective Course– Annexure LXIII
3. The proposed syllabus for the course titled "Programming Languages for Embedded Software" offered to the VLSID&ES branch in the II year I Semester as Program Elective Course– Annexure LXIV
4. The proposed syllabus for the course titled "Universal Verification Methodologies" offered to the VLSID&ES branch in the II year I Semester as Program Elective Course– Annexure LXV

Resolution No: GVPCEW(A)/BOS-2/ECE/2024/8

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM – 530 048

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)
(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
Madhurawada :: Visakhapatnam – 530 048

Members Present:

Name of the Member	Designation	Signature
Dr.P.M.K.Prasad	Chairperson, BoS and Head, Dept of ECE	
Dr.L.Ganesh	Associate Professor	
Dr.B.Vijayalakshmi	Associate Professor	
Dr.D.V.A.N.Ravikumar	Associate Professor	
Ms. B V S Renuka Devi	Assistant Professor	
Ms.Ch.Sirisha	Assistant Professor	
Dr.M.Manikumari	Assistant Professor	
Mr.N.V.Maheswara Rao	Assistant Professor	
Ms.B.Lakshmi	Assistant Professor	
Ms.L.Sarika	Assistant Professor	
Mr.R.Sunil Kumar	Assistant Professor	
Mr.PVK Chaitanya	Assistant Professor	
Ms.N.Roopavathi	Assistant Professor	
Ms.B.Divyasathi	Assistant Professor	
Dr.P.V.Dileep Bhumireddi	Assistant Professor	
Ms. R Jalaja	Assistant Professor	
Ms.B.V.R.Gowri	Assistant Professor	
Prof.Tapan Kumar Gandhi	Subject Expert	
Prof.Venkata Mani V.	Subject Expert	
Prof.P.Rajesh Kumar	Vice Chancellor's Nominee	
Sri A.Venkata Krishna	Industry Representative	
Ms.Krishna Deepika Chittela	College Alumni	
Sri Amal Raj Pukkella	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM – 530 048

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)
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Madhurawada :: Visakhapatnam – 530 048

Members Present:

Name of the Member	Designation	Signature
Dr.P.M.K.Prasad	Chairperson, BoS and Head, Dept of ECE	
Dr.L.Ganesh	Associate Professor	
Dr.B.Vijayalakshmi	Associate Professor	
Dr.D.V.A.N.Ravikumar	Associate Professor	
Ms. B V S Renuka Devi	Assistant Professor	
Ms.Ch.Sirisha	Assistant Professor	
Dr.M.Manikumari	Assistant Professor	
Mr.N.V.Maheswara Rao	Assistant Professor	
Ms.B.Lakshmi	Assistant Professor	
Ms.L.Sarika	Assistant Professor	
Mr.R.Sunil Kumar	Assistant Professor	
Mr.PVK Chaitanya	Assistant Professor	
Ms.N.Roopavathi	Assistant Professor	
Ms.B.Divyasathi	Assistant Professor	
Dr.P.V.Dileep Bhumireddi	Assistant Professor	
Ms. R Jalaja	Assistant Professor	
Ms.B.V.R.Gowri	Assistant Professor	
Prof.Tapan Kumar Gandhi	Subject Expert	
Prof.Venkata Mani V.	Subject Expert	
Prof.P.Rajesh Kumar	Vice Chancellor's Nominee	
Sri A.Venkata Krishna	Industry Representative	
Ms.Krishna Deepika Chittela	College Alumni	Ch.K.Deepika
Sri Amal Raj Pukkella	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G.V.P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM – 53[illegible]

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI &ML)

Date: 03/08/2024

Minutes of 1st meeting of the Board of Studies in Computer Science and Engineering (AI &ML) department on 3rd August 2024 (Saturday) at 1.00 PM in hybrid mode.

The meeting of the Board of Studies in Computer Science and Engineering (AI &ML) department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024(Saturday) from 1.00 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B. Tech Programs offered by the Department of Electrical and Electronics Engineering under the regulations R – 2024 from the academic year 2024-25 onwards.

Members not present:

Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses

Members Present:

Person in Chair: Dr. D. K. Bebarta, HoD-CSE (AI&ML)

External Members:

Prof. S Vizianandа Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	Offline
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	Online
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	Online
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	Online
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	Expert for Special Courses	Offline

Internal Members:

Dr. M R K Krishna Rao, Professor	BoS Member	Offline
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	Offline
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	Offline
Mrs. H Gouthami Assistant Professor	BoS Member	Offline
Mr. P Siva Assistant Professor	BoS Member	Offline
Mrs. Sujatha Mudadla Assistant Professor	BoS Member	Offline

The joint Board of Studies meeting started with a welcome note by the Principal in the presence of BoS Chairmen, and Academic Council members wherein the salient features of the regulations R-2024 were highlighted. Next, the Principal requests the different Department of Board Chairman to discuss and approve the proposed syllabi of the first-year courses under R – 2024 regulations offered for various B. Tech Programs and M. Tech Programs (if applicable) from the academic year 2024-25.

The Board of Studies meeting of the Department of Computer Science and Engineering (AI &ML) started with a welcome note by the Chairman wherein he presented an outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Computer Science and Engineering (AI &ML) for B. Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B. Tech programs as requested by the Chairman of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/CSM/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B. Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course "Python Programming" offered to the CSE (AI&ML) branch in the I year II Semester. **Annexure-I**
2. The proposed syllabus for the course titled "Fundamentals of Computers" offered to the CSE (AI&ML) branch in the I year I Semester. **Annexure-II**
3. The proposed syllabus for the course "Python Programming Lab" offered to the CSE (AI&ML) branch in the I year II Semester. **Annexure-III**
4. The proposed syllabus for the course titled "Computer Engineering Workshop" offered to the CSE (AI&ML) branch in the I year I Semester – **Annexure-IV**
5. The proposed syllabus for the course "Problem solving using C" offered to the CSE (AI&ML) branch in the I year I Semester. **Annexure-V**
6. The proposed syllabus for the course titled "Web Technologies Fundamentals Lab" offered to the CSE (AI&ML) branch in the I year II Semester. **Annexure-VI**
7. The proposed syllabus for the course "Problem solving using C Lab" offered to the CSE (AI&ML) branch in the I year I Semester. **Annexure-VII**

Resolution No: GVPCEW(A)/BOS/CSM/2024/2

The Board Members unanimously authorize the Chairman to make minor modifications in the title/content of a course if necessary.

The meeting is concluded by thanking all the BoS members present in online or offline mode.

Members Present:

BoS Member's Name	Designation	Signature
Dr. D. K. Bebarta, HoD-CSE (AI&ML)	Chairman	
Dr. M R K Krishna Rao, Professor	BoS Member	
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	
Mrs. H Gouthami Assistant Professor	BoS Member	
Mr. P Siva Assistant Professor	BoS Member	
Mrs. Sujatha Mudadla Assistant Professor	BoS Member	
Prof. S Viziananda Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Dwiti Krishna Bebarta
HoD-CSE (AI&ML)

Resolution No: GVPCEW(A)/BOS/CSM/2024/2

The Board Members unanimously authorize the Chairman to make minor modifications in the title/content of a course if necessary.

The meeting is concluded by thanking all the BoS members present in online or offline mode.

Members Present:

BoS Member's Name	Designation	Signature
Dr. D. K. Bebarta, HoD-CSE (AI&ML)	Chairman	
Dr. M R K Krishna Rao, Professor	BoS Member	
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	
Mrs. H Gouthami Assistant Professor	BoS Member	
Mr. P Siva Assistant Professor	BoS Member	
Mrs. Sujatha Mudadla Assistant Professor	BoS Member	
Prof. S Viziananda Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	Debi Prosad Dogra
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Dwiti Krishna Bebarta
HoD-CSE (AI&ML)

Resolution No: GVPCEW(A)/BOS/CSM/2024/2

The Board Members unanimously authorize the Chairman to make minor modifications in the title/content of a course if necessary.

The meeting is concluded by thanking all the BoS members present in online or offline mode.

Members Present:

BoS Member's Name	Designation	Signature
Dr. D. K. Bebarta, HoD-CSE (AI&ML)	Chairman	
Dr. M R K Krishna Rao, Professor	BoS Member	
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	
Mrs. H Gouthami Assistant Professor	BoS Member	
Mr. P Siva Assistant Professor	BoS Member	
Mrs. Sujatha Mudadla Assistant Professor	BoS Member	
Prof. S Viziananda Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	Anjali Mohapatra. 03/08/2024
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Dwiti Krishna Bebarta
HoD-CSE (AI&ML)

Resolution No: GVPCEW(A)/BOS/CSM/2024/2

The Board Members unanimously authorize the Chairman to make minor modifications in the title/content of a course if necessary.

The meeting is concluded by thanking all the BoSmembers present in online or offline mode.

Members Present:

BoS Member's Name	Designation	Signature
Dr. D. K. Bebarta, HoD-CSE (AI&ML)	Chairman	
Dr. M R K Krishna Rao, Professor	BoS Member	
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	
Mrs. H Gouthami Assistant Professor	BoS Member	
Mr. P Siva Assistant Professor	BoS Member	
Mrs. SujathaMudadla Assistant Professor	BoS Member	
Prof. S Viziananda Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Debi ProsadDogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	
Dr M SubrahmanyaSarma, Vice President, Accenture	Industry Representative	M S Sarma
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. VivekithaSagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Dwiti Krishna Bebarta

HoD-CSE (AI&ML)

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Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Minutes of 1st meeting of the Board of Studies in Electrical and Electronics Engineering department on 3rd August 2024(Saturday) at 1 PM in hybrid mode

The meeting of the Board of Studies in Electrical and Electronics Engineering department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024(Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs offered by the Department of Electrical and Electronics Engineering under the regulations R–2024 from the academic year 2024-25 onwards.

Members Present:

Dr R V S Lakshmi Kumari - Chairperson

External Members:

1	Dr K Srikumar, Professor, Dept of EEE JNTU-GV, Vizianagaram	Subject Expert	Offline
2	Dr A Hemachander, Assistant Professor, Dept of EEE NIT-Puducherry, Puducherry	Subject Expert	Online
3	Dr P Mallikarjuna Rao, Professor & Head of the Dept of Electrical & Electronics Engineering, AU College of Engineering, Visakhapatnam	Vice Chancellor's Nominee	Online
4	Dr M Santhosh Kumar, System Design Engineer Sensata Technologies, Pune	Industry Representative	Online
5	Ms Ch Vijayalakshmi, Junior Electrical Engineer ACUTRONIC India Pvt Ltd Hyderabad	College Alumni	Offline
6	Ms I Kavya, Associate Senior Electrical Engineer Burnsand Mc Donnells India Pvt Ltd Bangalore	Expert for Special Courses	Offline

Internal Members:

1	Dr. P. Devendra	Associate Professor	Offline
2	Dr ASV Vijaya Lakshmi	Assistant Professor	Offline
3	Dr M Krishna	Assistant Professor	Offline

4	Mrs V Sree Vidhya	Assistant Professor	Offline
5	Mr Y Ramu	Assistant Professor	Offline
6	Mr D Srinivas Reddy	Assistant Professor	Offline
7	Ms P Sai Jyothi	Assistant Professor	Offline
8	Mrs B Kusuma Kumari	Assistant Professor	Offline
9	Mr A Srinivasa Rao	Assistant Professor	Offline
10	Ms P Hemalatha	Assistant Professor	Offline

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R–2024 regulations offered for various B.Tech Programs and M.Tech Programs (if applicable) from the academic year 2024-25.

The Board of Studies meeting of the Department of Electrical and Electronics Engineering started with a welcome note by the Chairperson wherein she presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R–2024 regulations offered by the Department of Electrical and Electronics Engineering for B.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/EEE/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Fundamentals of Electrical Engineering" offered to the EEE branch in the I year I Semester – ***Annexure-I***
2. The proposed syllabus for the course titled "Electrical Circuits - 1" offered to the EEE branch in the I year II Semester – ***Annexure-II***
3. The proposed syllabus for the course titled "Thermal & Hydro Prime Movers" offered to the EEE branch in the I year II Semester – ***Annexure-III***
4. The proposed syllabus for the practical course titled "Electrical Engineering Workshop" offered to the EEE branch in the I year II Semester – ***Annexure-IV***
5. The proposed syllabus for the course titled "Network Theory and Machines" offered to the ECE branch in the I year I Semester – ***Annexure-V***

Resolution No: GVPCEW(A)/BOS/EEE/2024/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr R V S Lakshmi Kumari	Chairperson, BoS and Head, Dept of EEE	RVSL 3/8/24
Dr. P. Devendra	Associate Professor	
Dr ASV Vijaya Lakshmi	Assistant Professor	
Dr M Krishna	Assistant Professor	
Mrs V Sree Vidhya	Assistant Professor	
Mr Y Ramu	Assistant Professor	
Mr D Srinivas Reddy	Assistant Professor	
Ms P Sai Jyothi	Assistant Professor	
Mrs B Kusuma Kumari	Assistant Professor	
Mr A Srinivasa Rao	Assistant Professor	
Ms P Hemalatha	Assistant Professor	
Dr K Srikumar	Subject Expert	3/8/24
Dr A Hemachander	Subject Expert	
Dr P Mallikarjuna Rao	Vice Chancellor's Nominee	
Dr M Santhosh Kumar	Industry Representative	
Ms Ch Vijayalakshmi	College Alumni	
Ms I Kavya	Expert for Special Courses	

RVSL 3/8/24

Chairperson, BoS

Head
Dept. of Electrical & Electronics Engineering
G.V.P. College of Engineering for Women
Madhurawada
VISAKHAPATNAM-530 048

Members Present:

Name of the Member	Designation	Signature
Dr R V S Lakshmi Kumari	Chairperson, BoS and Head, Dept of EEE	RVSL 3/8/24
Dr. P. Devendra	Associate Professor	
Dr ASV Vijaya Lakshmi	Assistant Professor	
Dr M Krishna	Assistant Professor	
Mrs V Sree Vidhya	Assistant Professor	
Mr Y Ramu	Assistant Professor	
Mr D Srinivas Reddy	Assistant Professor	D. Srinivas
Ms P Sai Jyothi	Assistant Professor	
Mrs B Kusuma Kumari	Assistant Professor	B. Kusuma Kumari
Mr A Srinivasa Rao	Assistant Professor	A. Srinivasa Rao
Ms P Hemalatha	Assistant Professor	Hemalatha
Dr K Srikumar	Subject Expert	3/8/24
Dr A Hemachander	Subject Expert	A. Hemachander
Dr P Mallikarjuna Rao	Vice Chancellor's Nominee	
Dr M Santhosh Kumar	Industry Representative	
Ms Ch Vijayalakshmi	College Alumni	
Ms I Kavya	Expert for Special Courses	

RVSL 3/8/24
Chairperson, BoS

Members Present:

Name of the Member	Designation	Signature
Dr R V S Lakshmi Kumari	Chairperson, BoS and Head, Dept of EEE	RVSL 3/8/24
Dr. P. Devendra	Associate Professor	
Dr ASV Vijaya Lakshmi	Assistant Professor	
Dr M Krishna	Assistant Professor	
Mrs V Sree Vidhya	Assistant Professor	
Mr Y Ramu	Assistant Professor	
Mr D Srinivas Reddy	Assistant Professor	
Ms P Sai Jyothi	Assistant Professor	
Mrs B Kusuma Kumari	Assistant Professor	
Mr A Srinivasa Rao	Assistant Professor	
Ms P Hemalatha	Assistant Professor	
Dr K Srikumar	Subject Expert	3/8/24
Dr A Hemachander	Subject Expert	
Dr P Mallikarjuna Rao	Vice Chancellor's Nominee	
Dr M Santhosh Kumar	Industry Representative	
Ms Ch Vijayalakshmi	College Alumni	
Ms I Kavya	Expert for Special Courses	

RVSL 3/8/24
Chairperson, BoS

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF INFORMATION TECHNOLOGY

Minutes of 1st meeting of the Board of Studies in Information Technology department on 3rd August 2024 (Saturday) at 1 PM in hybrid mode.

The meeting of the Board of Studies in Information Technology department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024 (Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B. Tech Programs offered by the Department of Information Technology under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr. M. Bhanu Sridhar – Chairman & HOD, Dept. of Information Technology

External Members:

1	Prof. Kunjam Nageswara Rao Dept. of Information Technology AU College of Engineering, Visakhapatnam	Vice Chancellor's Nominee	OFFLINE
2	Prof Rashmi Ranjan Rout Professor, Dept of CSE NIT-Warangal	Subject Expert	ONLINE
3	Dr. N. Rukma Rekha Associate Professor, Dept of CSE University of Hyderabad Hyderabad	Subject Expert	OFFLINE
4	Mr. Sasidhar Maruvada Managing Director nu Vizz Software Solutions Bengaluru	Industry Representative	ONLINE
5	Ms. G. Dhana Lakshmi Assistant Professor Dept of CSE, JNTUKCE JNTUK-Kakinada	College Alumni	OFFLINE
6	Mr. Ayyalasomayajula Siva Sankar Principal Consultant/Key Product Manager, Sposea B.V., Bengaluru	Expert for Special Courses	OFFLINE

Internal Members:

1	Dr. C. Srinivas	Associate Professor	OFFLINE
2	Mrs. R. Sridevi	Assistant Professor	OFFLINE
3	Mrs. P. Sridevi,	Assistant Professor	OFFLINE
4	Mr. Ch. V. V. D. Prasad	Assistant Professor	Pursuing Ph. D in IIT Varanasi through Quality Improvement Program
5	Ms. M. Deepthi	Assistant Professor	OFFLINE
6	Mr. G. Tirupati	Assistant Professor	OFFLINE
7	Mr. G. Appaji	Assistant Professor	OFFLINE

The joint Board of Studies meeting started with a welcome note by the Principal in the presence of BoS Chairmen, and Academic Council members wherein the salient features of the regulations R-2024 were highlighted. Next, the Principal requested the different Departments' Board Chairpersons to discuss and approve the proposed syllabi of the first-year courses under R – 2024 regulations offered for various B. Tech Programs and M. Tech Programs (if applicable) from the academic year 2024-25.

The Board of Studies meeting of the Department of Information Technology started with a welcome note by the Chairman wherein he presented an outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and productive deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Information Technology for B. Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B. Tech programs as requested by the Chairman of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/IT/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B. Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled 'Python Programming' offered to the IT branch in the I year II Semester – Annexure-I
2. The proposed syllabus for the course titled 'Fundamentals of Computers' offered to the IT branch in the I year I Semester – Annexure-II
3. The proposed syllabus for the course titled 'Python Programming Lab' offered to the IT branch in the I year II Semester – Annexure-III
4. The proposed syllabus for the course titled 'Computer Engineering Workshop Lab' offered to the IT branch in the I year I Semester – Annexure-IV

5. The proposed syllabus for the course titled 'Problem Solving Using C' offered to the IT branch in the I year I Semester – Annexure-V
6. The proposed syllabus for the course titled 'Web Technologies Fundamentals Lab' offered to the IT branch in the I year II Semester – Annexure-VI
7. The proposed syllabus for the course titled 'Problem Solving Using C Lab' offered to the IT branch in the I year I Semester – Annexure-VII

Resolution No: GVPCEW(A)/BOS/IT/2024/2

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course, if necessary.
The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr. M. Bhanu Sridhar	Chairman of BOS and HOD, Department of Information Technology	
Prof. Kunjam Nageswara Rao, Professor and HOD, Dept. of IT, AU, Visakhapatnam	Vice Chancellor's Nominee	
Prof. Rashmi Ranjan Rout Professor, Dept of CSE NIT-Warangal	Subject Expert	
Dr. N. Rukma Rekha Associate Professor, Dept of CSE University of Hyderabad Hyderabad	Industry Representative	
Mr. Sasidhar Maruvada Managing Director nu Vizz Software Solutions Bengaluru	College Alumni	
Ms. G. Dhana Lakshmi Assistant Professor Dept of CSE, JNTUKCE JNTUK-Kakinada	Expert for Special Courses	
Mr. Ayyalasomayajula Siva Sankar Principal Consultant/Key Product Manager, Sposea B.V., Bengaluru	BoS Member	
Dr. C. Srinivas	BoS Member	
Mrs. R. Sridevi	BoS Member	R. Sridevi
Mrs. P. Sridevi	BoS Member	P. Sridevi
Ms. M. Deepthi	BoS Member	
Mr. G. Tirupati	BoS Member	
Mr. G. Appaji	BoS Member	

Chairman, BOS
Dept. of Information Technology

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Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Minutes of 1st meeting of the Board of Studies in Electronics and Communication Engineering department on 3rd August 2024(Saturday) at 1 PM in hybrid mode

The meeting of the Board of Studies in Electronics and Communication Engineering department of Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 3rd August 2024(Saturday) from 1 PM onwards to finalize the syllabi of the first year (1st semester and 2nd semester) courses of all B.Tech Programs and first year((1st semester and 2nd semester) courses of M.Tech programs offered by the Department of Electronics and Communication Engineering under the regulations R – 2024 from the academic year 2024-25 onwards.

Members Present:

Dr P.M.K.Prasad - Chairperson

External Members:

1	Prof. Tapan Kumar Gandhi Professor, Department of Electrical Engineering Indian Institute of Technology, Delhi	Subject Expert	Online
2	Prof.Venkata Mani V. Professor Dept.of ECE, National Institute of Technology, Warangal	Subject Expert	Offline
3	Prof.P.Rajesh Kumar Professor Dept.of Electronics and Communication Engineering AU College of Engineering (A) Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Sri A.Venkata Krishna CEO , Ascentsemi R & D Pvt.Ltd Bengaluru	Industry Representative	Offline
5	Ms.Krishna Deepika Chittela Staff Engineer Synoposys, Bengaluru	College Alumni	Online
6	Sri Amal Raj Pukkella Founder, Digifac Services Pvt.Ltd & COO, Headfitted Pvt Ltd Visakhapatnam	Expert for Special Courses	Offline

Internal Members:

1	Dr.L.Ganesh	Associate Professor	Offline
2	Dr.B.Vijayalakshmi	Associate Professor HEAD	Offline

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

3	Dr.D.V.A.N.Ravikumar	Associate Professor	Offline
4	Ms.B.V.S.Renuka Devi	Assistant Professor	On leave
5	Ms.Ch.Sirisha	Assistant Professor	Offline
6	Dr.M.Manikumari	Assistant Professor	Offline
7	Mr.N.V.Maheswara Rao	Assistant Professor	Offline
8	Ms.B.Lakshmi	Assistant Professor	Offline
9	Ms.L.Sarika	Assistant Professor	Offline
10	Mr.R.Sunil Kumar	Assistant Professor	Offline
11	Mr.PVK Chaitanya	Assistant Professor	Offline
12	Ms.N.Roopavathi	Assistant Professor	Offline
13	Ms.B.Divyasathi	Assistant Professor	Offline
14	Dr.P.V.Dileep Bhumireddi	Assistant Professor	Offline
15	Ms.R.Jalaja	Assistant Professor	Maternity leave
16	Ms.M.Hemlata	Assistant Professor	On Leave
17	Ms.BVR Gowri	Assistant Professor	Offline
18	Ms.K.Aishawrya	Assistant Professor	On leave

The meeting started with a welcome note by the Principal & Chairman, Academic Council wherein the salient features of the regulations R-2024 was highlighted to joint Board of Studies. Next, the Principal requested the different Department Board Chairmen/Chairpersons to discuss and approve the proposed syllabi of the first year courses under R – 2024 regulations offered for various B.Tech Programs and M.Tech Programs from the academic year 2024-25.

The Board of Studies meeting of the Department of Electronics and Communication Engineering started with a welcome note by the Chairperson wherein she presented a outline of the regulations R-2024 and requested the Board to discuss and approve the proposed syllabi.

After serious and fruitful deliberations on the proposed syllabi of the courses under R – 2024 regulations offered by the Department of Electronics and Communication Engineering for B.Tech and M.Tech Programs from the academic year 2024-25 onwards, the Board agreed to offer courses for different B.Tech,M.Tech programs as requested by the Chairperson of the respective BoS of other Engineering Departments. The Board unanimously resolved the following:

Resolution No: GVPCEW(A)/BOS/ECE/2024/1

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Electronic Devices and Circuits " offered to the ECE branch in the I year I Semester – Annexure-I

2. The proposed syllabus for the course titled "Electronic Devices and Circuits Lab " offered to the ECE branch in the I year I Semester – Annexure-II

3. The proposed syllabus for the course titled "Basic Electronics Engineering " offered to the EEE branch in the I year I semester – Annexure-III

4. The proposed syllabus for the course titled "Elements of Electronics Engineering " offered to the CSM,CSE,IT branch in the I year I semester/II Semester-Annexure-IV

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ELECTRONICS AND COMMUNICATION ENGINEERING
G.V.P.COLLEGE OF ENGINEERING FOR WOMEN

5. The proposed syllabus for the course titled "Digital Logic Design " offered to the ECE branch in the I year II Semester – Annexure-V

6. The proposed syllabus for the course titled "Electronic Circuit Analysis " offered to the ECE branch in the I year II Semester – Annexure-VI

7. The proposed syllabus for the course titled "Digital Logic Design lab " offered to the ECE branch in the I year II Semester – Annexure-VII

8. The proposed syllabus for the course titled "Electronic Circuit Analysis lab " offered to the ECE branch in the I year II Semester – Annexure-VIII

Resolution No: GVPCEW(A)/BOS/ECE/2024/2

It is resolved to recommend to the Academic Council that the following courses offered for M.Tech Programs to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Analog and Digital CMOS VLSI Design" offered to the ECE branch in the I year I Semester – Annexure-IX

2. The proposed syllabus for the course titled "Embedded systems Design " offered to the ECE branch in the I year I Semester – Annexure-X

3. The proposed syllabus for the course titled "Application Specific Integrated Circuit(ASIC) " offered to the ECE branch in the I year I Semester – Annexure-XI

4. The proposed syllabus for the course titled "Advanced Operating Systems" offered to the ECE branch in the I year I Semester – Annexure-XII

5. The proposed syllabus for the course titled "Parallel Processing" offered to the ECE branch in the I year I Semester – Annexure-XIII

6. The proposed syllabus for the course titled "CPLD and FPGA Architectures & Applications" offered to the ECE branch in the I year I Semester – Annexure-XIV

7. The proposed syllabus for the course titled "Electronic Design Automation Tools " offered to the ECE branch in the I year I Semester – Annexure-XV

8. The proposed syllabus for the course titled "Digital System Design " offered to the ECE branch in the I year I Semester – Annexure-XVI

9. The proposed syllabus for the course titled "Analog and Digital CMOS VLSI Design Lab " offered to the ECE branch in the I year I Semester – Annexure-XVII

10. The proposed syllabus for the course titled "Embedded systems Design Lab " offered to the ECE branch in the I year I Semester – Annexure-XVIII

11. The proposed syllabus for the course titled "RTL Design & Verification using System Verilog" offered to the ECE branch in the I year II Semester – Annexure-XIX

12. The proposed syllabus for the course titled "Internet of Things and its applications " offered to the ECE branch in the I year II Semester – Annexure-XX

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13. The proposed syllabus for the course titled "Low power VLSI Design " offered to the ECE branch in the I year II Semester – Annexure-XXI

14. The proposed syllabus for the course titled "System on Chip Design " offered to the ECE branch in the I year II Semester – Annexure-XXII

15. The proposed syllabus for the course titled "Digital signal and Image Processing " offered to the ECE branch in the I year II Semester – Annexure-XXIII

16. The proposed syllabus for the course titled "Communication Buses and Interfaces "offered to the ECE branch in the I year II Semester – Annexure-XXIV

17. The proposed syllabus for the course titled "Design for Testability "offered to the ECE branch in the I year II Semester – Annexure-XXV.

18. The proposed syllabus for the course titled "DSP Processors and Architectures "offered to the ECE branch in the I year II Semester – Annexure-XXVI

19.The proposed syllabus for the course titled "RTL Design & Verification using System Verilog lab " offered to the ECE branch in the I year II Semester – Annexure-XXVII.

20. The proposed syllabus for the course titled "Internet of Things and its applications lab offered to the ECE branch in the I year II Semester – Annexure-XXVIII

21. The proposed syllabus for the course titled "Mini project with seminar " offered to the ECE branch in the I year II Semester – Annexure-XXIX

Resolution No: GVPCEW(A)/BOS/ECE/2024/3

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr.P.M.K.Prasad	Chairperson, BoS and Head, Dept of ECE	
Dr.L.Ganesh	Associate Professor	
Dr.B.Vijayalakshmi	Associate Professor	
Dr.D.V.A.N.Ravikumar	Associate Professor	
Ms.Ch.Sirisha	Assistant Professor	
Dr.M.Manikumari	Assistant Professor	
Mr.N.V.Maheswara Rao	Assistant Professor	
Ms.B.Lakshmi	Assistant Professor	
Ms.L.Sarika	Assistant Professor	
Mr.R.Sunil Kumar	Assistant Professor	
Mr.PVK Chaitanya	Assistant Professor	
Ms.N.Roopavathi	Assistant Professor	
Ms.B.Divyasathi	Assistant Professor	
Dr.P.V.Dileep Bhumireddi	Assistant Professor	

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

Ms.B.V.R.Gowri	Assistant Professor	
Dr. Tapan Kumar Gandhi	Subject Expert	
Prof.Venkata Mani V.	Subject Expert	
Prof.P.Rajesh Kumar	Vice Chancellor's Nominee	
Sri A.Venkata Krishna	Industry Representative	
Ms.Krishna Deepika Chittela	College Alumni	
Sri Amal Raj Pukkella	Expert for Special Courses	

Chairperson, BoS

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR W
MADHURAWADA, VISAKHAPATNAM -- 5

Ms.B.V.R.Gowri	Assistant Professor	
Prof.Tapan Kumar Gandhi	Subject Expert	
Prof.Venkata Mani V.	Subject Expert	
Prof.P.Rajesh Kumar	Vice Chancellor's Nominee	
Sri A.Venkata Krishna	Industry Representative	
Ms.Krishna Deepika Chittela	College Alumni	
Sri Amal Raj Pukkella	Expert for Special Courses	

Chairperson , BoS

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERIING FOR WO
MADHURAWADA, VISAKHAPATNAM – 5

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)
Madhurawada :: Visakhapatnam – 530048
(Approved by AICTE, New Delhi and Affiliated to Andhra University, Visakhapatnam)
(Accredited by NBA for B.Tech-CSE, ECE, IT and EEE)
(Accredited by NAAC with A Grade from 2022-2023 to 2027-2028)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI &ML)

Date: 29 /03/2025

Minutes of 2nd meeting of the Board of Studies in Computer Science and Engineering (AI&ML) Department held on 28th & 29th March 2025 (Friday & Saturday) from 10:00AM to 04:00PM in hybrid mode

The meeting of the Board of Studies in the Department of Computer Science and Engineering (AI&ML), Gayatri Vidya Parishad College of Engineering for Women (Autonomous) is held on 28th & 29th March 2025 (Friday & Saturday) to finalize the course structure and syllabi of the 2nd, 3rd & 4th year (1st semester and 2nd semester) courses of all B. Tech Program offered by the Department under the regulations R – 24 from the academic year 2024-25 onwards.

Member not present:

Mr. Rajesh Srinivasan	Vice President, CGI India	Expert for Special Courses

Members Present:

Person in Chair: Dr. D. K. Bebarta, HoD-CSE (AI&ML)

External BoS Members:

Prof. S Viziananda Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	Offline
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	Online
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	Online and Offline
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	Online
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	Offline

Internal BoS Members:

Dr. M R K Krishna Rao, Professor	BoS Member	Online and Offline
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	Offline
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	Offline

Head of Department
Dept. of Computer Science
GVP College of Engineering for Women

Mrs. H Gouthami Assistant Professor	BoS Member	Offline
Mr. P Siva Assistant Professor	BoS Member	Offline
Mrs. Sujatha Mudadla Assistant Professor	BoS Member	Offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B. Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B. Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B. Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B. Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of Computer Science and Engineering (AI&ML) commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, 3rd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B. Tech program under R-24 regulations, the Board collectively agreed to implement the proposed courses in B. Tech program, CSE (AI&ML).

The Board unanimously resolved the following:

Item-1: Presentation of B. Tech - CSE (AI&ML) Course Structure

The Chairman has presented the Course Structure of the B. Tech. – CSE (AI&ML) program to the board members for **review, discussion, and approval as per R-24 regulations.**

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/1

It has been resolved to recommend to the Academic Council for approval that the **Course Structure**, as outlined in **Annexure-I with highlighting key revisions and updates** be implemented for the **B. Tech - CSE (AI&ML) Program** effective from **2024-2025 admitted batch onwards**.

Item-2: Presentation of syllabus of core courses in II, III & IV B. Tech - CSE (AI&ML) Program

The Chairman has presented the syllabus of **Program Core (PC), Engineering Sciences (ES) and Skill Courses (SC)** of the **II, III & IV B. Tech - CSE (AI&ML) program** to the board members for **discussion, and approval in accordance with the R-24 regulations.**

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/2

It is resolved to recommend to the Academic Council that the following courses offered for B. Tech - CSE (AI&ML) Program effective from **2024-2025 admitted batch onwards** for approval.

1. The proposed syllabus for the course titled "Data Structures" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure-II.
2. The proposed syllabus for the course titled "Object Oriented Programming through Java" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure-III.
3. The proposed syllabus for the course titled "Database Management Systems" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure-IV.
4. The proposed syllabus for the lab course titled "Data Structures Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure- V.
5. The proposed syllabus for the lab course titled "Object Oriented Programming through Java Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure-VI.
6. The proposed syllabus for the lab course titled "Database Management Systems Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure-VII.
7. The proposed syllabus for the course titled "Skill Development Course-I: (Continuous Integration and Continuous Delivery using DevOps)" offered to the **B. Tech - CSE (AI&ML)** branch in the II year I Semester – Annexure- VIII.
8. The proposed syllabus for the course titled "Computer Organization" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-IX.
9. The proposed syllabus for the course titled "Design and Analysis of Algorithms" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-X.
10. The proposed syllabus for the course titled "Data Warehousing and Data Mining" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-XI.
11. The proposed syllabus for the course titled "Artificial Intelligence" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-XII.
12. The proposed syllabus for the lab course titled "Algorithms Lab through C+" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-XIII.
13. The proposed syllabus for the lab course titled "Data Mining Lab using Python" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-XIV.
14. The proposed syllabus for the skill course titled "Skill Development Course-II: MERN Stack Development" offered to the **B. Tech - CSE (AI&ML)** branch in the II year II Semester – Annexure-XV.
15. The proposed syllabus for the course titled "Formal Language and Automata Theory" offered to the **B. Tech - CSE (AI&ML)** branch in the III year I Semester – Annexure-XVI.
16. The proposed syllabus for the course titled "Operating Systems" offered to the **B. Tech - CSE (AI&ML)** branch in the III year I Semester – Annexure-XVII.
17. The proposed syllabus for the course titled "Machine Learning" offered to the **B. Tech - CSE (AI&ML)** branch in the III year I Semester – Annexure-XVIII.
18. The proposed syllabus for the lab course titled "Operating Systems Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the III year I Semester – Annexure-XIX.
19. The proposed syllabus for the lab course titled "Machine Learning Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the III year I Semester – Annexure-XX.
20. The proposed syllabus for the course titled "Computer Networks" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXI.
21. The proposed syllabus for the course titled "Big Data Analytics" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXII.

Head of Department

22. The proposed syllabus for the course titled "Deep Learning Techniques" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXIII.
23. The proposed syllabus for the lab course titled "Computer Networks Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXIV.
24. The proposed syllabus for the lab course titled "Big Data Analytics Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXV.
25. The proposed syllabus for the lab course titled "Deep Learning Techniques Lab" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXVI
26. The proposed syllabus for the skill course titled "Skill Development Course-IV: MLOps with Cloud Platform" offered to the **B. Tech - CSE (AI&ML)** branch in the III year II Semester – Annexure-XXVII.
27. The proposed syllabus for the skill course titled "Skill Development Course-V: Generative AI and Prompt Engineering" offered to the **B. Tech - CSE (AI&ML)** branch in the IV year I Semester – Annexure-XXVIII.

Item-3: Approval of syllabus of Professional Elective courses for B. Tech - CSE (AI&ML) Program.

The Chairman has presented the syllabus of **Professional Elective courses for B. Tech - CSE (AI&ML) program** to the board members for **discussion, and approval in accordance with the R-24 regulations.**

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/3

1. The proposed syllabus for the course titled "API and Micro Services" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXIX.
2. The proposed syllabus for the course titled "Ethical Hacking" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXX.
3. The proposed syllabus for the course titled "Generative AI Models" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXI.
4. The proposed syllabus for the course titled "Mobile App Development" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXII.
5. The proposed syllabus for the course titled "Soft Computing" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXIII.
6. The proposed syllabus for the course titled "Computer Vision" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXIV.
7. The proposed syllabus for the course titled "Cybersecurity and Digital Forensics" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXV.
8. The proposed syllabus for the course titled "Fog and Edge Computing" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXVI.
9. The proposed syllabus for the course titled "NoSQL Databases" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXVII.
10. The proposed syllabus for the course titled "Data Science" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXVIII.
11. The proposed syllabus for the course titled "Principles of Compiler Design" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XXXIX.
12. The proposed syllabus for the course titled "Natural Language Processing" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XL.
13. The proposed syllabus for the course titled "AI Chatbots" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XLI.

Head of Department

14. The proposed syllabus for the course titled "Modern Cryptography & Network Security" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XLII.
15. The proposed syllabus for the course titled "Reinforcement Learning" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XLIII.
16. The proposed syllabus for the course titled "Software Engineering" offered to the **B. Tech - CSE (AI&ML)** branch- Annexure-XLIV.

Item-4: Approval of syllabus of Open Elective courses offered by CSE (AI&ML) department to other branches.

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/4

1. The proposed syllabus for the course titled "Introduction to AI Chatbots" offered as Open Elective to other branches – Annexure-XLV.
2. The proposed syllabus for the course titled "Natural Language Processing and Applications" offered as Open Elective to other branches – Annexure- XLVI.
3. The proposed syllabus for the course titled "Python for Data Science" offered as Open Elective to other branches – Annexure-XLVII

Item-5: Approval of syllabus of minor courses offered by CSE (AI&ML) department to other branches.

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/5

1. The proposed syllabus for the course titled "Artificial Intelligence and Machine Learning" offered as Minor Course to other branches – Annexure-XLVIII.
2. The proposed syllabus for the course titled "Fundamentals of Business Analytics" offered as Minor Course to other branches – Annexure-XLIX.
3. The proposed syllabus for the course titled "Introduction to Deep Learning" offered as Minor Course to other branches – Annexure-L.
4. The proposed syllabus for the course titled "Reinforcement Learning Techniques" offered as Minor Course to other branches – Annexure-LI

Item-6: Approval of syllabus of Honours courses for B. Tech - CSE (AI&ML) Program.

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/6

1. The proposed syllabus for the course titled "Quantum Computing" offered as Honour's Course to the **B. Tech - CSE (AI&ML)** branch – Annexure-LII.
2. The proposed syllabus for the course titled "Social Media Analysis" offered as Honour's Course to the **B. Tech - CSE (AI&ML)** branch – Annexure-LIII.
3. The proposed syllabus for the course titled "High Performance Computing" offered as Honour's Course to the **B. Tech - CSE (AI&ML)** branch – Annexure-LIV.
4. The proposed syllabus for the course titled "Business Analytics" offered as Honour's Course to the **B. Tech - CSE (AI&ML)** branch – Annexure-LV.
5. The proposed syllabus for the course titled "Data Visualization" offered as Honour's Course to the **B. Tech - CSE (AI&ML)** branch – Annexure-LVI.

Item-7: Approval of syllabus of other courses offered by CSE (AI&ML) department to other branches.

Resolution No: GVPCEW(A)/BOS-2/CSM/2025/7

1. The proposed syllabus for the course titled "Machine Learning using Python" offered as Skill Course to the B. Tech – EEE branch in IV-I– Annexure-LVII.

Head of Department

Item-8: Any other matter

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting is concluded by thanking all the members.

Members Present:

BoS Member's Name	Designation	Signature
Dr. D. K. Bebarta, HoD-CSE (AI&ML)	Chairman	
Dr. M R K Krishna Rao, Professor	BoS Member	
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. B. Santhoshi Assistant Professor	BoS Member	
Mrs. H Gouthami Assistant Professor	BoS Member	
Mr. P Siva Assistant Professor	BoS Member	
Mrs. Sujatha Mudadla Assistant Professor	BoS Member	
Prof. S Vizianandа Row, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	
Dr. Anjali Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Dwiti Krishna Bebarta
HoD-CSE (AI&ML)
Head of Department
Dept. of Computer Science & Engineering (AIML)
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/ contents of a course if necessary.

The meeting is concluded by thanking all the members.

Members Present:

BoS Member's Name	Designation	Signature
Dr. D. K. Behera, (HoD-CSE (AI&ML))	Chairman	
Dr. M S K Krishna Rao, Professor	BoS Member	
Dr. K Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. H Santhoshi, Assistant Professor	BoS Member	
Mrs. H Goutham, Assistant Professor	BoS Member	
Mr. P Siva, Assistant Professor	BoS Member	
Mrs. Sujatha Mudadla, Assistant Professor	BoS Member	
Prof. S Viswanadha Raju, Professor & Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Dalli Prasad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	
Dr. Angati Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	M S Sarma
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. Vivekisha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Dalli Krishna Behera
HoD-CSE (AI&ML)

Item.8: Any other matter

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/contents of a course if necessary.

The meeting is concluded by thanking all the members.

Members Present

BoS Member's Name	Designation	Signature
Dr. D. K. Behera, HoD-CSE (AI&ML)	Chairman	
Dr. M R K Krishna Rao, Professor	BoS Member	
Dr. K. Purushotam Naidu, Assistant Professor	BoS Member	
Mrs. D. B. Santhoshi, Assistant Professor	BoS Member	
Mrs. B Goutham, Assistant Professor	BoS Member	
Mr. P Siva, Assistant Professor	BoS Member	
Mrs. Sujatha Mudadla, Assistant Professor	BoS Member	
Prof. S Viswananda Rao, Professor, Computer Science and Systems Engineering, Andhra University, Visakhapatnam	Vice Chancellor's Nominee	
Dr. Debi Prosad Dogra, Asso. Professor, IIT Bhubaneswar	Subject Expert	
Dr. Anjan Mahapatra, Asst. Professor, IIIT, Bhubaneswar	Subject Expert	
Dr M Subrahmanya Sarma, Vice President, Accenture	Industry Representative	
Mr. Rajesh Srinivasan, Vice President, CGI India	Expert for Special Courses	
Mrs. Vivekitha Sagi, Lead Quality Engineer, Persistent Systems	College Alumni	

Dr. Durga Krishna Behera
HoD-CSE (AI&ML)

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
Madhurawada :: Visakhapatnam – 530 048

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Minutes of 2nd meeting of the Board of Studies in Electrical and Electronics Engineering Department held on 10th & 11th April 2025 (Thursday & Friday) from 10:00AM to 04:00PM in hybrid mode

The meeting of the Board of Studies in Electrical and Electronics Engineering Department of Gayatri Vidya Parishad College of Engineering for Women is held on 10th & 11th April 2025 (Thursday & Friday) from 10:00AM to 04:00PM to finalize the course structure and syllabi of the 2nd, 3rd & 4th year (1st semester and 2nd semester) courses of B. Tech Program under the regulations R – 24 from the academic year 2024-25 onwards.

Members Present:

Dr R V S Lakshmi Kumari - Chairperson

External Members:

1	Dr K Srikumar, Professor, Dept of EEE JNTU-GV, Vizianagaram	Subject Expert	Offline
2	Dr A Hemachander, Assistant Professor, Dept of EEE NIT-Puducherry, Puducherry	Subject Expert	Offline
3	Dr P Mallikarjuna Rao, Professor & Head of the Dept of Electrical & Electronics Engineering, AU College of Engineering, Visakhapatnam	Vice Chancellor's Nominee	Offline
4	Dr M Santhosh Kumar, System Design Engineer Sensata Technologies, Pune	Industry Representative	Online
5	Ms Ch Vijayalakshmi, Junior Electrical Engineer ACUTRONIC India Pvt Ltd Hyderabad	College Alumni	Offline
6	Ms I Kavya, Associate Senior Electrical Engineer Burnsand Mc Donnells India Pvt Ltd Bangalore	Expert for Special Courses	Offline

Internal Members:

1	Dr ASV Vijaya Lakshmi	Assistant Professor	Offline
2	Dr M Krishna	Assistant Professor	Offline
3	Mrs V Sree Vidhya	Assistant Professor	Offline
4	Mr Y Ramu	Assistant Professor	Offline
5	Mr D Srinivas Reddy	Assistant Professor	Offline
6	Ms P Sai Jyothi	Assistant Professor	Offline
7	Mrs B Kusuma Kumari	Assistant Professor	Offline
8	Mr A Srinivasa Rao	Assistant Professor	Offline

The meeting commenced with the Principal & Chairman, Academic Council, welcoming the members of Board of Studies of different departments and requested to frame the syllabus in accordance with the guidelines of NEP-2020 and the industry standards.

Following this, the Principal informed the members about the amendment made to the Academic Rules and Regulations (R-24) for B.Tech Programs in accordance with AICTE recommendations during the Academic Council meeting held on 26.10.2024.

The amendment pertains to the B. Tech Program regulations at GVPCEW(A), effective from the 2024-25 admitted batch. As per Section 17 (A-ii) of the Academic Rules & Regulations (R-24), the previous requirement for earning a B.Tech Degree with a Minor was to complete 12 credits within the 160-credit framework of the B.Tech program. This condition has now been revised, requiring students to earn 12 additional credits beyond the 160-credit requirement.

The Board of Studies (BoS) meeting of the Department of Electrical and Electronics Engineering commenced with a welcome note from the Chairperson, who also outlined the key resolutions made in the earlier BoS meeting held on 3rd August 2024, which finalized the course structure and syllabi of the 1st year. The Chairperson further requested the Board to deliberate on the course structure and syllabi for the 2nd, 3rd, and 4th years and approve the proposed modifications.

After a detailed and constructive discussion on the revised syllabus for the B.Tech program under R-24 regulations, the Board collectively agreed to implement the proposed courses across various B.Tech program.

The Board unanimously resolved the following:

Item-1: B.Tech EEE Course Structure

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/1

It has been resolved to recommend to the Academic Council for approval of 2nd, 3rd & 4th year B.Tech EEE program as outlined in Annexure-I. The courses are to be offered for B.Tech Program from the 2024 admitted batch onwards.

Item-2: Approval of syllabus of II, III & IV B.Tech EEE Program

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/2

It is resolved to recommend to the Academic Council that the following courses offered for B.Tech EEE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Electrical Circuits 2" offered to the EEE branch in the II year I Semester – Annexure-II
2. The proposed syllabus for the course titled "Electrical Machines 1" offered to the EEE branch in the II year I Semester – Annexure-III
3. The proposed syllabus for the course titled "Electrical Circuits Lab" offered to the EEE branch in the II year I Semester – Annexure-IV
4. The proposed syllabus for the course titled "Design of Electrical Circuits Using Engineering Software" offered to the EEE branch in the II year I Semester – Annexure-V
5. The proposed syllabus for the course titled "Electrical Machines 2" offered to the EEE branch in the II year II Semester – Annexure-VI
6. The proposed syllabus for the course titled "Electrical Measurements" offered to the EEE branch in the II year II Semester – Annexure-VII
7. The proposed syllabus for the course titled "EMF Theory" offered to the EEE branch in the II year II Semester – Annexure-VIII
8. The proposed syllabus for the course titled "Power Systems 1" offered to the EEE branch in the II year II Semester – Annexure-IX
9. The proposed syllabus for the course titled "Electrical Machines 1 Lab" offered to the EEE branch in the II year II Semester – Annexure-X
10. The proposed syllabus for the course titled "Electrical Measurements Lab" offered to the EEE branch in the II year II Semester – Annexure-XI
11. The proposed syllabus for the course titled "Electrical CAD" offered to the EEE branch in the II year II Semester – Annexure-XII
12. The proposed syllabus for the course titled "Control Systems" offered to the EEE branch in the III year I Semester – Annexure-XIII
13. The proposed syllabus for the course titled "Power Electronics" offered to the EEE branch in the III year I Semester – Annexure-XIV
14. The proposed syllabus for the course titled "Power systems 2" offered to the EEE branch in the III year I Semester – Annexure-XV
15. The proposed syllabus for the course titled "Control Systems Lab" offered to the EEE branch in the III year I Semester – Annexure-XVI
16. The proposed syllabus for the course titled "Electrical Machines 2 Lab" offered to the EEE branch in the III year I Semester – Annexure-XVII
17. The proposed syllabus for the course titled "Electric Drives" offered to the EEE branch in the III year II Semester – Annexure-XVIII

18. The proposed syllabus for the course titled "Power System Analysis and Stability" offered to the EEE branch in the III year II Semester – Annexure-XIX
19. The proposed syllabus for the course titled "Power Electronics Lab" offered to the EEE branch in the III year II Semester – Annexure-XX
20. The proposed syllabus for the course titled "Power Systems Simulation Lab" offered to the EEE branch in the III year II Semester – Annexure-XXI
21. The proposed syllabus for the course titled "Fundamentals of PLC Programming" offered to the EEE branch in the III year II Semester – Annexure-XXII
22. The proposed syllabus for the course titled "IOT and its Applications" offered to the EEE branch in the IV year I Semester – Annexure-XXIII

Item-3: Approval of syllabus of Professional Elective courses

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/3

It is resolved to recommend to the Academic Council that the following Program Elective courses offered for B.Tech EEE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Artificial Intelligence Applications in Power Systems" offered to the EEE branch students – Annexure-XXIV
2. The proposed syllabus for the course titled "Digital Control Systems" offered to the EEE branch students – Annexure- XXV
3. The proposed syllabus for the course titled "Electrical Distribution Systems" offered to the EEE branch students – Annexure- XXVI
4. The proposed syllabus for the course titled "Electrical Energy Audit and Management" offered to the EEE branch students – Annexure- XXVII
5. The proposed syllabus for the course titled "Flexible AC Transmission Systems" offered to the EEE branch students – Annexure- XXVIII
6. The proposed syllabus for the course titled "HVDC Transmission" offered to the EEE branch students – Annexure- XXIX.
7. The proposed syllabus for the course titled "Hybrid Electric Vehicles" offered to the EEE branch students – Annexure-XXX
8. The proposed syllabus for the course titled "Machine Learning Applications in Electrical Engineering" offered to the EEE branch students – Annexure- XXXI
9. The proposed syllabus for the course titled "Power System Operation and Control" offered to the EEE branch students – Annexure- XXXII
10. The proposed syllabus for the course titled "Power System Protection" offered to the EEE branch students – Annexure- XXXIII
11. The proposed syllabus for the course titled "Renewable Energy Sources" offered to the EEE branch students – Annexure- XXXIV

12. The proposed syllabus for the course titled "Smart Grids" offered to the ECE branch in the II year I Semester – Annexure- XXXV
13. The proposed syllabus for the course titled "Special Electrical Machines" offered to the EEE branch students – Annexure-XXXVI
14. The proposed syllabus for the course titled "Utilization of Electrical Energy" offered to the EEE branch students – Annexure-XXXVII

Item-4: Approval of syllabus of Open Elective courses to Other Departments offered by EEE

Resolution No: GVPCEW(A)/BOS-2/EEE/2024/4

It is resolved to recommend to the Academic Council that the following Open Elective courses and other department courses offered by EEE Program to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Basics of Electrical Wiring" offered as open elective by the Department of EEE to other Departments – Annexure- XXXVIII
2. The proposed syllabus for the course titled "Fundamentals of Power Electronics" offered as open elective by the Department of EEE to other Departments – Annexure- XXXIX
3. The proposed syllabus for the course titled "Fundamentals of Utilization Of Electrical Energy" offered as open elective by the Department of EEE to other Departments – Annexure- XL
4. The proposed syllabus for the course titled "Linear Control Systems" offered as open elective by the Department of EEE to other Departments – Annexure- XLI
5. The proposed syllabus for the course titled "Sustainable Energy Sources" offered as open elective by the Department of EEE to other Departments – Annexure- XLII

Item-5: Approval of the subjects & syllabus related to Minor program in EEE

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/5

It is resolved to recommend to the Academic Council that the following courses offered for Minor Program in EEE to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Basics of Smart Grids" offered as Minor course in EEE – Annexure- XLIII
2. The proposed syllabus for the course titled "Concepts of Power System Engineering" offered as Minor course in EEE – Annexure- XLIV
3. The proposed syllabus for the course titled "Electrical Vehicle Technology" offered as Minor course in EEE – Annexure- XLV
4. The proposed syllabus for the course titled "Energy Conservation, Audit and Management" offered as Minor course in EEE – Annexure- XLVI

Item-6: Approval of the subjects & syllabus related to Honors program in EEE

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/6

It is resolved to recommend to the Academic Council that the following courses offered for Honors Program in EEE to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Electrical Vehicle Motor Drives" offered as Honors course in EEE – Annexure- XLVII
2. The proposed syllabus for the course titled "Energy Management Strategies and Communication Protocols for EV/HEV" offered as Honors course in EEE – Annexure- XLVIII
3. The proposed syllabus for the course titled "Energy Storage Systems" offered as Honors course in EEE – Annexure- XLIX
4. The proposed syllabus for the course titled "EV Charging Technologies" offered as Honors course in EEE – Annexure- L
5. The proposed syllabus for the course titled "Switched Mode Power Conversion" offered as Honors course in EEE – Annexure- LI
6. The proposed syllabus for the course titled "Evolutionary Algorithms Applications in Power Engineering" offered as Honors course in EEE – Annexure- LII
7. The proposed syllabus for the course titled "Power Converters for Microgrid" offered as Honors course in EEE – Annexure- LIII
8. The proposed syllabus for the course titled "Power Quality" offered as Honors course in EEE – Annexure- LIV
9. The proposed syllabus for the course titled "Power Systems Reliability" offered as Honors course in EEE – Annexure- LV
10. The proposed syllabus for the course titled "Restructured Power Systems" offered as Honors course in EEE – Annexure- LVI

Item-7: Approval of syllabus of Mandatory course

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/7

It is resolved to recommend to the Academic Council that the following course offered for B.Tech Program in EEE to be effective from 2024 admitted batch onwards for approval.

1. The proposed syllabus for the course titled "Design Thinking & Innovation" offered as Mandatory course in EEE – Annexure- LVII

Resolution No: GVPCEW(A)/BOS-2/EEE/2025/8

The Board Members unanimously authorize the Chairperson to make minor modifications in the title/content of a course if necessary.

The meeting concluded by thanking all the members.

Members Present:

Name of the Member	Designation	Signature
Dr R V S Lakshmi Kumari	Chairperson, BoS and Head, Dept of EEE	
Dr ASV Vijaya Lakshmi	Assistant Professor	
Dr M Krishna	Assistant Professor	
Mrs V Sree Vidhya	Assistant Professor	
Mr Y Ramu	Assistant Professor	
Mr D Srinivas Reddy	Assistant Professor	
Ms P Sai Jyothi	Assistant Professor	
Mrs B Kusuma Kumari	Assistant Professor	
Mr A Srinivasa Rao	Assistant Professor	
Dr K Srikumar	Subject Expert	
Dr A Hemachander	Subject Expert	
Dr P Mallikarjuna Rao	Vice Chancellor's Nominee	
Dr M Santhosh Kumar	Industry Representative	
Ms Ch Vijayalakshmi	College Alumni	
Ms I Kavya	Expert for Special Courses	

Chairperson, BoS

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ANNEXURE – LXII

M.Tech -VLSI DESIGN & EMBEDDED SYSTEMS

Course Structure and Scheme of Valuation w.e.f. 2024-25 admitted batch

III SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
	Elective-V	3	-	70	30	100	3
	Open Elective	3	-	70	30	100	3
24EC21PR02	Dissertation-I/ Industrial Project	-	-	-	100	100	10
	Total	**6**	**-**	**140**	**160**	**300**	**16**

Elective V: Memory Technologies/ Programming Languages for Embedded Software/ Universal Verification Methodologies

Open Elective: Business Analytics/ Cost Management of Engineering Projects/ Optimization Techniques

IV SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24EC21PR03	Dissertation-II	-	-	100	-	100	16
	Total	**-**	**-**	**100**	**-**	**100**	**16**

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ANNEXURE – LXIII

Elective V
MEMORY TECHNOLOGIES
II Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

COURSE CODE: 24EC21PE5A

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand the basic structure, working, and types of SRAM used in digital systems.
CO2:	Explain the design, operation, and reliability aspects of Dynamic RAM (DRAM) technologies.
CO3:	Identify key non-volatile memories and their storage techniques.
CO4:	Outline memory reliability issues and radiation effects with protection methods.
CO5:	Summarize features and functions of FRAM, MRAM, and analog memories.

UNIT-I
Static RAM Technologies: Static Random-Access Memories (SRAMs), SRAM Cell Structures, MOSSRAM Architecture, MOS SRAM Cell and Peripheral Circuit, Bipolar SRAM, Advanced SRAM Architectures, Application Specific SRAMs.

UNIT-II
Dynamic RAM Technologies: DRAMs, MOSDRAM Cell, Bi-CMOSDRAM, Error Failures in DRAM, Advanced DRAM Design and Architecture, Application Specific DRAMs. SRAM and DRAM Memory controllers.

UNIT-III
Non-Volatile Memories: Masked ROMs, PROMs, Bipolar &CMOS PROM, EEPROMs, Floating Gate EPROM Cell, OTP EPROM, EEPROMs, Non-volatile SRAM, Flash Memories.

UNIT-IV
Memory Reliability and Radiation Effects: General Reliability issues, RAM Failure Modes and Mechanism, Nonvolatile Memory, Radiation Effects, SEP, Radiation Hardening Techniques. Process and Design issues, Radiation Hardened Memory Characteristics, Radiation Hardness Assurance and Testing.

UNIT-V
Advanced Memory Technologies: Introduction to memory technologies, High-density Memory Packing Technologies, Ferroelectric Random Access Memories (FRAMs), Gallium Arsenide (GaAs) FRAMs, Analog Memories, Magneto Resistive Random Access Memories (MRAMs), Experimental Memory Devices.

Text Books:
1. Advance Semiconductor Memories: "Architectures, Designs and Applications", Ashok K Sharma, Wiley, 2002.
Reference Books:
1. VLSI memory chip design, Kiyoo Itoh, Springer International Edition, 2001. 2. Semiconductor Memories: Technology, Testing and Reliability, Ashok K Sharma, PHI, 2002.

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ANNEXURE – LXIV

Elective V
PROGRAMMING LANGUAGES FOR EMBEDDED SOFTWARE
II Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

COURSE CODE: 24EC21PE5B

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Outline the use of embedded C and interfaces for controlling hardware in embedded systems.
CO2:	Compare Object-Oriented Programming with traditional programming methods.
CO3:	Explain dynamic memory use and code structuring with classes in C++.
CO4:	Identify operator overloading and inheritance types, and explain polymorphism in C++.
CO5:	Summarize templates and exception handling in C++ and basics of PERL scripting.

UNIT-I

Embedded Peripherals: Embedded 'C' Programming, Bitwise operations, Dynamic memory allocation, OS services, Linked stack and queue, Sparse matrices, Binary tree, Interrupt handling in C, Code Optimization issues, Writing LED drivers, Drivers for serial port communication, Embedded Software Development and Cycle and Methods (Waterfall, Agile).

UNIT-II

OOPs Programming techniques: Introduction to procedural, Modular, Object-Oriented and Generic Programming techniques, Limitations of procedural programming, Objects, Classes, Data members, Methods, Data Encapsulation, Data abstraction and information hiding, Inheritance, Polymorphism.

UNIT-III

Memory allocation techniques: CPP Programming: 'cin', 'cout', Formatting and I/O manipulators, New and delete Operators, Defining a class, Data members and methods, 'this' pointer, Constructors, Destructors, Friend
function, Dynamic memory allocation.

UNIT-IV

Overloading and Inheritance: Need of operator overloading, overloading the assignment, Overloading using friends, Type Conversions, single inheritance, base and derived classes, friend classes, types of Inheritance, hybrid inheritance, multiple inheritance, virtual base class, polymorphism, Virtual functions.

UNIT-V

Templates: Function template and class template, member function templates and template arguments, Multiple Exceptions, Scripting Languages, PERL: Operators, Statements Pattern Matching.

Text Books:

1. Embedded C, Pearson Education, Michael J. Pont, 2nd Edition, 2008.
2. Data structures via C++, Michael Berman, Oxford University Press, 2002.
3. Learning Perl, Randal L. Schwartz, O'Reilly Publications, 6th Edition 2011.

Reference Books:

1. Algorithms in C++, Robert Sedgewick, Addison Wesley Publishing Company,1999.
2. Operating System Concepts, Abraham Silberscatz, Peter B, Greg Gange, John Willey&Sons, 2005.

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ANNEXURE - LXV

Elective V
UNIVERSAL VERIFICATION METHODOLOGIES
II Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

COURSE CODE: 24EC21PE5C

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand the basic classes, Structure and Configurations of UVM
CO2:	Make use of UVM sequence items, Ports, Component communication for UVM Sequence generation and Arbitration
CO3:	Build UVM Stimulus using Driver components, Sequencer components, Monitor components and predictor components
CO4:	Develop UVM verification based on Score board components, Checker components
CO5:	Model UVM test suites, Call backs and environment deployment and integration

UNIT-I

Introduction to UVM: Verification challenges, Limitations of traditional verification methods, UVM architecture, Classes, UVM test bench structure and configuration, UVM components (environment, agent, driver, monitor, etc.), Connecting and coordinating UVM components

UNIT-II

UVM Transactions and Sequences: UVM Transaction Classes and Their Usage-Defining transaction data and their properties, Randomizing transaction data and constraints, Packing and unpacking transaction data.

UVM Sequence Items and Sequences- Sequence item classes and their usage, defining sequence logic and flow control, generating stimulus using sequences.

UVM Ports, Exports, and Component Communication-UVM ports, UVM exports and their usage, Connecting UVM components using ports and exports, UVM Sequence Generation and Arbitration

UNIT-III

UVM Stimulus Generation and Monitoring:

UVM Driver Components and Their Responsibilities- Interfacing with the design under test (DUT), Applying stimulus and monitoring responses, Coordinating with sequencers for stimulus generation, UVM Sequencer Components and Their Usage- Sequencer responsibilities and functionality, Handling complex monitoring scenarios, UVM Predictor Components and Their Usage.

UNIT-IV

UVM Verification Components and Mechanisms : UVM Scoreboard Components and Their Usage: Scoreboard structure and responsibilities, comparing actual and expected design behavior, Handling complex scoreboard scenarios

UVM Checker Components and Their Functionality**,**UVM Factory and Object Creation Mechanism- UVM factory structure and usage: Overriding component and object creation, Customizing UVM components using the factory. UVM Reporting, Logging, and Error Handling

UNIT-V

UVM Test Automation and Deployment : UVM Test and Test Suite Structure: Defining UVM test components and their responsibilities, Organizing and executing UVM test suites, Interpreting UVM test results and coverage. UVM Phasing Mechanism and Run-Time Hooks- UVM phasing structure and execution order, Synchronizing UVM components using phases, Utilizing run-time hooks for custom functionality, UVM Callbacks and User-Defined Components**,**
UVM Verification Planning, Regression, and Debug

Text Books:

1. UVM Primer: A Practical Guide to Using the Universal Verification Methodology by Janick Bergeron and Marc Poulter

Reference Books:

1. System Verilog Testbench Methodology Guide by Janick Bergeron and Chris Spear
2. UVM Cookbook by David L. Barr
3. UVM Verification Methodology: A Practical Guide by Alain Michel
4. UVM Verification: A Practical Guide by Janick Bergeron and Chris Spear

GVP COLLEGE OF ENGINEERING FOR WOMEN
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

M. Tech -Computer Science and Engineering (Data Science)

Course Structure w.e.f. 2024-25

I SEMESTER

Code	Name of the subject	Periods/week		Max.Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24CS21RC01	Introduction to Data Science	3	-	70	30	100	3
24CS21RC02	Cloud Computing and Virtualization	3	-	70	30	100	3
24CS21PE01	Elective-I	3	-	70	30	100	3
24CS21PE02	Elective-II	3	-	70	30	100	3
24HM21RC01	Research Methodology &IPR	2	-	70	30	100	2
24HM21AC02	Organizational Behavior (Audit Course)	3	-	70	30	100	0
24CS21RC03	Data Science Applications with Python Lab		3	50	50	100	1.5
24CS21RC04	Cloud Computing and Big Data Analytics Lab		3	50	50	100	1.5
	Total	**18**	**6**	**520**	**280**	**800**	**17**

Elective-I: Big Data Analytics, Computational Linear Algebra, Soft Computing, Computational Biology, Internet of Things

Elective II: Cyber Security for Data Science, Optimization Techniques for Data Science, Time Series data Analysis, Natural Language Processing, Statistical Modeling

II SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24CS21RC05	Machine Learning	3	-	70	30	100	3
24CS21RC06	Data Visualization	3	-	70	30	100	3
24CS21PE03	Elective-III	3	-	70	30	100	3
24CS21PE04	Elective-IV	3	-	70	30	100	3
24HM21AC03	Entrepreneurship (Audit Course)	3	-	70	30	100	0
24CS21RC07	Machine Learning Lab	-	3	50	50	100	1.5
24CS21RC08	Data visualization using Tableau Lab	-	3	50	50	100	1.5
24CS21PR01	Mini Project with Seminar	-	4	-	100	100	2
	Total	**15**	**9**	**450**	**350**	**800**	**17**

Elective III: Image and Video Analytics, Social Media Analytics, Deep Learning, Business Analytics, High Performance Computing

Elective IV: Geographic Information System, Block Chain Technology, Secure Software Design, Data Storage Technologies and Networks, Information Retrieval Systems

Annexure-IX

Introduction to Data science

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to Data Science Applications-Overview of data science and its significance in different domains, Examples of successful data science applications, Ethical considerations in data science, Data Cleaning and Preprocessing, Data quality assessment and improvement techniques, Handling missing data and outliers, Data transformation and feature engineering, Exploratory Data Analysis, Statistical analysis and data visualization, Identifying patterns, correlations, and trends in data, Feature selection techniques.

UNIT II: Applications of Data Science- Data Science Applications in Healthcare, Data Science Applications in Education, Data Science Applications in Manufacturing and Production, Data Science Applications in Sports, Data Science Applications in Cyber-Security, Data Science Applications in Airlines

UNIT III: Widely Used Techniques in Data Science Applications: Supervised Learning, Unsupervised Learning Reinforcement Learning, A/B Testing, Association Rules, Decision Tree, Cluster Analysis, Advantages and Disadvantages of Clustering, Pattern Recognition

UNIT IV: Data Preprocessing: Feature, Feature Selection, Feature Selection Methods, Objective of Feature Selection, Feature Selection Criteria, Feature Generation Schemes, Applications of Feature Selection, Feature Selection: Issues, Different Types of Feature Selection Algorithms. Classification: Classification, Decision Tree, Regression Analysis, Support Vector Machines, Naive Bayes, Artificial Neural Networks

UNIT V: Clustering: Cluster Analysis, Types of Clusters, K-Means, Reducing the SSE with Post-processing ,Bisecting K-Means, Agglomerative Hierarchical Clustering, DBSCAN Clustering Algorithm, Cluster Evaluation, General Characteristics of Clustering Algorithms Usman Qamar, Muhammad Summair Raza

UNIT VI: Text Mining: Text Mining Applications, Exploratory Text Analysis, Information Extraction , Automatic Text Classification, Text Categorization Types, Text Categorization Approaches, Perspectives for Text Categorization ,Text Categorization Applications, Representation of Document, Text Document Preprocessing , Opinion Mining, Sentiment Classification.

UNIT VII: Data Visualization: Principles of effective data visualization, Visualizing relationships, distributions, and trends, Interactive and dynamic visualizations, Applications of Data Science in Business Analytics. Role of Data Science in Revolutionizing Healthcare , BERT- and Fast Text-Based Research Paper Recommender System

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Text Books:

1. "Data Science for Applications: Concepts, Techniques, and Practical Examples", John Smith, Publisher: DataTech Publishing, ISBN: 978-1234567890.

Reference Books:

1. Data Science Techniques and Intelligent Applications, Chapman & Hall/CRC, 2022, Pallavi Vijay Chavan, Parikshit N. Mahalle, Ramchandra Mangrulkar, Idongesit Williams

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Cloud Computing and Virtualization

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to Cloud: The vision of cloud computing, Defining a cloud, The cloud computing reference model, Characteristics and benefits, Challenges, Principles of Parallel and Distributed Computing, Virtualization: Characteristics and Taxonomy of Virtualization Techniques, Virtualization and cloud computing, Cloud Computing Architecture.

UNIT II: Virtual Machines and Virtualization of Clusters and Data Centres: Implementation Levels of Virtualization, Virtualization Structures/Tools and Mechanisms, Virtualization of CPU, Memory, and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data-Centre Automation.

UNIT III: Service-Oriented Architectures for Distributed Computing: Services and Service-Oriented Architecture, Message-Oriented Middleware, Workflow in Service-Oriented Architectures.

UNIT IV: Cloud Programming and Software Environments: Parallel and Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments

UNIT V: Grid Computing Systems and Resource Management: Grid Architecture and Service Modelling, Grid Projects and Grid Systems Built, Grid Resource Management and Brokering, Software and Middleware for Grid Computing, Grid Application Trends and Security Measures

UNIT VI: Peer-to-Peer Computing and Overlay Networks: Peer-to-Peer Computing Systems, P2P Overlay Networks and Properties, Routing, Proximity, and Fault Tolerance, Trust, Reputation, and Security Management, P2P File Sharing and Copyright Protection.

UNIT VII: Ubiquitous Clouds and the Internet of Things: Cloud Trends in Supporting Ubiquitous Computing, Performance of Distributed Systems and the Cloud, Enabling Technologies for the Internet of Things, Innovative Applications of the Internet of Things, Online Social and Professional Networking.

Text Books:

1. Kai Hwang, Geoffrey C. Fox and Jack J. Dongarra, "Distributed and cloud computing from Parallel Processing to the Internet of Things", Morgan Kaufmann, Elsevier, 2012.

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Reference Books:

1. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, "Mastering Cloud Computing", Tata Mcgraw Hill, 2013.
2. Cloud Computing:Theory and Practice, Dan C. Marinescu, Morgan Kaufmann, Elsevier, 2012
3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing – A Practical Approach, Tata Mcgraw Hill, 2009
4. Barrie Sosinsky, "Cloud Computing Bible" John Wiley & Sons, 2010.

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Elective-I Big Data Analytics

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to big data: What is big data, why big data, convergence of key trends, unstructured data, industry examples of big data, web analytics, big data and marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, big data and healthcare, big data in medicine, advertising and big data, big data technologies, introduction to Hadoop, open source technologies, cloud and big data,

UNIT II: Introduction to NoSQL, aggregate data models, aggregates, key-value and document data models, relationships, graph databases, schema less databases, materialized views, distribution models, sharding, master-slave replication, peer- peer replication, sharding and replication, consistency, relaxing consistency, version stamps, Working with Cassandra ,Table creation, loading and reading data

UNIT III: Hadoop and Mapreduce: Data formats, analyzing data with Hadoop, scaling out, Architecture of Hadoop distributed file system (HDFS), fault tolerance ,with data replication, High availability, Data locality , Map Reduce Architecture, Process flow, Java interface, data flow, Hadoop I/O, data integrity, compression, serialization

UNIT IV: Introduction to Hive, data types and file formats, HiveQL data definition, HiveQL data manipulation, Logical joins, Window functions, Optimization, Table partitioning, Bucketing, Indexing, Join strategies

UNIT V: Apache spark- Advantages over Hadoop, lazy evaluation, In memory processing, DAG, Spark context, Spark Session, RDD, Transformations- Narrow and Wide, Actions, Data frames ,RDD to Data frames, Catalyst optimizer, Data Frame Transformations, Working with Dates and Timestamps, Working with Nulls in Data, Working with Complex Types, Working with JSON, Grouping,

UNIT VI: Apache spark :Window Functions, Joins, Data Sources, Broadcast Variables, Accumulators, Deploying Spark- On-Premises Cluster Deployments, Cluster Managers-Standalone Mode, Spark on YARN , Spark Logs, The Spark UI- Spark UI History Server, Debugging and Spark First Aid

UNIT VII: Apache spark tuning: Spark-Performance Tuning, Stream Processing Fundamentals, Event-Time and State full Processing - Event Time, State full Processing, Windows on Event Time- Tumbling Windows, Handling Late Data with Watermarks, Dropping Duplicates in a Stream, Structured Streaming Basics - Core Concepts, Structured Streaming in

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Action, Transformations on Streams, Input and Output

Text Books:

1. Big Data, Big Analytics: Emerging, Michael Minnelli, Michelle Chambers, and Ambiga Dhiraj.

Reference Books:

1. SPARK: The Definitive Guide, Bill Chambers & Matei Zaharia, O'Reilley, 2018 Edition
2. Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013
3. P. J. Sadalage and M. Fowler, "NoSQL Distilled: A Brief Guide to the Emerging World Polyglot Persistence", Addison-Wesley Professional, 2012
4. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley, 2012
5. "Hadoop Operations", O'Reilley, Eric Sammer, 2012
6. "Programming Hive", O'Reilley, E. Capriolo, D. Wampler, and J. Rutherglen, 2012
7. "HBase: The Definitive Guide", O'Reilley, Lars George, 2011
8. "Cassandra: The Definitive Guide", O'Reilley, Eben Hewitt, 2010
9. "Programming Pig", O'Reilley, Alan Gates, 201

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Elective-I Computational Linear Algebra

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Basic Linear Algebra Subprograms: BLAS: An Introductory Example, Matrix Notations, IEEE Floating Point Systems and Computer Arithmetic, Vector-Vector Operations: Level-1 BLAS, Matrix-Vector Operations: Level-2, BLAS Matrix-Matrix Operations: Level-3 BLAS, Sparse Matrices: Storage and Associated Operations..

UNIT II: Basic Concepts for Matrix Computations: Vector Norms, Complements on Square Matrices, Rectangular Matrices: Ranks and Singular Values, Matrix Norms.

UNIT III: Gauss Elimination and LU Decompositions of Matrices : Special Matrices for LU Decomposition, Gauss Transforms, Naive LU Decomposition for a Square Matrix with Principal Minor Property (pmp), Gauss Reduction with Partial Pivoting: PLU Decompositions, MATLAB Commands Related to the LU Decomposition, Condition Number of a Square Matrix.

UNIT IV: Orthogonal Factorizations and Linear Least Squares Problems : Formulation of Least Squares Problems: Regression Analysis, Existence of Solutions Using Quadratic Forms, Existence of Solutions through Matrix Pseudo-Inverse, The QR Factorization Theorem, Gram-Schmidt Orthogonalization: Classical, Modified, and Block Solving, the Least Squares Problem with the QR Decomposition, Householder QR with Column Pivoting, MATLAB Implementations

UNIT V: Algorithms for the Eigenvalue Problem : Basic Principles, QR Method for a Non-Symmetric Matrix, Algorithms for Symmetric Matrices, Methods for Large Size Matrices, Singular Value Decomposition.

UNIT VI: Iterative Methods for Systems of Linear Equations : Stationary Methods, Krylov Methods, Method of Steepest Descent for spd Matrices, Conjugate Gradient Method (CG) for spd Matrices, The Generalized Minimal Residual Method, The Bi-Conjugate Gradient Method, Preconditioning Issues.

UNIT VII: Sparse Systems to Solve Poisson Differential Equations : Poisson Differential Equations, The Path to Poisson Solvers, Finite Differences for Poisson-Dirichlet Problems, Variational Formulations, One-Dimensional Finite-Element Discretizations.

Text Books:

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1. INTRODUCTION TO COMPUTATIONAL LINEAR ALGEBRA by Nabil Nassif, Jocelyne Erhel, Bernard Philippe. CRC Press, Taylor & Francis Group, 6000 Broken Sound Parkway NW, Suite 300 Boca Raton, FL 33487-2742, 2016.

Reference Books:

1. Gilbert Strang, Linear Algebra and its Applications, Fourth Edition, Cambridge University Press. 2009.
2. Gene H. Golub and V. Van Loan, Matrix Computations, Third Edition, John Hopkins University Press, Baltimore, 1996.
3. David C. Lay, Linear Algebra and Its Applications, Pearson Addison Wesley, 2002.
4. Strang, Gilbert. Linear algebra and learning from data. Cambridge: Wellesley-Cambridge Press, 2019.

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Elective-I **Soft Computing**

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction: What is Soft Computing? ,Fuzzy Systems,Rough Sets, Artificial Neural Networks, Evolutionary Search Strategies,
FUZZY SETS: Crisp Sets, Fuzzy Sets, Fuzzy Membership Functions, Operations on Fuzzy Sets, Fuzzy Relations, Fuzzy Extension Principle.

UNIT II: Fuzzy Logic: Crisp Logic, Fuzzy Logic Basics, Fuzzy Truth in Terms of Fuzzy Sets, Fuzzy Rules, Fuzzy Reasoning,

UNIT III: Fuzzy Inference Systems: Introduction, Fuzzification of the Input Variables, Application of Fuzzy Operators on the Antecedent Parts of the Rules, Evaluation of the Fuzzy Rules, Aggregation of Output Fuzzy Sets Across the Rules, Defuzzification of the Resultant Aggregate Fuzzy Set, Fuzzy Controllers.

UNIT IV: Rough Sets: Information Systems and Decision Systems, Indiscernibility, Set Approximations, Properties of Rough Sets.

UNIT V: Neural Networks: Machine Learning Using Neural Network, Adaptive Networks, Feed forward Networks, Supervised Learning Neural Networks, Radial Basis Function Networks: Reinforcement Learning, Unsupervised Learning Neural Networks, Adaptive Resonance architectures

UNIT VI: Basics of Genetic Algorithms: Introduction to Genetic Algorithms (GA), Applications of GA in Machine Learning: Machine Learning Approach to Knowledge Acquisition.

UNIT VII: Deep Networks : Introduction to Deep learning – Deep neural networks – concepts. Recurrent neural network - concepts – applications.

Text Books:

1. Samir Roy, Udit Chakraborty, Introduction to Soft Computing: Neuro-Fuzzy and Genetic Algorithms, Pearson, 2013

Reference Books:

1. Jyh-Shing Roger Jang, Chuen:Tsai Sun, EijiMizutani, Neuro:Fuzzy and Soft Computing®,Prentice Hall of India, 2003

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2. Saroj Kaushik, Sunita Tiwari, Soft computing: Fundamentals, Techniques and applications,Mc Graw Hill Education, 2018
3. Sivanandam&Deepa, "Principles of Soft Computing", 2nd Edition, Wiley India, 2011
4. Snehashish Chakraverty, Deepti Moyi Sahoo, Nisha Rani Mahato,Concepts of Soft Computing: Fuzzy and ANN with Programming, Springer,2019.
5. Samir Roy, Udit Chakraborty, Introduction to Soft Computing: Neuro-Fuzzy and Genetic Algorithms, Pearson, 2013.
6. D. E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", 1st Edn, Pearson, 2016

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Elective-I Computational Biology

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: DNA computing: Motivation- DNA structure- processing and computational operations- steps involved in DNA computation- Filtering models: Adleman's experiment-Lipton's solution-Scope and Applications of DNA computing- Search Algorithms: Hill climbing, Simulated annealing:-introduction-Simulated annealing algorithm.

UNIT II: Combinatorial Pattern Matching: Hash Tables, Repeat Finding, Exact Pattern Matching; Genetic Algorithm: Basic Concepts, Reproduction, Cross over, Mutation, Fitness Value, Optimization using GAs; Applications of GA in bioinformatics.

UNIT III: Hidden Markov Model: Markov processes and Markov Models, Hidden Markov Models. Forward and Backward Algorithms, Most probable state path: Viterbi algorithm, Parameter Estimation for HMMs:-Baum-Welch Algorithm, Applications of profile HMMs for multiple alignment of proteins and for finding genes in the DNA

UNIT IV: Designing Effective Visualizations: -Steps in Designing Visualizations,- Problems in Designing Effective Visualizations.- Comparing and Evaluating Visualization Techniques-User Tasks- User Characteristics Data Characteristics -Visualization Characteristics-,Structures for Evaluating Visualizations Benchmarking Procedures-,An Example of Visualization Benchmarking

UNIT V: Support Vector Machines: Introduction- hyperplane separation (maximum and soft margin hyperplanes)-linear classifier-Kernel functions, Large Margin Classification, Optimization problem with SVM- Applications of SVM in bioinformatics

UNIT VI: Bayesian network: Bayes Theorem-Inference and learning of Bayesian network- BN and Other Probabilistic Models

UNIT VII: Artificial Neural Network: Historic evolution – Perceptron, characteristics of neural networks terminology, models of neuron Mc Culloch – Pitts model, Perceptron, Adaline model, Basic learning laws, Topology of neural network architecture, single layer ANN, multilayer perceptron, back propagation learning, input - hidden and output layer computation, back propagation algorithm, Applications of ANN.

Text Books:

1. An introduction to bioinformatics algorithms by Neil C. Jones, Pavel Pevzner. MIT Press.2004.

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Reference Books:

1. Biological sequence analysis: Probabilistic models of proteins and nucleic acids by Richard Durbin, Eddy, Anders Krogh, 1998
2. Algorithms for Molecular Biology by Ron Shamir Lecture, Fall Semester, 2001
3. Neural Networks: A Systematic Introduction by Raul Rojas. Springer. 1996
4. Artificial Intelligence and Games by Georgios N. Yannakakis and Julian Togelius, Springer 2018
5. Bioinformatics: the machine learning approach by Pierre Baldi, Søren Brunak. MIT Press.2001.
6. Bioinformatics: Sequence and Genome Analysis: by David Mount, University of Arizona,Tucson. 2005
7. Fundamentals of natural computing : Basic concepts, Algorithms and Applications, Chapman & Hall / CRC, Taylor & Francis group, 2006

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Elective-I Internet of Things

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Fundamentals of IoT: Evolution of Internet of Things, Enabling Technologies, IoT Architectures: oneM2M, IoT World Forum (IoTWF) and Alternative IoT models, Simplified IoT Architecture and Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects

UNIT II: IoT Protocols: IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah and LoRaWAN, Zigbee protocol, Network Layer: IP versions, Constrained Nodes and Constrained Networks

UNIT III: Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks, Application Transport Methods: Supervisory Control and Data Acquisition, Application Layer Protocols: CoAP and MQTT

UNIT IV: Design and Development: Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks, Arduino–Board details, IDE programming, Raspberry Pi and Interfaces

UNIT V: Data Analytics and Supporting Services: Structured Vs Unstructured Data and Data in Motion Vs Data in Rest, Role of Machine Learning-No SQL Databases, Hadoop Ecosystem, Apache Kafka, Apache Spark, Edge Streaming Analytics and Network Analytics, Xively Cloud for IoT

UNIT VI: Python Web Application Framework, Django, AWS for IoT, System Management with NETCONF-YANG, Kibana, Fault-tolerant data processing on devices.

UNIT VII: Case Studies/Industrial Applications: Cisco IoT system, IBM Watson IoT platform, Manufacturing, Converged Plantwide Ethernet Model (CPwE), Power Utility Industry, GridBlocks Reference Model, Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control

Course outcome: At the end of the course.

Text Books:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, IoT Fundamentals:Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017

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Reference Books:

1. Arshdeep Bahga, Vijay Madisetti, Internet of Things – A hands-on approach, Universities Press, 2015.
2. Olivier Hersent, David Boswarthick, Omar Elloumi , The Internet of Things – Key applications and Protocols, Wiley, 2012
3. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand, DavidBoyle, From Machine-to-Machine to the Internet of Things –Introduction to a New Age of Intelligence, Elsevier, 2014.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), Architecting the Internet of Things, Springer, 2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011

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Elective-II Cyber Security for Data Science

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to Cyber Security-Cyber security objectives, roles, differences between information security and cyber security, Cyber security principles-confidentiality, integrity, availability, authentication and non-repudiation.

UNIT II: Information Security within Lifecycle Management-Lifecycle management landscape, Security architecture processes, Security architecture tools, Intermediate lifecycle management concepts.

UNIT III: Risks & Vulnerabilities-Basics of risk management, Operational threat environments, Classes of attacks.

UNIT IV: Incident Response-Incident categories, Incident response, Incident recovery, **Operational security protection**-Digital and data assets, ports and protocols, Protection technologies, Identity and access Management, configuration management.

UNIT V: Threat Detection and Evaluation Monitoring-Vulnerability management, Security logs and alerts, Monitoring tools and appliances

UNIT VI: Analysis-Network traffic analysis, packet capture and analysis.

UNIT VII: Data Visualization: Introduction to backdoor System and security-Introduction to metasploit, backdoor, demilitarized zone (DMZ), Digital signature, Brief study on Harding of operating system.

Text Books:

1. NASSCOM: Security Analyst Student Hand Book, Dec 2015

Reference Books:

1. Information Security Management Principles, Updated Edition, David Alexander, Amanda Finch, David Sutton, BCS publishers, June 2013.
2. Cyber Security Fundamentals-Cyber Security, Network Security and Data Governance Security, 2nd Edition, ISACA Publishers

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Elective-II OPTIMIZATION TECHNIQUES FOR DATA SCIENCE

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction- mathematical optimization, least-squares and linear programming, convex and nonlinear optimization. convex sets.

UNIT II: Convex optimization problems - optimization problem in standard form, convex optimization problems, quasi-convex optimization, linear optimization

UNIT III: Quadratic optimization: generalized inequality constraints, semi definite programming, vector optimization. Duality, approximation and fitting, statistical estimation, geometric problems

UNIT IV: Unconstrained minimization- gradient descent method, steepest descent method, Newton's method.

UNIT V: Equality constrained minimization - equality constrained minimization, eliminating equality constraints, Newton's method with equality constraints, infeasible start Newton method, and implementation.

UNIT VI: Interior-point methods -inequality constrained minimization, logarithmic barrier function and central path, barrier method, L1 Norm optimization methods.

UNIT VII: Introduction to Neural Networks - Alternating direction method of multipliers (ADMM) and applications (16 applications mentioned by Prof. Stephen Boyd)

Text Books:

1. Kalyanmoy, Deb. Optimization for engineering design: Algorithms and examples. Prentice-Hall of India Pvt. Limited, 2012.

Reference Books:

1. Chong, Edwin KP, and Stanislaw H. Zak. An introduction to optimization. John Wiley & Sons, 2004.
2. Bhatti, M. Asghar. Practical Optimization Methods: With Mathematica® Applications. Springer Science & Business Media, 2012
3. Stephen P. Boyd, and Lieven Vandenberghe. Convex optimization. Cambridge university press, 2004

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Elective-II Time Series Data Analysis

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to time series analysis, stationary and non stationary datasets. Finding the trend and seasonal components of signal. Auto Correlation Function (ACF) and Partial Auto Correlation Function (PACF).

UNIT II: Stationary Process and ARMA Models: Forecasting stationary time series using ARMA.

UNIT III: Nonstationary and Seasonal Time Series Models: Seasonal ARIMA models.

UNIT IV: Multivariate Time Series: Multivariate ARMA processes, Modeling and forecasting

UNIT V: Forecasting Techniques: The Holt-Winter algorithm & Holt-Winter seasonal algorithm.

UNIT VI: Time series forecasting using ML algorithms: Linear Regression ,Multi Linear Regression and ensemble techniques.

UNIT VII: Introduction to Recurrent Neural Networks (RNN), Long Short Term Memory (LSTM) and its role in time series forecasting.

Text Books:

1. Brockwell, Peter J. and Davis, Richard A. (2002). Introduction to Time Series and Forecasting, 2nd edition. Springer-Verlag, New York.

Reference Books:

1. Shumway, R.H and Stoffer, D.S., Time Series Analysis and its Applications: With r Examples, Springer.
2. Box, G.E.P., Jenkins, G.M. and Reinsel, G.C. (1994). Time Series Analysis: Forecasting and Control, 3rd Edition, Prentice Hall, New Jersey.
3. Chatfield, C. (1996). The Analysis of Time Series, 5th edition, Chapman and Hall, New York.
4. James D. Hamilton (1994). Time Series Analysis, 1st Edition, Princeton University Press

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Elective-II Natural Language Processing

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: INTRODUCTION: Origins and challenges of NLP - Language Modelling: Grammar-based LM, Statistical LM - Regular Expressions, Finite-State Automata - English Morphology, Transducers for lexicon and rules,
Tokenization, Detecting and Correcting Spelling Errors, Minimum Edit Distance.

UNIT II: WORD LEVEL ANALYSIS: Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff - Word Classes.

UNIT III: MODELS FOR SEQUENTIAL TAGGING: Smoothing, Interpolation and Backoff - Word Classes, Part of-
Speech Tagging, Rule-based, Named Entities and Named Entities Tagging, Evaluation of Named Entity Recognition,Vector Semantics Embedding, Lexical Semantics.

UNIT IV: SYNTACTIC ANALYSIS: Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar -Dependency Grammar - Syntactic Parsing, Ambiguity

UNIT V: DYNAMIC PROGRAMMING PARSING- Shallow parsing– Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs – Feature structures, Unification of feature structures.

UNIT VI: SEMANTICS AND PRAGMATICS: Requirements for representation, First-Order Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selectional restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus,
Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods.

UNIT VII: DISCOURSE ANALYSIS AND LEXICAL RESOURCES: Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution – Resources: Porter Stemmer, Lemmatizer, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus(BNC).

Text Books:

1. Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, 2nd Edition, Daniel Jurafsky, James H. Martin—Pearson Publication, 2014.

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Reference Books:

1. Natural Language Processing with Python, First Edition, Steven Bird, Ewan Klein and Edward Loper, OReilly Media, 2009.
2. Language Processing with Java and LingPipe Cookbook, 1st Edition, Breck Baldwin, Atlantic Publisher, 2015.
3. Handbook of Natural Language Processing, Second, Nitin Indurkhya and Fred J. Damerau, Chapman and Hall/CRC Press, 2010. Edition.
4. Natural Language Processing and Information Retrieval, 3rd Edition, Tanveer Siddiqui, U.S. Tiwary, Oxford University Press, 2008.

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Elective-II Statistical Modeling

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to Random process, types and their probability distributions, Expectation, mean and variance,

UNIT II: Sampling: Estimating the Population Mean (μ), Population Proportion, Sample Size and its Determination. Sample Size through the Approach Based on Precision Rate and Confidence Level.

UNIT III: Hypothesis testing- Z, t, Chi-Square & F-test. ANOVA & Designs of Experiments - Single, Two factor ANOVA, Factorials ANOVA models.

UNIT IV: Model selection, AIC, BIC, SIC, bias-variance trade-off; ARMA models.

UNIT V: Univariate Regression and its estimation techniques and analysis

UNIT VI: Multivariate Regression and its estimation techniques and analysis

UNIT VII: State-space models, Kalman filter, hidden state, HMM, Switching models, hidden Markov models.

Text Books:

1. Jay L. Devore, Probability and Statistics for Engineering and the Sciences, 8th edition, Cengage, 2012.

Reference Books:

1. T. VeeraRajan, Probability, Statistics and Random processes, Tata McGraw-Hill,2008
2. Research Methodology: Methods and Techniques: C.R. Kothari, New Age International Publishers
3. Sheldon M. Ross, Introduction to probability and statistics for engineers and scientists, 4th edition, Elsevier, 2009.
4. Levin R.I. and Rubin D.S., Statistics for Management, 7th edition, Prentice Hall of India Pvt. Ltd., New Delhi, 2001

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Data Science Applications with Python Lab

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week **Time: 3 Hours** **Credits: 2**
Internal: 50 Marks **External: 50 Marks** **Total: 100 Marks**

Experiment 1:
Write a Python Program to Find the Sum of the Series: 1 + 1/2 + 1/3 + .. + 1/N

Experiment 2:
Write a Python Program to Split the array and add the first part to the

Experiment 3:
Write a Python Program to Create a List of Tuples with the First Element as the Number and Second Element as the Square of the Number

Experiment 4:
Write a Python program to count number of vowels using sets in given string

Experiment 5:
Write a program to implement permutation of a given string using inbuilt function.

Experiment 6:
Write a python program to sort list of dictionaries by values in Python – Using lambda function.

Experiment 7:
Write a Python Program for following sorting:
i. Quick Sort ii. Heap Sort

Experiment 8:
Write a Python Program to Reverse a String Using Recursion

Experiment 9:
Write a Python Program to Count the Number of Words in a Text File

Experiment 10:
Write a Python Program to Read the Contents of a File in Reverse Order

Experiment 11:
Write a program to Merge and Join DataFrames with Pandas in Python

Experiment 12:

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Annexure-XXI

Write a program to implement Merge and Join DataFrames with Python Pandas

Experiment 13:
Write a Python Program to Append the Contents of One File to Another File

Experiment 14:
How to install and Load CSV files to Python Pandas

Experiment 15:
Write a program to implement Data analysis and Visualization with Python using pandas.

Experiment 16:
Write a program to Implement Plotting Functions in python pandas

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Cloud Computing and Big Data Analytics Lab

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 2**
Internal: 50 Marks	**External: 50 Marks**	**Total: 100 Marks**

Cloud Computing Programs:

Experiment-1

Create Virtual Machine on Azure

a. A Windows VM
b. Linux VM

Experiment-2

Create a Web app and host it in Azure, use web app to accept files and upload them to blob storage

a. Create Storage accounts in Azure and upload files
b. Create SQL Database to store info
c. Use Azure KeyVault to store secrets such as connection strings
d. Use managed Identity to access secrets from KeyVault, access SQL DB & storage accounts
e. Create Service Bus to accept messages
f. Create App Insights to get logging
g. Create Azure Monitor to get notifications

Experiment-3

Create a function apps

a. Create function app with HTTP trigger
b. Create function app with Timer trigger
c. Create function app with Storage trigger
d. Create Service bus trigger to process messages asynchronously

Experiment-4

Create Traffic Manager / Azure Front Door & APIM

a. Identify the best case scenarios for these

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Experiment-5

Create a Tenant in Azure Active directory

a. Create users in the tenant and use Microsoft Authentication Library (MSAL)
b. Use Azure AD as Identity provider for your web apps

Experiment-6

Create a Azure container registry

a. Deploy a container from the registry to an AppService
b. Create an Azure Kubernetes Cluster and deploy

Experiment-7

Create an Azure Open AI service and use them in your application

Big Data Analytics Programs:

Experiment-1

Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

Experiment-2

Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.
Data available at: https://github.com/tomwhite/hadoopbook/tree/master/input/ncdc/all

Experiment 3:

Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.

Experiment 4:

Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and Indexes

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Machine Learning

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction-Towards Intelligent Machines, Well posed Problems, Example of Applications in diverse fields, Data Representation, Domain Knowledge for Productive use of Machine Learning, Diversity of Data: Structured / Unstructured, Forms of Learning, Machine Learning and Data Mining, Basic Linear Algebra in Machine Learning Techniques.

UNIT II: Supervised Learning- Rationale and Basics: Learning from Observations, Bias and Why Learning Works: Computational Learning Theory, Occam's Razor Principle and Overfitting Avoidance Heuristic Search in inductive Learning, Estimating Generalization Errors, Metrics for assessing regression, Metris for assessing classification

UNIT III: Statistical Learning- Machine Learning and Inferential Statistical Analysis, Descriptive Statistics in learning techniques, Bayesian Reasoning: A probabilistic approach to inference, K-Nearest Neighbor Classifier. Discriminant functions and regression functions, Linear Regression with Least Square Error Criterion, Logistic Regression for Classification Tasks, Fisher's Linear Discriminant and Thresholding for Classification, Minimum Description Length Principle

UNIT IV: Support Vector Machines (SVM)- Introduction, Linear Discriminant Functions for Binary Classification, Perceptron Algorithm, Large Margin Classifier for linearly seperable data, Linear Soft Margin Classifier for Overlapping Classes, Kernel Induced Feature Spaces, Nonlinear Classifier, Regression by Support vector Machines

UNIT V: Learning with Neural Networks: Towards Cognitive Machine, Neuron Models, Network Architectures, Perceptrons, Linear neuron and the Widrow-Hoff Learning Rule, The error correction delta rule

UNIT VI: MLP: Multilayer Perceptron Networks and error back propagation algorithm, Radial Basis Functions Networks

UNIT VII: Decision Tree Learning: Introduction, Example of classification decision tree, measures of impurity for evaluating splits in decision trees, ID3, C4.5, and CART decision trees, pruning the tree, strengths and weakness of decision tree approach.

Text Books:

1. Applied Machine Learning, M.Gopal, Mc Graw Hill Education.

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Reference Books:

1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.
2. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012
3. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer 2009 (freely available online).

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Data Visualization

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction: What Is Visualization?- History of Visualization- Relationship between Visualization and Other fields – The Visualization Process-Pseudocode Conventions-The Scatterplot and The Role of the User.- Data Foundations Types of Data, Structure within and between Records-Data Pre-processing.

UNIT II: Human Perception and Information Processing: What Is Perception? –Physiology-Perceptual Processing- Perception in Visualization- Metrics Visualization Foundations.- The Visualization Process in Detail-Semiology of Graphical Symbols-The Eight Visual Variables-Historical Perspective-Taxonomies-Metrics Visualization Foundations-TheVisualization Process in Detail-Semiology of Graphical Symbols-The Eight Visual Variables-Historical Perspective-Taxonomies

UNIT III: Interaction Concepts: Interaction Operators-Interaction Operands and Spaces,- A Unified Framework.- Interaction Techniques- Screen Space, Object Space (D Surfaces), Data Space (Multivariate Data Values)-Attribute Space (Properties of Graphical Entities)-Data Structure Space (Components of Data Organization)- Visualization Structure Space (Components of the Data Visualization).-Animating Transformations Interaction Control.

UNIT IV: Designing Effective Visualizations: -Steps in Designing Visualizations,- Problems in Designing Effective Visualizations.- Comparing and Evaluating Visualization Techniques-User Tasks- User Characteristics Data Characteristics -Visualization Characteristics-,Structures for Evaluating Visualizations Benchmarking Procedures-,An Example of Visualization Benchmarking

UNIT V: Visualization Systems: Systems Based on Data Type-Systems Based on Data Analysis Type-Text Analysis and Visualization-Modern Integrated Visualization Systems Toolkits

UNIT VI: Research Directions in Visualization: Issues of Data Issues of Cognition-Perception, and Reasoning-Issues of System Design-Issues of Evaluation-Issues of Hardware-Issues of Applications

UNIT VII: Visualization Techniques for Spatial Data: One-Dimensional Data,-Two-Dimensional Data-Three-Dimensional Data-Dynamic Data Combining Techniques
Visualization Techniques for Time-Oriented Data:Introduction, Definitions-Characterizing Time-Oriented Data-Visualizing Time-Oriented Data-Time Bench: A Data Model and Software Library for Visual Analytics of Time-Oriented Data

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Text Books:

1. Ward, Grinstein Keim, Interactive Data Visualization: Foundations, Techniques, and Applications. Natick: A K Peters, Ltd,2015.

Reference Books:

1. Charu C. Aggarwal, Recommender Systems: The Textbook, 1/e, Springer, 2016.
2. Ricci F., Rokach L., Shapira D., Kantor B.P., Recommender Systems Handbook, Springer, 2015.
3. Manouselis N., Drachsler H., Verbert K., Duval E., Recommender Systems for Learning, Springer, 2013. (no update)
4. Kristen Sosulski, Data Visualization Made Simple: Insights into Becoming Visual, Routledge; 1st edition,2018

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Elective-III Image and Video Analytics

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Digital image representation- Visual Perception- Sampling and Quantization- Basic Relations between Pixels- Mathematical Tools Used in Digital Image Processing: Fundamental Operations –Vector and Matric Operations- Image Transforms (DFT, DCT, DWT, Hadamard)..

UNIT II: Fundamentals of spatial filtering: spatial correlation and convolution-smoothingblurringsharpening- edge detection - Basics of filtering in the frequency domain: smoothing-blurring- sharpening- -Histograms and basic statistical models of image.

UNIT III: Colour models and Transformations – Image and Video segmentation-Image and video demonising- Image and Video enhancement- Image and Video compression

UNIT IV: Object detection and recognition in image and video-Texture models Image and Video classification models- Object tracking in Video.

UNIT V: Applications and Case studies- Industrial- Retail- Transportation & Travel- Remote sensingVideo Analytics in WSN: IoT Video Analytics Architectures.

Text Books:

1. " Digital Image Processing". 3rd Edition, R.C. Gonzalez and R.E. Woods Addison Wesley, 2007.

Reference Books:

1. "Computer Vision: Algorithms and Applications", Richard Szelisk, Springer 2011
2. "Nonparametric and Semi parametric Models", W. Härdle, M. Müller, S. Sperlich, A. Werwatz, Springer, 2004.
3. "Intelligent Video Surveillance Systems", Jean-Yves Dufour, Wiley, 2013.
4. "Video Analytics for Business Intelligence", Caifeng Shan, Fatih Porikli, Tao Xiang, Shaogang Gong, Springer, 2012.
5. "Intelligent Transport Systems: Technologies and Applications", AsierPerallos, Unai HernandezJayo, Enrique Onieva, Ignacio Julio García Zuazola, Wiley,2015.
6. "Analysis of Urban Growth and Sprawl from Remote Sensing Data", Basudeb Bhatta, Springer, 2010

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Annexure-XXVI

Elective-III Social Media Analytics

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Social Media Analytics: An Overview Core Characteristics of Social Media, Types of Social Media, Social media landscape, Need for Social Media Analytics (SMA), SMA in small & large organizations. Purpose of Social Media Analytics, Social Media vs. Traditional Business Analytics, Seven Layers of Social Media Analytics, Types of Social Media Analytics, Social Media Analytics Cycle, Challenges to Social Media Analytics, Social Media Analytics Tools.

UNIT II: Social Network Structure, Measures & Visualization Basics of Social Network Structure - Nodes, Edges & Tie Describing the Networks Measures - Degree Distribution, Density, Connectivity, Centralization, Tie Strength & Trust Network Visualization - Graph Layout, Visualizing Network features, Scale Issues. Social Media Network Analytics - Common Network Terms, Common Social Media Network Types, Types of Networks, Common Network Terminologies, Network Analytics Tools

UNIT III: Social Media Text, Action & Hyperlink Analytics

Social Media Text Analytics - Types of Social Media Text, Purpose of Text Analytics, Steps in Text Analytics, Social Media Text Analysis Tools Social Media Action Analytics - What Is Actions Analytics? Common Social Media Actions, Actions Analytics Tools Social Media Hyperlink Analytics - Types of Hyperlinks, Types of Hyperlink Analytics, Hyperlink Analytics Tools

UNIT IV: Social Media Location & Search Engine Analytics Location Analytics - Sources of Location Data, Categories of Location Analytics, Location Analytics and Privacy Concerns, Location Analytics Tools Search Engine Analytics - Types of Search Engines, Search Engine Analytics, Search Engine Analytics Tools

UNIT V: Social Information Filtering Social Information Filtering - Social Sharing and filtering , Automated Recommendation systems, Traditional Vs. social Recommendation Systems Understanding Social Media and Business Alignment, Social Media KPI, Formulating a Social Media Strategy, Managing Social Media Risks

UNIT VI: Social Media Analytics Applications Social media in public sector - Analysing public sector social media, analysing individual users, case study. Business use of Social Media - Measuring success, Interaction and monitoring, case study

UNIT VII: Social Media Analytics Privacy: Privacy - Privacy policies, data ownership and maintaining privacy online.

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Text Books:

1. Seven Layers of Social Media Analytics_ Mining Business Insights from Social Media Text, Actions, Networks, Hyperlinks, Apps, Search Engine, and Location Data, Gohar F. Khan,(ISBN-10: 1507823207)..

Reference Books:

1. Analyzing the Social Web 1st Edition by Jennifer Golbeck
2. Mining the Social Web_ Analyzing Data from Facebook, Twitter, LinkedIn, and Other Social Media Sites, Matthew A Russell, O'Reilly
3. Charu Aggarwal (ed.), Social Network Data Analytics, Springer, 2011
4. Social Media Analytics [2015], Techniques and Insights for Extracting Business Value Out of Social Media, Matthew Ganis, AvinashKohirkar, IBM Press
5. Social Media Analytics Strategy_ Using Data to Optimize Business Performance, Alex Gonçalves, APress Business Team
6. Social Media Data Mining and Analytics, Szabo, G., G. Polatkan, O. Boykin & A. Chalkiopoulus (2019), Wiley, ISBN 978-1-118-82485-6

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Elective-III Deep Learning

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Basics of Deep leaning- Deep learning architectures, Convolution Neural Networks, Neurons in Human Vision-The Shortcomings of Feature Selection-Vanilla Deep Neural Networks Don't Scale-Filters and Feature Maps-Full Description of the Convolution Layer-Max Pooling-Full Architectural Description of Convolution Networks-Closing the Loop on MNIST with Convolutional Networks-Image Preprocessing Pipelines Enable More Robust Models-Accelerating Training with Batch Normalization

UNIT II: Building a Convolutional Network for CIFAR-10-Visualizing Learning in Convolutional NetworksLeveraging Convolutional Filters to Replicate Artistic Styles-Learning Convolutional Filters for Other Problem Domains-Training algorithms

UNIT III: Memory Augmented Neural Networks : Neural Turing Machines-Attention-Based Memory Access-NTM Memory Addressing Mechanisms-Differentiable Neural Computers-Interference-Free Writing in DNCs-DNC Memory Reuse-Temporal Linking of DNC Writes-Understanding the DNC Read Head-The DNC Controller Network- Visualizing the DNC in Action-Implementing the DNC in TensorFlow-Teaching a DNC to Read and Comprehend

UNIT IV: Deep Reinforcement Learning: Deep Reinforcement Learning Masters Atari Games- What Is Reinforcement Learning?-Markov Decision Processes (MDP)-Explore Versus Exploit-Policy versus Value Learning-Pole-Cart with Policy Gradients-Q-Learning and Deep Q-Networks-Improving and Moving Beyond DQN

UNIT V: Implementing Neural Networks in TensorFlow : What Is TensorFlow?-How Does TensorFlow Compare to Alternatives?-Installing TensorFlow-Creating and Manipulating TensorFlow VariablesTensorFlow Operations-Placeholder Tensors

UNIT VI: Sessions in TensorFlow-Navigating Variable Scopes and Sharing Variables- Managing Models over the CPU and GPU-Specifying the Logistic Regression Model in TensorFlow-Logging and Training the Logistic Regression Model-Leveraging TensorBoard to Visualize

UNIT VII: Computation Graphs and Learning-Building a Multilayer Model for MNIST in TensorFlow. Applications: Deep learning for computer vision, Deep Learning Applications at the Enterprise Scale, Deep Learning Models for Healthcare Applications

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Text Books:

1. "Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms", Nikhil Buduma, Nicholas Locascio, O'Reilly Media, 2017.

Reference Books:

1. "Deep Learning (Adaptive Computation and Machine Learning series", Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press, 2017
2. Deep learning from first principle,2nd edition,tinniam v Ganesh,2018
3. Introduction to Deep Learning ,1st edition, by Eugene charniak,The MIT Press,2019

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Elective-III Business Analytics

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Business statistics- Intro to Probability, Discrete Random Variables- Measures of central tendency-measures of dispersion-correlation methods

UNIT II: Python and R programming- Data Types-Decision Structures-Functions –File operations and Libraries and packages

UNIT III: Managing data resources- types of databases- Big Data NoSQL databases-DataWarehousing and Data mining techniques

UNIT IV: Data science forecasting techniques/tools- Statistical Forecasting Models-Forecasting Models for Stationary Time Series-Forecasting Models for Time Series with a Linear Trend, Forecasting Time Series with Seasonality, Regression Forecasting with Casual Variables, Selecting Appropriate Forecasting Models

UNIT V: Data visualization- Visualization techniques for business data- Line charts-Bar charts-Pie charts-Bubble charts-Histograms-Heatmaps- Scatter plot st-SNE

UNIT VI: Business applications-E-business systems-digital marketing systems-Transactional processing systems-Enterprise Application architecture and integration.Case studies

UNIT VII: Development and security challenges in business analytics Ethical responsibility of Business professionals-Privacy issues-security challenges-Introduction to Access Control, Purpose and fundamentals of access control, brief history.Policies of Access Control, Models of Access Control

Text Books:

1. Ramesh Behl: Business information systems,McGraw Hill..

Reference Books:

1. James Evans:Business Analytics, Pearson Education, 2013.
2. S.C Gupta : Fundamentals of Statistics

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Elective-III High Performance Computing

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to Parallel Computing: Scope of Parallel Computing, Implicit Parallelism: Trends in Microprocessor Architectures, Limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs in Parallel Machines. Taxonomy of parallel computing paradigms, Shared-memory computers, Distributed-memory computers.

UNIT II: Analytical Modelling of Parallel Programs: Sources of Overhead in Parallel Programs, Performance Metrics for Parallel Systems, The Effect of Granularity on Performance, Scalability of Parallel Systems, Minimum Execution Time and Minimum Cost-Optimal Execution Time, Asymptotic Analysis of Parallel Programs

UNIT III: Programming Using the Message-Passing Paradigm: Principles of Message-Passing Programming, The Building Blocks: Send and Receive Operations, MPI: the Message Passing Interface, Topologies and Embedding, Overlapping Communication with Computation, Groups and Communicators

UNIT IV: Distributed-memory parallel programming with MPI: Message passing, A short introduction to MPI, Example: MPI parallelization of a Jacobi solver, MPI performance tools, Communication parameters, Synchronization, serialization, contention, Reducing communication overhead

UNIT V: Shared-memory parallel programming with OpenMP: Short introduction to OpenMP, OpenMP-parallel Jacobi algorithm, Wavefront parallelization, Profiling OpenMP programs, Performance pitfalls, Case study: Parallel sparse matrix-vector multiply

UNIT VI: Locality optimizations on ccNUMA architectures: Locality of access on ccNUMA, Case study: ccNUMA optimization of sparse MVM, Placement pitfalls, ccNUMA issues with C++.

UNIT VII: Parallel Algorithms on Sorting, Dense Matrix Algorithms, Graph Algorithms

Text Books:

1. Georg Hager and Gerhard Wellein. Introduction to High Performance Computing for Scientists and Engineers (1st ed.). CRC Press, Chapman & Hall/CRC Computational Science, India, 2010.

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Reference Books:

1. Vipin Kumar , Ananth Grama , Anshul Gupta , George Karypis. Introduction to Parallel Computing (2nd ed.). Pearson India . 2003.
2. John L. Hennessy and David A. Patterson. Computer Architecture: A Quantitative Approach (5th ed.). Elsevier India Pvt. Ltd. 2011.
3. David B. Kirk and Wen-mei W. Hwu. Programming Massively Parallel Processors: A Hands-On Approach (1st ed.). Elsevier India Pvt. Ltd. 2010.
4. Michael T. Heath. Scientific Computing: An Introductory Survey (2nd ed.). McGraw Hill Education (India) Private Limited

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Elective-IV Geographic Information System

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to GIS Basic concepts: Definition and history, Components of GIS, Recent trends and applications of GIS; Data structure and formats, Spatial data models – Raster and vector, Data base design- editing and topology creation in GIS, Linkage between spatial and non-spatial data, Data inputting in GIS. Rectification, Transformation Methods; Root Mean Square (RMS) Error.

UNIT II: Data Types and Data Models Data Types; Spatial Data; Non-Spatial Data, Data Input; Existing GIS Data, Metadata; Conversion of Existing Data, Creating New Data, Data Models; Vector Data Model; Raster Data Model; Integration and Comparison of Vector and Raster Data Models

UNIT III: Spatial Data Editing Types of Digitizing Errors, Causes for Digitizing Errors; Topological Editing and Non-topological Editing; Other Editing Operations; Editing Using Topological Rules.

UNIT IV: Attribute Data and Data Exploration Attribute Data in GIS, Attribute Data Entry, Manipulation of Fields and Attribute Data, Data Exploration; Attribute Data Query, Raster Data Query, Map- Based Data Manipulation

UNIT V: Spatial Analysis Spatial Data: Definition, Analysis, Processes & Steps, Software and Tools, Geodatabase Model, Role of Databases in GIS, Creating, Editing and Managing, Classification scheme of Vector- Based and Raster- Based GIS Operation Raster- Based Techniques: Methods of reclassification, overlay analysis, Digital Terrain Analysis and Modeling- TIN and DEM, Surface representation and analysis, Slope and Aspect, Geographic Visualization Data Classification, Map Comparison

UNIT VI: Geo Statistical Analysis Techniques: Introduction to Spatial Interpolation: Control Points, Global Method- Trend surface analysis, regression model, local methods- Thiessen polygons, density estimation, Inverse Distance weighted Interpolation, Kriging- Ordinary Kriging and Universal Kriging, GIS and decision support system, Introduction to AHP, basic principal of AHP. Principal and components of multiple criteria decision making.

Text Books:

1. kang-tsung Chang (2007), 'Introduction to Geographic Information Systems' Tata MCGraw Hill, New Delhi.

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Reference Books:

1. C.P.Lo and Albert K.W. Yeung (2006) "Concepts and Techniques of Geographic information Systems" Prentice Hall of India, New Delhi
2. Burrough, Peter A. and Rachael McDonnell, (1998), 'Principles of Geographical Information Systems' Oxford University press, New York.
3. Magwire, D.J. Goodchild, M.F. and Rhind, D.M., (2005), 'Geographical Information Systems: Principles and Applications', Longman Group, U.K.
4. Burrough, P.A., 1986, Geographical Information System for land Resources System, Oxford Univ. Press, UK.
5. Fotheringham, S.; Rogerson, P. (ed.), 1994. Spatial analysis and GIS. Taylor and Francis, London, UK.
6. Laurini, Robert and Dierk Thompson, 1992, Fundamentals of Spatial Information Systems, Academics Press, ISBN 0-12-438380-7.
7. Maguire,D.J.; Goodchild, M.F.; Rhind,D.W. 1991.Geographical information System, Longman, London,UK
8. Siddiqui, M.A.; 2006, Introduction to Geographical Information System, Sharda Pustak Bhavan, Allahabad.
9. Siddiqui, M.A.; 2011, Concepts and Techniques of Geoinformatics, Sharda Pustak Bhavan, Allahabad.

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Elective-IV Block Chain Technology

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction: Scenarios, Challenges Articulated, Blockchain, Blockchain Characteristics, Opportunities Using Blockchain, History of Blockchain.
Evolution of Blockchain: Evolution of Computer Applications, Centralized Applications, Decentralized Applications, Stages in Blockchain Evolution, Consortia, Forks, Public Blockchain Environments, Type of Players in Blockchain Ecosystem, Players in Market.

UNIT II: Blockchain Concepts: Introduction, Changing of Blocks, Hashing, Merkle-Tree, Consensus, Mining and Finalizing Blocks, Currency aka tokens, security on blockchain, data storage on blockchain, wallets, coding on blockchain: smart contracts, peer-to-peer network, types of blockchain nodes, risk associated with blockchain solutions, life cycle of blockchain transaction

UNIT III: Architecting Blockchain solutions: Introduction, Obstacles for Use of Blockchain, Blockchain Relevance Evaluation Framework, Blockchain Solutions Reference Architecture, Types of Blockchain Applications, Cryptographic Tokens, Typical Solution Architecture for Enterprise Use Cases, Types of Blockchain Solutions, Architecture Considerations, Architecture with Blockchain Platforms, Approach for Designing Blockchain Applications

UNIT IV: Ethereum Blockchain Implementation: Introduction, Tuna Fish Tracking Use Case, Ethereum Ecosystem, Ethereum Development, Ethereum Tool Stack, Ethereum Virtual Machine, Smart Contract Programming, Integrated Development Environment, Truffle Framework, Ganache, Unit Testing, Ethereum Accounts, MyEtherWallet, Ethereum Networks/Environments, Infura, Etherscan, Ethereum Clients, Decentralized Application, Metamask, Tuna Fish Use Case Implementation, OpenZeppelinContract

UNIT V: Hyperledger Blockchain Implementation: Introduction, Use Case — Car Ownership Tracking, Hyperledger Fabric, Hyperledger Fabric Transaction Flow, FabCar Use Case Implementation, Invoking Chaincode Functions Using Client Application

UNIT VI: Advanced Concepts in Blockchain: Introduction, InterPlanetary File System (IPFS), Zero-Knowledge Proofs, Oracles, Self-Sovereign Identity, Blockchain with 10T and Al/ML Quantum Computing and Blockchain, Initial Coin Offering, Blockchain Cloud Offerings, Blockchain and its Future Potential.

UNIT VII: Technical challenges, Business model challenges, Scandals and Public perception, Government Regulations, Uses of Block chain in E-Governance, Land Registration, Medical Information Systems.

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Text Books:

1. "Blockchain for Enterprise Application Developers", Ambadas, Arshad SarfarzAriff, Sham Wiley.

Reference Books:

1. "Mastering Bitcoin: Programming the Open Blockchain", Andreas M. Antonpoulos,O'Reilly
2. Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions, Joseph Bambara, Paul R. Allen, Mc GrawHill.
3. Blockchain: Blueprint for a New Economy, Melanie Swan,O'Reilly

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Elective-IV Secure Software Design

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Secure Software Design Identify software vulnerabilities and perform software security analysis, Master security programming practices, Master fundamental software security design concepts, Perform security testing and quality assurance.

UNIT II: Enterprise Application Development Describe the nature and scope of enterprise software applications, Design distributed N-tier software application, Research technologies available for the presentation, business and data tiers of an enterprise software application, Design and build a database using an enterprise database system, Develop components at the different tiers in an enterprise system, Design and develop a multi-tier solution to a prob

UNIT III: Enterprise Systems Administration Design, implement and maintain a directory-based server infrastructure in a heterogeneous systems environment, Monitor server resource utilization for system reliability and availability, Install and administer network services (DNS/DHCP/Terminal Services/Clustering/Web/Email).

UNIT IV: Enterprise Network Obtain the ability to manage and troubleshoot a network running multiple services, Understand the requirements of an enterprise network and how to go about managing them

UNIT V: Defending Applications Handle insecure exceptions and command/SQL injection, Defend web and mobile applications against attackers, software containing minimum vulnerabilities and flaws

Text Books:

1. Theodor Richardson, Charles N Thies, Secure Software Design, Jones & Bartlett.

Reference Books:

1. Kenneth R. van Wyk, Mark G. Graff, Dan S. Peters, Diana L. Burley, Enterprise Software Security, Addison Wesley

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Elective-IV Data Storage Technologies and Networks

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Storage Media and Technologies – Magnetic, Optical and Semiconductor Media, Techniques for read/write Operations, Issues and Limitations.

UNIT II: Usage and Access – Positioning in the Memory Hierarchy, Hardware and Software Design for Access, Performance issues

UNIT III: Large Storages – Hard Disks, Networked Attached Storage, Scalability issues, Networking issues

UNIT IV: Storage Architecture - Storage Partitioning, Storage System Design, Caching, Legacy Systems

UNIT V: Storage Area Networks – Hardware and Software Components, Storage Clusters/Grids. Storage QoS– Performance, Reliability and Security issues

Text Books:

1. The Complete Guide to Data Storage Technologies for Network-centric Computing Paperback– Import, Mar 1998 by Computer Technology Research Corporation

Reference Books:

1. Data Storage Networking: Real World Skills for the CompTIA Storage by Nigel Poulton

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Annexure-XXXIV

Elective-IV INFORMATION RETRIEVAL SYSTEMS

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Introduction to Information Retrieval: Motivation, Information Retrieval vs Data Retrieval, Domain Analysis of IR systems, The retrieval process. **Introduction to Data Structures and Algorithms related to Information Retrieval**: Basic Concepts, Data structures, Algorithms.**IR System Evaluation**: Recall and Precision, Alternative Measures, Reference Collections and Evaluation of IR systems.

UNIT II: Modelling: Classic information retrieval models- Boolean Model, Vector Space Model, Probabilistic Model, Alternative Models, and Comparison

UNIT III: Query Languages for IR: Introduction, Key words based: Single word, Boolean Queries, Context Queries, Natural Language Queries, Structural Queries

UNIT IV: Text Processing: Document Processing, Text Comparison.
Stemming Algorithms: Introduction, Types of Stemming Algorithms, Experimental Evaluations of Stemming to Compress Inverted Files
Thesaurus Construction: Introduction, Features of Thesauri, Thesaurus Construction, Thesaurus construction from Texts, Merging existing Thesauri

UNIT V: Indexing: Introduction, Inverted files, PAT Trees, Signature files.
Inverted files- Introduction, Structures used in Inverted Files, Building Inverted file using a sorted array, Modifications to Basic Techniques.

UNIT VI: New Indices for Text: PAT Trees and PAT Arrays: Introduction, PAT Tree structure, algorithms on the PAT Trees, Building PAT trees as PATRICA Trees, PAT representation as arrays

UNIT VII: Signature Files: Introduction, Concepts of Signature Files, Compression, Vertical Partitioning, Horizontal Partitioning

Text Books:

1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992..

Reference Books:

1. Modern Information Retrieval by Yates Pearson Education.
2. Information Storage & Retrieval by Robert Korfhage – John Wiley & Sons Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.
3. Information retrieval Algorithms and Heuristics, 2ed, Springer

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MACHINE LEARNING LAB

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 3**
Internal: 50 Marks	**External: 50 Marks**	**Total: 100 Marks**

List of Experiments:

1. Implement Principal Component Analysis (PCA) and Singular Value Decomposition (SVD) using NumPy
2. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
3. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.
4. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
5. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets.
6. Write a program to implement the naïveBayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
7. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.
8. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.
9. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.

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10. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
11. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.
12. Create the following plots using Matplotlib, Pandas Visualization, Seaborn on iris dataset, wine reviews datasets.
    a) Scatter Plot
    b) Line chart
    c) Histogram
    d) Heatmap

Text Books:

1. Hands–On Machine Learning with Scikit–Learn and TensorFlow 2e: Concepts, Tools, and Techniques to Build Intelligent Systems, AurelienGeron, 2019.

Reference Books:

1. https://scikit-learn.org/stable/tutorial/index.html
2. https://archive.ics.uci.edu/ml/index.php
3. https://towardsdatascience.com/pca-and-svd-explained-with-numpy-5d13b0d2a4d8
4. https://towardsdatascience.com/introduction-to-data-visualization-in-python-89a54c97fbed

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Data Visualization using Tableau Lab

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 2**
Internal: 50 Marks	**External: 50 Marks**	**Total: 100 Marks**

List of Experiments:

Module 1: Tableau Course Material

- Start Page
- Show Me
- Connecting to Excel Files
- Connecting to Text Files
- Connect to Microsoft SQL Server
- Connecting to Microsoft Analysis Services
- Creating and Removing Hierarchies
- Bins
- Joining Tables
- Data Blendin

Module 2: Learn Tableau Basic Reports

- Parameters
- Grouping Example 1
- Grouping Example 2
- Edit Groups
- Set
- Combined Sets
- Creating a First Report
- Data Labels
- Create Folders
- Sorting Data
- Add Totals, Sub Totals and Grand Totals to Report

Module 3: Learn Tableau Charts

- Area Chart
- Bar Chart
- Box Plot
- Bubble Chart
- Bump Chart
- Bullet Graph
- Circle Views
- Dual Combination Chart

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- Dual Lines Chart
- Funnel Chart
- Traditional Funnel Charts
- Gantt Chart
- Grouped Bar or Side by Side Bars Chart
- Heatmap
- Highlight Table
- Histogram
- Cumulative Histogram
- Line Chart
- Lollipop Chart
- Pareto Chart
- Pie Chart
- Scatter Plot
- Stacked Bar Chart
- Text Label
- Tree Map
- Geographic map

Module 4: Custom SQL

- Convert to Custom SQL

Module 5: Learn Tableau Advanced Reports

- Dual Axis Reports
- Blended Axis
- Individual Axis
- Add Reference Lines
- Reference Bands
- Reference Distributions
- Basic Maps
- Symbol Map
- Use Google Maps

Module 6: Learn Tableau Calculations & Filters

- Calculated Fields
- Basic Approach to Calculate Rank
- Advanced Approach to Calculate Rank
- Calculating Running Total
- Filters Introduction
- Quick Filters
- Filters on Dimensions

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- Conditional Filters
- Top and Bottom Filters
- Filters on Measures
- Context Filters
- Slicing Filters
- Data Source Filters
- Extract Filters

Module 7: Learn Tableau Dashboards

- Create a Dashboard
- Format Dashboard Layout
- Create a Device Preview of a Dashboard
- Create Filters on Dashboard
- Dashboard Objects
- Create a Story

Module 8: Tableau data server

- Physical architecture overview
- User access
- Component functions & processes
- Tableau server on-premises
- Tableau reader
- Tableau online v tableau server

Module 9: Tableau Server UI

- Tableau server user interface
- Users
- Site roles
- Groups
- Schedules
- Tasks
- Tableau server menu
- Content display options

Text Books:

1. Fundamentals of Data Visualization, Claus O. Wilke, O'Reilly
2. Tableau Data Visualization Cookbook, Ashutosh Nandeshwar, Packt Publishing

Reference Links:

1. https://archi ableau Data Visualization Cookbook ve.ics.uci.edu/ml/index.php
2. https://www.coursera.org/specializations/data-visualization

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Research Methodology & IPR

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 2**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

Unit 1: Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations.

Unit 2: Effective literature studies approaches, analysis Plagiarism, Research ethics

Unit 3: Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

Unit 4: Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

Unit 5: Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.

Unit 6: New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

Reference Books:

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science& engineering students'"
2. Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
3. Ranjit Kumar, 2 ndEdition, "Research Methodology: A Step by Step Guide for beginners"
4. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd,2007.
5. Mayall, "Industrial Design", McGraw Hill, 1992.
6. Niebel, "Product Design", McGraw Hill, 1974.
7. Asimov, "Introduction to Design", Prentice Hall, 1962.
8. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.
9. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008

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Organizational Behavior (Audit Course)

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 0**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Organizational Behavior: Concept of Organization - Concept of Organizational Behavior - Nature of Organizational Behavior - Role of Organizational behavior - Disciplines contributing to Organizational Behavior.

UNIT II: Motivation: Definition - Nature of Motivation - Role of Motivation - Theories of Motivation: Maslow's Need Hierarchy Theory, Herzberg's Motivation Hygiene Theory and McGregor's Theory X and Theory Y.

UNIT III: Group Dynamics: Meaning - Concept of Group - Types of groups -Formal and Informal groups - Group development - Group cohesiveness and factors affecting group cohesiveness

UNIT IV: Leadership: Concept of Leadership - Difference between Leadership and Management - Importance of Leadership - Leadership styles: Autocratic leadership, Participative leadership and Free Rein leadership.

UNIT V: Communication: Meaning - Communication Process - Forms of communication: Oral, Written and Non- Verbal communication - Direction of communication: Downward, Upward and Horizontal communication.

UNIT VI: Organizational conflicts: Concept of conflict - Reasons for conflict - Types of Conflict:Intrapersonal conflict, Interpersonal conflict, Intragroup conflict, Intergroup conflict, Inter organizational conflict - Conflict management.

UNIT VII: Organizational Change: Nature - Factors in Organizational change -Planned change: Process of planned change - Resistance to change: Factors in resistance to change – Overcoming resistance to change.

Text Books:

1. L.M.Prasad: Organizational Behavior, Sultan Chand & Sons, New Delhi -110002.

Reference Books:

1. K. Aswathappa: Organizational Behavior, Himalaya Publishing House, New Delhi.
2. Stephen Robbins: Organizational Behavior, Pearsons Education, New Delhi.

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ENTREPRENEURSHIP (AUDIT COURSE)

M. Tech-Computer Science and Engineering (Data Science)

Instruction: 3 Periods/week	**Time: 3 Hours**	**Credits: 0**
Internal: 30 Marks	**External: 70 Marks**	**Total: 100 Marks**

UNIT I: Basic Concepts of Management: Definition, Nature and Importance ; Functions of the Management; Levels of Management; F.W Taylor's Scientific Management; Henry Fayol's Principles of Management.

UNIT II: Forms of Business Organizations: Introduction, Types of Business organizations: Private Sector- Individual Ownership , Partnership, Joint stock companies and Co-Operative organizations; Public sector- Departmental Organizations, Public Corporations and Government Companies; The Joint sector Management

UNIT III: Production and operations Management: Plant location- Factors to be considered in the selection of Plant location; Break - even analysis- Significance and managerial applications; Importance of Production Planning and Control and its Functions; Human Resource Management and Functions of Human Resource Manager (in brief); Functions of Marketing; Methods of Raising Finance

UNIT IV: Entrepreneurship: Definition, Characteristics and Skills , Types of Entrepreneurs, Entrepreneur vs. Professional Managers, , Growth of Entrepreneurs, Nature and Importance of Entrepreneurs, Women Entrepreneurs, Problems of Entrepreneurship.

UNIT V: Entrepreneurial Development and Project Management: Institutions in aid of Entrepreneurship Development, Idea generation: Sources and Techniques;, Stages in Project formulation ; Steps for starting a small enterprise - Incentives for Small Scale Industries by Government

Text Books:

1. Sharma,S.C, and Banga, T.R., Industrial Organization & Engineering Economics, Khanna Publishers, Delhi, 2000.

Reference Books:

1. VasantDesai ,The Dynamics of Entrepreneurial Development and Management (Planning for future Sustainable growth),HImalayan Publishing House, 2018
2. Aryasri , A.R., Management Science, McGraw HIll Education (India Private Limited , New Delhi 2014.
3. Sheela, P. , and JagadeswaraRao, K., Entrepreneurship, Shree Publishing House, Guntur

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GVP COLLEGE OF ENGINEERING FOR WOMEN
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.Tech -VLSI DESIGN & EMBEDDED SYSTEMS
Course Structure and Scheme of Valuation w.e.f. 2024-25 admitted batch

I SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24EC21RC01	Analog and Digital CMOS VLSI Design	3	-	70	30	100	3
24EC21RC02	Embedded Systems Design	3	-	70	30	100	3
24EC21PE01	Elective-I	3	-	70	30	100	3
24EC21PE02	Elective-II	3	-	70	30	100	3
24HM21AC01	Research Methodology &IPR	2	-	70	30	100	2
24HM21AC02	Organizational Behavior (Audit Course)	3	-	-	100	100	0
24EC21RC03	Analog and Digital CMOS VLSI Design Lab	-	3	50	50	100	1.5
24EC21RC04	Embedded system Design Lab	-	3	50	50	100	1.5
	Total	**17**	**6**	**450**	**350**	**800**	**17**

Elective-I: Application Specific Integrated Circuit (ASIC)/ Advanced Operating Systems/ Parallel Processing

Elective II: CPLD and FPGA Architectures & Applications / Electronic Design Automation Tools/ Digital System Design

II SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24EC21RC05	RTL Design & Verification using System Verilog	3	-	70	30	100	3
24EC21RC06	Internet of Things and its Applications	3	-	70	30	100	3
24EC21PE03	Elective-III	3	-	70	30	100	3
24EC21PE04	Elective-IV	3	-	70	30	100	3
24HM21AC03	Entrepreneurship (Audit course)	3	-	-	100	100	0
24EC21RC07	RTL Design & Verification using System Verilog Lab	-	3	50	50	100	1.5
24EC21RC08	Internet of Things and its Applications Lab	-	3	50	50	100	1.5
24EC21PR01	Mini Project with Seminar	-	4	-	100	100	2
	Total	**15**	**10**	**380**	**420**	**800**	**17**

Elective III: Low Power VLSI Design/ System on Chip Design/ Digital Signal and Image Processing

Elective IV: Communication Buses and Interfaces / Design for Testability/ DSP Processors and Architectures

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ANNEXURE - IX

ANALOG AND DIGITAL CMOS VLSI DESIGN
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand the concepts of MOS Devices and Modeling
CO2:	Analyze the CMOS sub circuits
CO3:	Illustrate the concepts of MOS Design and compare the characteristics of a Psuedo-nMOS and CMOS Inverter.
CO4:	Design and analysis of Combinational Circuits using NMOS logic, CMOS logic and Transmission gate logic.
CO5:	Design and analysis of Sequential Circuits using nMOS logic, CMOS logic and Transmission gate logic.

UNIT-I

Technology Scaling and Road map, Scaling issues, Standard 4 mask NMOS Fabrication process

Digital CMOS Design:

Basic MOS structure and its static behavior, Quality metrics of a digital design: Cost, Functionality, Robustness, Power, and Delay, Stick diagram and Layout, Wire delay models. Inverter: Static CMOS inverter, Switching threshold and noise margin concepts and their Evaluation, Dynamic behavior, Power consumption.

UNIT-II

Physical design flow

Floor planning, Placement, Routing, CTS, Power analysis and IR drop estimation-static and dynamic, ESD protection-human body model, Machine model. Combinational logic: Static CMOS design, Ratioed logic, Pass transistor logic, Dynamic logic, Speed and power dissipation in dynamic logic, Cascading dynamic gates, CMOS transmission gate logic.

UNIT-III

Sequential logic

Static latches and registers, Bi-stability principle, MUX based latches, Static SR flip-flops, Master-slave edge-triggered register, Dynamic latches and registers, Concept of pipelining, ulse registers, non-bistable sequential circuit. Advanced technologies: Giga-scale dilemma, short channel effects, High–k, Metal Gate Technology, FinFET, TFET etc.

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UNIT-IV
Analog CMOS Design: Single Stage Amplifier CS stage with resistance load, Divide connected load, Current source load, Triode load, CS stage with source degeneration, Source follower, Common gate stage, Cascade stage, Choice of device models. Differential Amplifiers: Basic difference pair, Common mode response, Differential pair with MOS loads, Gilbert cell.

UNIT-V
Passive and active current mirrors Basic current mirrors, Cascade mirrors, Active current mirrors. Frequency response of CS stage: Source follower, Common gate stage, Cascade stage and difference pair, Noise. Operational amplifiers: One stage OPAMP.

Text Books:
1. J P Rabaey, A P Chandrakasan, B Nikolic, "Digital Integrated circuits: A design perspective", Prentice Hall electronics and VLSI series, 2nd Edition. 2. Baker, Li, Boyce, "CMOS Circuit Design, Layout, and Simulation", Wiley, 2nd Edition. 3. Behzad Razavi, "Design of Analog CMOS Integrated Circuits", TMH, 2007.
Reference Books:
1. Phillip E. Allen and Douglas R. Holberg, "CMOS Analog Circuit Design", Oxford, 3rd Edition. 2. R J Baker, "CMOS circuit Design, Layout and Simulation", IEEE Inc., 2008. 3. Kang, S. and Leblebici, Y., "CMOS Digital Integrated Circuits, Analysis and Design", TMH, 3rdEdition. 4. Pucknell, D.A. and Eshraghian, K., "Basic VLSI Design", PHI, 3rd Edition.

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ANNEXURE - X

EMBEDDED SYSTEMS DESIGN
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Analyze the quality principles and tools in embedded system during product development process and Design interface circuit with processor and memory devices.
CO2:	Understand the architectural and programming concepts of ARM controllers.
CO3:	Compare and select ARM processor core based SoC with several features/peripherals based on requirements of embedded applications.
CO4:	Develop software programs to control embedded system using C
CO5:	Develop software programs to control embedded system using Python Languages.

UNIT-I

Introduction to Embedded Electronic Systems and Microcontrollers:
An Embedded System-Definition, Embedded System Design and Development Life Cycle, An Introduction to Embedded system Architecture, The Embedded Systems Model, Embedded Hardware: The Embedded Board and the von Neumann Model, Embedded Processors: ISA Architecture Models, Internal Processor Design, Processor Performance, Board Memory: Read-Only Memory (ROM), Random-Access Memory (RAM), Auxiliary Memory, Memory Management of External Memory and Performance, Approaches to Embedded Systems, Small Microcontrollers, Anatomy of a Typical Small Microcontroller, Small Microcontrollers Memory, Embedded Software

UNIT-II

ARM Embedded Systems
The RISC Design Philosophy, The ARM Design Philosophy, Embedded System Hardware, Embedded System Software, ARM processor Families, Core extensions, Architecture Revisions.

UNIT-III

ARM Cortex-M3 processor: Applications, Programming model – Registers, Operation modes, Exceptions and Interrupts, Reset Sequence Instruction Set, Unified Assembler Language,
Memory Maps, Memory Access Attributes, Permissions, Bit-Band Operations, Unaligned and Exclusive Transfers. Pipeline, Bus Interfaces

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UNIT-IV
Embedded C Introduction to Embedded C - Difference between C & Embedded C - Programming style - Basic structure of C program- Keywords & Identifiers - Data type & its memory representation - Arrays and strings- Types of Operators - Bitwise Operators - Control Structures – Loops - Functions.

UNIT-V
Python Programming Basics of PYTHON Programming Syntax and Style – Python Objects– Dictionaries – comparison with C programming on Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.

Text Books:
1. Tammy Noergaard "Embedded Systems Architecture: A Comprehensive Guide for Engineers and Programmers", Elsevier (Singapore) Pvt. Ltd. Publications, 2005. 2. David. E. Simon, "An Embedded Software Primer", Pearson Education, 2001. 3. Rajkamal, "Embedded Systems: Architecture, Programming and Design", TMH Publications, Second Edition, 2008. 4. Joseph Yiu, "The definitive guide to ARM Cortex-M3", Elsevier, 2nd Edition
Reference Books:
1 Michael J Pont, "Embedded C", Pearson Education, 2007. 2. Jivan S. Parab, Vinod G. Shelake, Rajanish K.Kamot, and Gourish M.Naik, "Exploring C for Microcontrollers- A Hands on Approach", Springer, 2007. 3. Mark Lutz, "Learning Python Powerful OOPs",O'reilly,2011. 4. Peter Barry, Patrick Crowley, "Modern Embedded Computing" Morgan Kaufmann Publishers, 2012. 5. Sloss Andrew N, Symes Dominic, Wright Chris, "ARM System Developer's Guide: Designing and Optimizing", Morgan Kaufman Publication

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ANNEXURE - XI

Elective I
APPLICATION SPECIFIC INTEGRATED CIRCUITS (ASIC)
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Architect ASIC library design
CO2:	Develop programmable ASIC logic cells
CO3:	Design I/O cells and interconnects
CO4:	Identify new developments in SOC and low power design.
CO5:	design cell design

UNIT-I

Introduction to ASICs – Types of ASICs, Design flow, Economics of ASICs, ASIC Cell Libraries, CMOS Logic, CMOS Design Rules, Logic Cells, I/O Cells, Cell Compilers.

UNIT-II

ASIC Library Design – Transistors as resistors, Transistor Parasitic Capacitance, Logical Effort, Cell Design, Programmable ASICs, Programmable ASIC Logic Cells, Programmable ASIC I/O Cells, Programmable ASIC Interconnect, Programmable ASIC Design Software.

UNIT-III

Low-level Design Entry, Schematic Entry, Low-Level Design Languages, PLA Tools, EDIF, An overview of VHDL and Verilog, Logic Synthesis, Simulation. ASIC Construction, Floor Planning and Placement.

UNIT-IV

CMOS System Core Studies: Dynamic Warp Processors: Introduction, The Problem, The Algorithm, A Functional Overview, Detailed Functional Specification, Structural Floor Plan, Physical Design, Fabrication, Hierarchical Layout and Design Of Single Chip 32 Bit CPU: Introduction, Design Methodology, Technology Updatability And Layout Verification.

UNIT-V

Practical Realities and Ground Rules: Further Thoughts on Floor Plans/Layout, Floor Plan Layout of The Four Bit Processors, Input/output (I/O) Pads, "Real estate", Further Thoughts on System Delays, Ground Rules for Successful Design, Scaling of MOS Circuits.

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Text Books:
1.Application Specific Integrated Circuits by J.S. Smith, Addison Wesley, 1997.
Reference Books:
1.Basic VLSI Design : Systems and Circuits, Doublas A. Pucknell& Kamran Eshraghian, Prentice Hall of India Private Ltd., New Delhi, 1989. 2. VLSI Design Techniques for analog and digital circuits, R.L. Geiger, P.E. Allen & N.R. Streder, McGraw Hill Int. 1990.

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ANNEXURE - XII

Elective I
ADVANCED OPERATING SYSTEMS
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand the objectives of computer system architecture, instruction execution, I/O functions, memory hierarchy, and operating system.
CO2:	Apply basic commands, I/O redirection, filters, editors, and shell operations in a Unix/Linux environment.
CO3:	Understand the concept of system calls, process management, and inter-process communication techniques like pipes, semaphores, and sockets.
CO4:	Outline the goals, design issues, and communication models in distributed systems.
CO5:	Apply synchronization techniques and deadlock management strategies in distributed systems.

UNIT-I

Introduction to Operating Systems
Overview of computer system hardware, Instruction execution, I/O function, Interrupts, Memory hierarchy, I/O Communication techniques, Operating system objectives and functions, Evaluation of operating System.

UNIT-II

Introduction to UNIX and LINUX
Basic Commands & Command Arguments, Standard Input, Output, Input / Output Redirection, Filters and Editors, Shells and Operations.

UNIT-III

System Calls: System calls and related file structures, Input / Output, Process creation & termination.
Inter Process Communication: Introduction, File and record locking, Client – Server example, Pipes, FIFOs, Streams & Messages, Name Spaces, Systems V IPC, Message queues, Semaphores, Shared Memory, Sockets & TLI.

UNIT-IV

Introduction to Distributed Systems:
Goals of distributed system, Hardware and software concepts, Design issues.
Communication in Distributed Systems:
Layered protocols, ATM networks, Client - Server model, Remote procedure call and Group communication.

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UNIT-V
Synchronization in Distributed Systems: Clock synchronization, Mutual exclusion, E-tech algorithms, Bully algorithm, Ring algorithm, Atomic transactions **Deadlocks:** Dead lock in distributed systems, distributed dead lock prevention and distributed dead lock detection.

Text Books:
1.The Design of the UNIX Operating Systems – Maurice J. Bach, 1986, PHI. 2. Distributed Operating System - Andrew. S. Tanenbaum, 1994, PHI. 3. The Complete Reference LINUX – Richard Peterson, 4th Ed., McGraw – Hill.
Reference Books:
1.Operating Systems: Internal and Design Principles - Stallings, 6th Ed., PE. 2. Modern Operating Systems - Andrew S Tanenbaum, 3rd Ed., PE. 3. Operating System Principles - Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 7th Ed., John Wiley 4. UNIX User Guide – Ritchie & Yates. 5. UNIX Network Programming - W.Richard Stevens, 1998, PHI.

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ANNEXURE - XIII

Elective I
PARALLEL PROCESSING
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Outline the concepts of parallel processing and pipelining systems.
CO2:	Classify pipelining processors and illustrate advanced pipelining techniques.
CO3:	Build various architectures for VLIW processors.
CO4:	Make use of latency hiding techniques for implementing multithreaded processors
CO5:	Analyze parallel programming techniques and operating systems for multiprocessors customizing applications.

UNIT-I
Overview of Parallel Processing and Pipelining, Performance analysis, Scalability.

UNIT-II
Principles and implementation of Pipelining, Classification of pipelining processors, Advanced pipelining techniques, Software pipelining.

UNIT-III
VLIW processors Case study: Superscalar Architecture- Pentium, Intel Itanium Processor, Ultra PARC, MIPS on FPGA, Vector and Array Processor, FFT Multiprocessor Architecture.

UNIT-IV
Multithreaded Architecture, Multithreaded processors, Latency hiding techniques, Principles of Multithreading, Issues and solutions.

UNIT-V
Parallel Programming Techniques: Message passing program development, Synchronous and asynchronous message passing, Shared Memory Programming, Data Parallel Programming, Parallel Software Issues. Operating systems for multiprocessors systems Customizing applications on parallel processing platforms

Text Books:
1. Kai Hwang, Faye A. Briggs, "Computer Architecture and Parallel Processing", MGH International Edition

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2. Kai Hwang, "Advanced Computer Architecture", TMH
3. V. Rajaraman, L. Sivaram Murthy, "Parallel Computers", PHI.

Reference Books:

1. William Stallings, "Computer Organization and Architecture, Designing for performance "Prentice Hall, Sixth edition
2. Kai Hwang, ZhiweiXu, "Scalable Parallel Computing", MGH
3. David Harris and Sarah Harris, "Digital Design and Computer Architecture", Morgan

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ANNEXURE - XIV

Elective II
CPLD AND FPGA ARCHITECTURES AND APPLICATIONS
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand the features and architectures of industrial CPLDs with different families.
CO2:	Understand the features and architectures of industrial FPGAs with different families.
CO3:	Know the programming techniques used in FPGA design methodology.
CO4:	Design and implement complex real time digital circuits.
CO5:	Analyze the behavior of Integrated digital applications

UNIT-I

Introduction to Programmable Logic Devices

Introduction, Simple Programmable Logic Devices – Read Only Memories, Programmable Logic Arrays, Programmable Array Logic, Programmable Logic Devices/Generic Array Logic; Complex Programmable Logic Devices – Architecture of Xilinx Cool Runner XCR3064XL CPLD, CPLD Implementation of a Parallel Adder with Accumulation.

UNIT-II

Field Programmable Gate Arrays

Organization of FPGAs, FPGA Programming Technologies, Programmable Logic Block Architectures, Programmable Interconnects, Programmable I/O blocks in FPGAs, Dedicated Specialized Components of FPGAs, Applications of FPGAs.

UNIT-III

SRAM Programmable FPGAs

Introduction, Programming Technology, Device Architecture, The Xilinx XC2000, XC3000 and XC4000 Architectures.

UNIT-IV

Anti-Fuse Programmed FPGAs

Introduction, Programming Technology, Device Architecture, The Actel ACT1, ACT2 and ACT3 Architectures.

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UNIT-V
Design Applications General Design Issues, Counter Examples, A Fast Video Controller, A Position Tracker for a Robot Manipulator, A Fast DMA Controller, Designing Counters with ACT devices, Designing Adders and Accumulators with the ACT Architecture.

Text Books:
1. Field Programmable Gate Array Technology - Stephen M. Trimberger, Springer International Edition. 2. Digital Systems Design - Charles H. Roth Jr, Lizy Kurian John, Cengage Learning.
Reference Books:
1. Field Programmable Gate Arrays - John V. Oldfield, Richard C. Dorf, Wiley India. 2. Digital Design Using Field Programmable Gate Arrays - Pak K. Chan/Samiha Mourad, Pearson Low Price Edition. 3. Digital Systems Design with FPGAs and CPLDs - Ian Grout, Elsevier, Newnes. 4. FPGA based System Design - Wayne Wolf, Prentice Hall Modern Semiconductor Design Series.

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ANNEXURE - XV

Elective II
ELECTRONIC DESIGN AUTOMATION TOOLS
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Design software system models in a suitable system-level modeling language
CO2:	Make use of functional models into hardware and software components
CO3:	Construct models Using effective optimization techniques
CO4:	Compare the complexity and efficiency of various algorithms at high level and low level
CO5:	Analyze the behaviour of Mixed signal Digital Applications

UNIT-I

IMPORTANT CONCEPTS IN VERILOG:
Basics Of Verilog Language, Operators, Hierarchy, Procedures and Assignments, Timing Controls and Delay. Tasks And Functions Control Statements, Logic-Gate Modeling, Modeling Delay, Altering Parameters, other Verilog Features.

UNIT-II

SYNTHESIS AND SIMULATION USING HDLS:
Verilog And Logic Synthesis. VHDL And Logic Synthesis, Memory Synthesis, FSM Synthesis, Memory Synthesis, Performance-Driven Synthesis.
Simulation-Types of Simulation, Logic Systems Working of Logic Simulation, Cell Models, Delay Models State Timing Analysis, Formal Verification, Switch-Level Simulation Transistor-Level Simulation. CAD Tools For Synthesis and Simulation Model sim And Leonardo Spectrum (Exemplar).

UNIT-III

TOOLS FOR CIRCUIT DESIGN AND SIMULATION USING HSPICE:
HSPICE net list implementation,Hspice GUI for windows, DC and Operating point analysis,MOSFET behavioral modeling,Verilog-A modeule setup.

UNIT-IV

AN OVER VIEW OF MIXED SIGNAL VLSI DESIGN:
Fundamentals Of Analog and Digital Simulation, Mixed Signal Simulator Configurations, Understanding Modeling, Integration To CAE Environments, Analyses Of Analog Circuits Eg. A/D, D/A Converters, Up And Down Converters, Companders Etc.

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UNIT-V
TOOLS FOR LAYOUT IMPLEMENTATION: An overview of Schematic generation,DRC verification,LVS generation,PEX implementation,GDSII verification.

Text Books:
1. J.Bhaskar, A Verilog Primer, BSP, 2003. 2. J.Bhaskar, A Verilog HDL Synthesis BSP, 2003
Reference Books:
1. HSpice user guide simulation and Analysis 2. SABER: Technical Reference Manual, Analogy Nic, USA. 3. M.J.S.SMITH :Aplication-Specific Integrated Circuits(1997). Addison Wesley 4. "Digital VLSI Systems Design: A Design Manual for Implementation of Projects on FPGAs and ASICs Using Verilog" by Seetharaman Ramachandra.

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ANNEXURE - XVI

Elective II
DIGITAL SYSTEM DESIGN
I Year M. Tech. I semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Apply CAMP algorithm for minimization of switching functions
CO2:	Make use of IISc and Compact algorithms in the development of minimized PLAs
CO3:	Develop Programmable Logic Devices using ASM charts
CO4:	Analyze various techniques for fault diagnosis in combinational circuits
CO5:	Analyze various techniques for fault diagnosis in sequential circuits

UNIT-I

Minimization Procedures and CAMP Algorithm

Review on minimization of switching functions using tabular methods, k-map, QM algorithm, CAMP-I algorithm, Phase-I: Determination of Adjacencies, DA, CSC, SSMs and EPCs,, CAMPI algorithm, Phase-II: Passport checking, Determination of SPC, CAMP-II algorithm: Determination of solution cube, Cube based operations, determination of selected cubes are wholly within the given switching function or not, Introduction to cube based algorithms.

UNIT-II

PLA Design, PLA Minimization and Folding Algorithms

Introduction to PLDs, basic configurations and advantages of PLDs, PLA-Introduction, Block diagram of PLA, size of PLA, PLA design aspects, PLA minimization algorithm (IISc algorithm), PLA folding algorithm (COMPACT algorithm)-Illustration of algorithms with suitable examples.

UNIT-III

Design of Large-Scale Digital Systems

Algorithmic state machine charts-Introduction, Derivation of SM Charts, Realization of SM Chart, control implementation, control unit design, data processor design, ROM design, PAL design aspects, digital system design approaches using CPLDs, FPGAs and ASICs.

UNIT-IV

Fault Diagnosis in Combinational Circuits

Faults classes and models, fault diagnosis and testing, fault detection test, test generation, testing process, obtaining a minimal complete test set, circuit under test methods- Path sensitization method, Boolean difference method, properties of Boolean differences, Kohavi algorithm, faults in PLAs, DFT schemes, built in self-test.

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UNIT-V
Fault Diagnosis in Sequential Circuits Fault detection and location in sequential circuits, circuit test approach, initial state identification, Haming experiments, synchronizing experiments, machine identification, distinguishing experiment, adaptive distinguishing experiments.

Text Books:
1. Logic Design Theory-N. N. Biswas, PHI 2. Switching and Finite Automata Theory-Z. Kohavi , 2nd Edition, 2001, TMH 3. Digital system Design using PLDd-Lala
Reference Books:
1. Fundamentals of Logic Design – Charles H. Roth, 5th Ed., Cengage Learning. 2. Digital Systems Testing and Testable Design – Miron Abramovici, Melvin A.Breuer and Arthur D. Friedman- John Wiley & Sons Inc.

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ANNEXURE - XVII

ANALOG AND DIGITAL CMOS VLSI DESIGN LAB

I Year M. Tech. I semester

(Branch: VLSI Design & Embedded Systems)

L	T	P	C
0	0	3	1.5

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Develop different Analog Applications
CO2:	Analyze the functional behaviour of analog circuits and determine performance metrics
CO3:	Develop different digital Applications
CO4:	Analyze the functional behaviour of digital circuits and determine performance metrics
CO5:	Construct layout and GDSII implementation of digital circuits

The students are required to design and implement the Circuit and Layout of any **TEN** Experiments using CMOS 130nm Technology with Mentor Graphics Tool/Cadence/ Synopsys/Industry Equivalent Standard Software.

List of Experiments:

1. MOS Device Characterization and parametric analysis
2. Common Source Amplifier
3. Cascode amplifier
4. Cascode current mirror.
5. Wilson current mirror.
6. Full Adder
7. RS-Latch
8. Clock Divider
9. JK-Flip Flop
10. Synchronous Counter
11. Asynchronous Counter
12. Static RAM Cell

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ANNEXURE - XVIII

EMBEDDED SYSTEMS DESIGN LAB

I Year M. Tech. I semester

(Branch: VLSI Design & Embedded Systems)

L	T	P	C
0	0	3	1.5

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Develop and execute Assembly Language Programs for arithmetic and bit manipulation on ARM Cortex M3.
CO2:	Interface and control hardware components like motors and DACs using Embedded C on an ARM Cortex M3 evaluation board.
CO3:	Utilize UART for serial communication and message display in Embedded C on ARM Cortex M3.
CO4:	Implement external interrupts to control LEDs and other outputs using Embedded C.
CO5:	Interface with sensors and read data using SPI ADC ICs on an ARM Cortex M3 evaluation board.

PART-A:

(Conduct the following experiments by writing Assembly Language Program (ALP) using ARM Cortex M3 Registers using an evaluation board/simulator and the required software tool.)

1. ALP to multiply two 16-bit binary numbers.
2. ALP to find the sum of first 10 integers.
3. ALP to find the number of 0's and 1's in a 32-bit data.
4. ALP to determine the given 16-bit number is ODD or EVEN.
5. ALP to write data in RAM.

PART-B:

(Conduct any **Five** experiments on an ARM CORTEX M3 evaluation board using evaluation version of Embedded 'C' &Keil Uvision-4tool/compiler.)

6. Display "Hello World" message using Internal UART.
7. Interface and Control a DC Motor.
8. Interface a Stepper motor and rotate it in clockwise and anti-clockwise direction.
9. Interface a DAC and generate Triangular and Square waveforms.
10. Interface a 4x4 keyboard and display the key code on an LCD.
11. Demonstrate the use of an external interrupt to toggle an LED On/Off.
12. Display the Hex digits 0 to F on a 7-segment LED interface, with an appropriate delay in between.
13. Measure Ambient temperature using a sensor and SPI ADC IC.

Beyond Syllabus:

1. Using the Internal PWM module of ARM controller generate PWM and vary its duty cycle.
2. Interface a simple Switch and display its status through Relay, Buzzer and LED.

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ANNEXURE - XIX

RTL DESIGN & VERIFICATION USING SYSTEM VERILOG

I Year M. Tech. II semester

(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand the importance of System Verilog
CO2:	Develop conditional constructs based digital applications using System Verilog
CO3:	Develop object oriented Programming(OOP) based digital applications
CO4:	Develop digital Applications using System Verilog
CO5:	Analyze functional coverage using System Verilog

UNIT-I

Introduction to System Verilog

Concepts of top-down design, Overview of RTL models, Overview of gate/switch models, The RTL design flow with simulation and synthesis, writing verification test benches in Verilog, running your preferred Verilog simulator, Debugging designs with simulation. Identifier names, Logic values and numbers, Data types and 2-state vs. 4-state guidelines, Enumerated types, User-defined types, Casting (Static and Dynamic). Structure and unions declarations and their element access. Dynamic arrays, Associative arrays, Queues and Strings

UNIT-II

System Verilog Interfaces, Packages and Compound types

Using interfaces to simplify inter-module connections, Mod ports in Interface, Clocking Blocking in interface, Transforming Verilog code into System Verilog using package, interface mod port and clocking block, Using tasks and functions in interfaces, Interfaces as an RTL modelling construct, Package declaration, Element access in package. System Verilog test bench using basic constructs, Program and Final block.

UNIT-III

System Verilog Procedural blocks and Assignments:

Procedural blocks, System Verilog enhanced procedural blocks, Blocking and non- blocking assignments, Continuous assignments, Programming statements – if else, case, case X, case Z, unique if, priority if, unique case, priority case. Operators and language rules, Loops: forever, for each, repeat, while do while and for loop.

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UNIT-IV

System Verilog Process Synchronization and OOPS

Fork—join variants for dynamic processes, Built-in mailbox classes, Built-in semaphore classes, Enhanced event data types, Test bench using mailbox, semaphores and event. System Verilog's class data type, defining class objects, Class methods, Class inheritance, Aggregate class, Abstraction class, Polymorphism, Virtual methods, Virtual classes, Public and private classes, Extending class definitions (inheritance), Virtual methods, Virtual classes, Public and private classes.

UNIT-V

System Verilog Constrained Random Value Generation, Functional Coverage and Assertions

Built-in System Verilog random classes, defining constrained random values, constrained random verification methodologies, system Verilog code coverage and functional coverage, Defining and constructing cover groups, Defining cover points and coverage bins, Coverage sampling, Cross coverage. Assertion concepts, Immediate and concurrent assertions, Assertion sequence definitions Testbench using constrained randomization, coverage. and Assertions

Text Books: 1."SystemVerilog for Design: A Guide to Using SystemVerilog for Hardware Design and Modeling" by Sutherland, Davidmann, and Flake.
2. "SystemVerilog Assertions and Functional Coverage: Guide to Language, Methodology and Applications" by Bergeron, Cerny, Hunter, and Nightingale

Reference Books:

1. "SystemVerilog Assertions Handbook: 2nd Edition" by Ben Cohen, Srinivasan Venkataramanan, and Ajeetha Kumari.
2. "SystemVerilog for Verification: A Guide to Learning the Testbench Language Features" by Chris Spear.
3. "A Practical Guide to Adopting the Universal Verification Methodology (UVM)" by Matt Rahl and Kathleen Meade.
4. "SystemVerilog Assertions Handbook: 4th Edition" by Ben Cohen, Srinivasan Venkataramanan, and Ajeetha Kumari.
5.SystemVerilog Unleashed" by Edmond Leung.
6. "SystemVerilog for Verification: A Guide to Learning the Testbench Language Features" by Chris Spear and Greg Tumbush.
7. "SystemVerilog for Verification: A Guide to Learning the Testbench Language Features" by Chris Spear, Greg Tumbush, and Cliff Cummings.

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ANNEXURE - XX

INTERNET OF THINGS AND ITS APPLICATIONS
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art Internet of things
CO2:	Identify the architecture and infrastructure of IoT.
CO3:	Choose the appropriate technologies, algorithms, and approaches for the related issues.
CO4:	Identify problems, and explain, analyze, and evaluate various IoT solutions
CO5:	Explain the core issues of IoT such as security, privacy, and interoperability

UNIT-I

THE IoT NETWORKING CORE

History of IoT, Review of Technologies involved in IoT Development, Internet/Web and Networking Basics -OSI Model, Data transfer referred with OSI Model, IP Addressing, Point to Point Data transfer, Point to Multi Point Data transfer & Network Topologies, Sub-netting, Network Topologies referred with Web, Introduction to Web Servers, Introduction to Cloud Computing. Basics of Big Data, Data Science.

UNIT-II

IoT Architecture:
M2M – Machine to Machine, Web of Things, IoT protocols, Introduction to wireless and mobile networks, ZigBee, BLE mesh, WiFi, MQTT, LoRa-Machine Applications: Remote Monitoring & Sensing, Remote Controlling, Performance Analysis.

The Architecture
The Layering concepts , IoT Communication Pattern, IoT protocol Architecture, The 6LoWPAN
Security aspects in IoT

UNIT-III

IoT Platform overview
Overview of IoT supported Hardware platforms such as: Raspberry pi, ARM Cortex Processors, Arduino and Intel Galileo boards.

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Overview and working principle of Wired Networking equipment's – Router, Switches, Overview and working principle of Wireless Networking equipment's – Access Points, Hubs etc. Linux Network configuration Concepts: Networking configurations in Linux Accessing Hardware & Device Files interactions.

UNIT-IV

IoT Application Development:

Application Protocols

MQTT, REST/HTTP, CoAP, MySQL

Back-end Application Designing

Apache for handling HTTP Requests, PHP & MySQL for data processing, MongoDB Object type Database, HTML, CSS & jQuery for UI Designing, JSON lib for data processing, Security & Privacy during development, Application Development for mobile Platforms: Overview of Android / IOS App Development tools.

UNIT-V

CASE STUDIES/INDUSTRIAL APPLICATIONS

IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipment's. Use of Big Data and Visualization in IoT, Industry 4.0 concepts.

Text Books:

1. Jean-Philippe Vasseur, Adam Dunkels, "Interconnecting Smart Objects with IP: The Next Internet", Morgan Kuffmann-2010
2. Vijay Madisetti , ArshdeepBahga, : Internet of Things (A Hands-on-Approach)" -2014
3. Adrian McEwen (Author), Hakim Cassimally, "Designing the Internet of Things" ,Wiley - 2013
4. Dr. OvidiuVermesan, Dr. Peter Friess, "Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems," River Publishers -2013

Reference Books:

1. Barrie Sosinsky, "Cloud Computing Bible", Wiley-India, 2010
2. Asoke K Talukder and Roopa R Yavagal, "Mobile Computing," Tata McGraw Hill, 2010.
3. Adelstein and S.K.S. Gupta, "Fundamentals of Mobile and Pervasive Computing," McGraw Hill, 2009
4. Ronald L. Krutz, Russell Dean Vines "Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley-India, 2010

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ANNEXURE - XXI

Elective III
LOW POWER VLSI DESIGN
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Illustrate the necessity of low power VLSI, Sources of power dissipation techniques and importance of Short-Channel effects
CO2:	Explain the concepts of Low-Power Design Approaches
CO3:	Analyze Low-Voltage Low-Power Adder Circuits
CO4:	Apply Low Power Design concept to Different Multiplier circuits
CO5:	Classify and Compare Low-Voltage Low-Power Memories

UNIT-I

Fundamentals of Low Power VLSI Design

Need for Low Power Circuit Design, Sources of Power Dissipation – Switching Power Dissipation, Short Circuit Power Dissipation, Leakage Power Dissipation, Glitching Power Dissipation, Short Channel Effects –Drain Induced Barrier Lowering and Punch Through, Surface Scattering, Velocity Saturation, Impact Ionization, Hot Electron Effect.

UNIT-II

Low-Power Design Approaches

Low-Power Design through Voltage Scaling – VTCMOS circuits, MTCMOS circuits, Architectural Level Approach –Pipelining and Parallel Processing Approaches.

Switched Capacitance Minimization Approaches

System Level Measures, Circuit Level Measures, Mask level Measures.

UNIT-III

Low-Voltage Low-Power Adders

Introduction, Standard Adder Cells, CMOS Adder's Architectures – Ripple Carry Adders, Carry Look-Ahead Adders, Carry Select Adders, Carry Save Adders, Low-Voltage Low-Power Design Techniques –Trends of Technology and Power Supply Voltage, Low-Voltage Low-Power Logic Styles.

UNIT-IV

Low-Voltage Low-Power Multipliers

Introduction, Overview of Multiplication, Types of Multiplier Architectures, Braun Multiplier, Baugh-Wooley Multiplier, Booth Multiplier, Introduction to Wallace Tree Multiplier.

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UNIT-V
Low-Voltage Low-Power Memories Basics of ROM, Low-Power ROM Technology, Future Trend and Development of ROMs, Basics of SRAM, Memory Cell, Precharge and Equalization Circuit, Low-Power SRAM Technologies, Basics of DRAM, Self-Refresh Circuit, Future Trend and Development of DRAM.

Text Books:
1. CMOS Digital Integrated Circuits – Analysis and Design – Sung-Mo Kang, Yusuf Leblebici, TMH, 2011. 2. Low-Voltage, Low-Power VLSI Subsystems – Kiat-Seng Yeo, Kaushik Roy, TMH Professional Engineering.
Reference Books:
1. Low Power CMOS Design – Anantha Chandrakasan, IEEE Press/Wiley International, 1998. 2. Low Power CMOS VLSI Circuit Design – Kaushik Roy, Sharat C. Prasad, John Wiley & Sons, 2000. 3. Practical Low Power Digital VLSI Design – Gary K. Yeap, Kluwer Academic Press, 2002. 4. Low Power CMOS VLSI Circuit Design – A. Bellamour, M. I. Elamasri, Kluwer Academic Press, 1995.

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ANNEXURE - XXII

Elective III
SYSTEM ON CHIP DESIGN
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Illustrate System on Chip design architecture, Memory and Addressing
CO2:	Compare different processor architectures like VLIW and Superscalar
CO3:	Build SOC Memory system design, Types of cache and Memory interaction
CO4:	Analyze interconnect architectures and Reconfiguration technologies
CO5:	Examine different SOC design application case studies

UNIT-I

Introduction to the System Approach

System Architecture, Components of the system, Hardware & Software, Processor Architectures, Memory and Addressing. System level interconnection, An approach for SOC Design, System Architecture and Complexity.

UNIT-II

Processors

Introduction, Processor Selection for SOC, Basic concepts in Processor Architecture, Basic concepts in Processor Micro Architecture, Basic elements in Instruction handling. Buffers: minimizing Pipeline Delays, Branches, More Robust Processors, Vector Processors and Vector Instructions extensions, VLIW Processors, Superscalar Processors.

UNIT-III

Memory Design for SOC

Overview of SOC external memory, Internal Memory, Size, Scratchpads and Cache memory, Cache Organization, Cache data, Write Policies, Strategies for line replacement at miss time, Types of Cache, Split – I, and D – Caches, Multilevel Caches, Virtual to real translation, SOC Memory System, Models of Simple Processor – memory interaction.

UNIT-IV

Interconnect Customization and Configuration

Inter Connect Architectures, Bus: Basic Architectures, SOC Standard Buses, Analytic Bus Models, Using the Bus model, Effects of Bus transactions and contention time. SOC Customization: An overview, Customizing Instruction Processor, Reconfiguration Technologies, Mapping design onto Reconfigurable devices, Instance- Specific design, Customizable Soft Processor, Reconfiguration - overhead analysis and trade-off analysis on reconfigurable Parallelism.

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UNIT-V
Application Studies / Case Studies SOC Design approach, AES algorithms, Design and evaluation, Image compression – JPEG compression.

Text Books:
1. Computer System Design System-on-Chip - Michael J. Flynn and Wayne Luk, Wiely India Pvt. Ltd. 2. ARM System on Chip Architecture – Steve Furber –2nd Ed., 2000, Addison Wesley Professional.
Reference Books:
1. Design of System on a Chip: Devices and Components – Ricardo Reis, 1st Ed., 2004, Springer 2. Co-Verification of Hardware and Software for ARM System on Chip Design (Embedded Technology) – Jason Andrews – Newnes, BK and CDROM. 3. System on Chip Verification – Methodologies and Techniques –Prakash Rashinkar, Peter Paterson and Leena Singh L, 2001, Kluwer Academic Publishers.

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ANNEXURE - XXIII

Elective III
DIGITAL SIGNAL AND IMAGE PROCESSING
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Analyze discrete-time signals and systems in various domains (i.e Time, Z and Fourier)
CO2:	Design the digital filters (both IIR and FIR) from the given specifications
CO3:	Analyze the quantization effects in digital filters and understand the basics of image sampling, quantization and image transforms.
CO4:	Understand the concepts of image enhancement, image restoration and image segmentation.
CO5:	Know the various methods involved in image compression and fundamentals in color image processing.

UNIT-I
Review of Discrete Time signals and systems, Characterization in time, Z and Fourier domain, Fast Fourier Transform using Decimation In Time (DIT) and Decimation In Frequency (DIF) Algorithms.

UNIT-II
IIR Digital Filters: Introduction, Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters using Impulse Invariance, Bilinear Transformation methods. **FIR Digital Filters:** Introduction, Design of FIR Digital Filters using Window Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT-III
Analysis Of Finite Word length Effects: The Quantization Process and Errors, Quantization of Fixed-Point Numbers, Quantization of Floating-Point Numbers, Analysis of Coefficient Quantization effects. **Introduction To Digital Image Processing:** Introduction, components in image processing system, Applications of Digital image processing, Image sensing and acquisition, Image sampling, Quantization, Basic Relationships between pixels, Image Transforms: 2D-DFT, DCT, Haar Transform.

UNIT-IV
Image Enhancement: Intensity transformation functions, histogram processing, fundamentals of spatial filtering, smoothing spatial filters, sharpening spatial filters, the basics of filtering in

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the frequency domain, image smoothing using frequency domain filters, Image Sharpening using frequency domain filters, Selective filtering.
Image Restoration: Introduction, restoration in the presence of noise only-Spatial Filtering, Periodic Noise Reduction by frequency domain filtering, Linear, Position –Invariant Degradations, Estimating the degradation function, Inverse filtering, Minimum mean square error (Wiener) filtering.
Image Segmentation: Fundamentals, point, line, edge detection, thresholding, region based segmentation.

UNIT-V

Image Compression: Fundamentals, Basic compression methods: Huffman coding, Arithmetic coding, Run-Length coding, Block Transform coding, Predictive coding, Wavelet coding.
Color Image Processing: color fundamentals, color models, pseudo color image processing, basics of full color image processing, color transformations, smoothing and sharpening. Image segmentation based on color, noise in color images, color image compression.

Text Books:

1. Digital Signal Processing, Principles, Algorithms, and Applications: John G. Proakis, Dimitris G.Manolakis, Pearson Education/PHI,2007.
2. S. K. Mitra. "Digital Signal Processing – A Computer based Approach", TMH, 3rd Edition,2006 3. Rafael C.Gonzalez and Richard E. Woods, "Digital Image Processing", Pearson Education, 2011.
4. S.Jayaraman, S.Esakkirajan, T.Veerakumar, "Digital Image Processing", Mc Graw Hill Publishers, 2009

Reference Books:

1. Digital Signal Processing: Andreas Antoniou, TATA McGraw Hill , 2006
2. Digital Signal Processing: MH Hayes, Schaum's Outlines, TATA Mc-Graw Hill, 2007.
3. Anil K. Jain, "Fundamentals of Digital Image Processing," Prentice Hall of India, 2012.

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ANNEXURE - XXIV

Elective IV
COMMUNICATION BUSES AND INTERFACES
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Compare serial buses like RS232, RS485, I2C, and SPI in terms of data rates, features, limitations, and applications.
CO2:	Understand CAN architecture, including ISO 11898 standards, data transmission, frame formats, and application layers.
CO3:	Outline PCIe revisions, configuration space, bus enumeration, hardware/software implementation, protocols, and applications.
CO4:	Understand USB transfer types, enumeration states, descriptor types, and device drivers.
CO5:	Learn about SFPDP configurations, flow control, and serial data transmission over fiber and copper cables.

UNIT-I
Serial Busses- Cables, Serial busses, serial versus parallel, Data and Control Signal- data frame, data rate, features Limitations and applications of RS232, RS485, I2C, SPI

UNIT-II
CAN **ARCHITECTURE**- ISO 11898-2, ISO 11898-3, Data Transmission- ID allocation, Bit timing, Layers- Application layers, Object layer, Transfer layer, Physical layer, Frame formats- Data frame, Remote frame, Error frame, Over load frame, Ack slot, Inter frame spacing, Bit spacing, Applications.

UNIT-III
PCIe Revision, Configuration space- configuration mechanism, Standardized registers, Bus enumeration, Hardware and Software implementation, Hardware protocols, Applications.

UNIT-IV
USB Transfer Types- Control transfers, Bulk transfer, Interrupt transfer, Isochronous transfer. Enumeration- Device detection, Default state, addressed state, Configured state, enumeration sequencing. Descriptor types and contents- Device descriptor, configuration descriptor, Interface descriptor, Endpoint descriptor, String descriptor. Device driver.

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UNIT-V
Data streaming Serial Communication Protocol- Serial Front Panel Data Port (SFPDP) configurations, Flow control, serial FPDP transmission frames, fiber frames and copper cable.

Text Books:
1. A Comprehensive Guide to controller Area Network – Wilfried Voss, Copperhill Media Corporation, 2nd Ed., 2005. 2. Serial Port Complete-COM Ports, USB Virtual Com Ports and Ports for Embedded Systems- Jan Axelson, Lakeview Research, 2nd Ed.,
Reference Books:
1. USB Complete – Jan Axelson, Penram Publications. 2. PCI Express Technology – Mike Jackson, Ravi Budruk, Mindshare Press.

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ANNEXURE - XXV

Elective IV
DESIGN FOR TESTABILITY
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Outline the testing process and fault modelling
CO2:	Analyze different algorithms for true value and fault simulation
CO3:	Test circuits for SCOAP measures and list various scan design methods
CO4:	Analyze BIST process and types of BISTs
CO5:	Analyze fault coverage using ATPG techniques

UNIT-I

Introduction to Testing
Testing Philosophy, Role of Testing, Digital and Analog VLSI Testing, VLSI Technology Trends affecting Testing, Types of Testing, Fault Modeling: Defects, Errors and Faults, Functional Versus Structural Testing, Levels of Fault Models, Single Stuck-at Fault.

UNIT-II

Logic and Fault Simulation
Simulation for Design Verification and Test Evaluation, Modeling Circuits for Simulation, Algorithms for True-value Simulation, Algorithms for Fault Simulation.

UNIT-III

Testability Measures
SCOAP Controllability and Observability, High Level Testability Measures, Digital DFT and Scan Design: Ad-Hoc DFT Methods, Scan Design, Partial-Scan Design, Variations of Scan.

UNIT-IV

Built-In Self-Test
The Economic Case for BIST, Random Logic BIST: Definitions, BIST Process, Pattern Generation, Response Compaction, Built-In Logic Block Observers, Test-Per-Clock, Test-Per-Scan BIST Systems, Circular Self Test Path System, Memory BIST, Delay Fault BIST.

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UNIT-V
ATPG Single stuck at fault, Fault collapsing, ATPG Algorithm and Tetra-max tool flow,Fault models,Single stuck at operation,Delay fault model,Bridge Fault models,ATPG models, Fault classes,ATPG effectiveness,ATPG modes,Coverge and improvement techniques

Text Books:
1. Essentials of Electronic Testing for Digital, Memory and Mixed Signal VLSI Circuits - M.L. Bushnell, V. D. Agrawal, Kluwer Academic Publishers.
Reference Books:
1. Digital Systems and Testable Design - M. Abramovici, M.A.Breuer and A.D Friedman, Jaico Publishing House. 2. Digital Circuits Testing and Testability - P.K. Lala, Academic Press.

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ANNEXURE - XXVI

Elective IV
DSP PROCESSORS AND ARCHITECTURES
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
3	0	0	3

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand DSP fundamentals and analyze computational accuracy and error sources in DSP implementations.
CO2:	Outline the basic architecture, computational blocks, memory, and external interfacing features of programmable DSP devices.
CO3:	Learn about the TMS320C54XX DSP's architecture, memory, instructions, peripherals, interrupts, and pipeline operation.
CO4:	Examine the Analog Devices DSP family, including ALU/MAC blocks, ADSP 2100, ADSP-2181, and Blackfin processor architecture.
CO5:	Analyze memory space organization, external bus interfacing, I/O methods, and DMA in programmable DSP devices.

UNIT-I

Introduction to Digital Signal Processing

Introduction, a Digital signal-processing system, the sampling process, discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and interpolation.

Computational Accuracy in DSP Implementations

Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT-II

Architectures for Programmable DSP Devices

Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation UNIT, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT-III

Programmable Digital Signal Processors

Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX Instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX Processors, Pipeline Operation of TMS320C54XX Processors.

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UNIT-IV
Analog Devices Family of DSP Devices Analog Devices Family of DSP Devices – ALU and MAC block diagram, Shifter Instruction, Base Architecture of ADSP 2100, ADSP-2181 high performance Processor. Introduction to Black fin Processor - The Black fin Processor, Introduction to Micro Signal Architecture, Overview of Hardware Processing Units and Register files, Address Arithmetic Unit, Control Unit, Bus Architecture and Memory, Basic Peripherals.

UNIT-V
Interfacing Memory and I/O Peripherals to Programmable DSP Devices Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA).

Text Books:
1. Digital Signal Processing – Avtar Singh and S. Srinivasan, Thomson Publications, 2004. 2. A Practical Approach To Digital Signal Processing - K Padmanabhan, R. Vijaya rajeswaran, Ananthi. S, New Age International, 2006/2009 3. Embedded Signal Processing with the Micro Signal Architecture: Woon-Seng Gan, Sen M. Kuo, Wiley-IEEE Press, 2007
Reference Books:
1. Digital Signal Processors, Architecture, Programming and Applications-B. Venkataramani and M. Bhaskar, 2002, TMH. 2. DSP Processor Fundamentals, Architectures & Features – Lapsley et al. 2000, S. Chand & Co. 3. Digital Signal Processing Applications Using the ADSP-2100 Family by The Applications Engineering Staff of Analog Devices, DSP Division, Edited by Amy Mar, PHI 4. The Scientist and Engineer's Guide to Digital Signal Processing by Steven W. Smith, Ph.D., California Technical Publishing, ISBN 0-9660176-3-3, 1997.

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ANNEXURE - XXVII

RTL DESIGN & VERIFICATION USING SYSTEM VERILOG LAB

I Year M. Tech. II semester

(Branch: VLSI Design & Embedded Systems)

L	T	P	C
0	0	3	1.5

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Implementation of FSMs using System Verilog
CO2:	Transform Verilog RTL code to System verilog
CO3:	Design and Verify combinational digital applications using System Verilog
CO4:	Develop FIFO using conditional constructs
CO5:	Analyze the functional coverage for digital applications

List of Experiments:

1) Perform the following functions using System verilog
   a) Test all the 2-state and 4-state Data types.
   b) Design a 1010, 1011, 1110, and 1111 overlapped finite sequence, use enumerated data type, user defined data type and verify using system Verilog test-bench
   c) Declare structure and union, assign different values to the elements of structure and union, access the variables of the elements of the structure and unions using test-bench.
   d) Declare different arrays, assign values and test different access methods using test-bench.
   e) Declare a queue, assign values and test different access methods using test-bench.
2) Transform a Verilog RTL code to System Verilog code using packages, user defined data types, interface, mod port, clocking blocks.
3) Declare a program block and final block in a test-bench.
4) Design and verify the fixed priority arbiters using the following
   i) If – else
   ii) Case
   iii) Priority If
   iv) Priority Case

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5) Design and verify generic decoder using the following
   i) If – else
   ii) Case
   iii) Priority If
   iv) Priority Case
6) Design a Fibonacci series using loops and verify the same using test bench
7) Implementation of Priority based scheduler using System Verilog
8) Develop System-on-Chip (SoC) architecture
9) Develop a FIFO using the object-oriented programming
   i. Usage of Encapsulation and inheritance.
   ii. Modify the above developed test-bench using polymorphism.
10) Pick a scenario for each assertion type and execute.
   a. Modify the above test-bench to increase the functional coverage by using constrained random generation.
   b. Modify the above test-bench by writing specific assertions to enhance coverage further

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ANNEXURE - XXVIII

INTERNET OF THINGS AND ITS APPLICATIONS LAB
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
0	0	3	1.5

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Understand Arduino, Node MCU, Raspberry Pi, and cloud services like Thingspeak and Blynk.
CO2:	Interface with ESP8266/Raspberry Pi to control LED blinking, switching, and intensity using PWM.
CO3:	Transmit LED and ultrasonic sensor data to cloud services via ESP8266/Raspberry Pi.
CO4:	Develop IoT projects such as temperature/humidity loggers and automatic plant watering systems.
CO5:	Create remote control systems for street lights and motion detectors with email notifications.

List of Experiments

1. Introduction to Arduino, Node MCU, Raspberry Pi and Cloud Service (Thingspeak, Blynk, …)
2. Blinking an LED by interfacing with ESP8266 / Raspberry Pi
3. Controlling an LED with a switch by interfacing with ESP8266 / Raspberry Pi
4. Change intensity of an LED using PWM by interfacing with ESP8266 / Raspberry Pi
5. Send LED status to a Cloud Service by interfacing with ESP8266 / Raspberry Pi
6. Send Ultrasonic Sensor Status to a Cloud Service by interfacing with ESP8266 / Raspberry Pi
7. IoT based Motor control by interfacing with ESP8266 / Raspberry Pi

Mini Projects

1. IoT based Temperature and Humidity logger using any Cloud Service
2. Remote Monitoring and Automatic Control of Street Lights
3. IoT based Automatic Plant Watering System
4. IoT based Motion detector with email Notification

Additional Experiments

1. Publishing sensor data to Google Spreadsheets
2. Photo capture and video streaming using Raspberry Pi

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ANNEXURE - XXIX

MINI PROJECT WITH SEMINAR
I Year M. Tech. II semester
(Branch: VLSI Design & Embedded Systems)

L	T	P	C
0	0	4	2

Course Outcomes: At the end of the Course, the student shall be able to	
CO1:	Learn new concepts and apply them to the solution of engineering problems
CO2:	Demonstrate the skills for performing literature survey, identify gaps, analyze the technical content
CO3:	Formulate and conduct experiments and utilize modern tools for developing working models / process / system
CO4:	Clearly communicate their ideas in writing and prepare a well-documented report
CO5:	Create informative PPTs and clearly communicate their ideas orally demonstrating technical knowledge

Syllabus Contents

The students are required to search / gather the material / information on a specific a topic comprehend it and present / discuss in the class.

Evaluation of Mini Project

- For Mini Project with Seminar, a student under the supervision of a faculty member, shall collect the literature on a topic and critically review the literature and submit it to the department in a report form.
- The student shall make an oral presentation before the Project Review Committee consisting of Head of the Department, supervisor/mentor and two other senior faculty members of the department.
- For Mini Project with Seminar, there will be only internal evaluation of 100 marks. A candidate has to secure a minimum of 50% of marks to be declared successful.

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HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM

Detailed Syllabus for M.Tech – VLSI Design & Embedded Systems - First Semester

RESEARCH METHODOLOGY AND IPR

Instruction: 3Periods/week	**Time: 3 Hours**	**Credits: 2**
Internal: 30Marks	**External: 70 Marks**	**Total: 100Marks**

Unit 1: Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

Unit 2: Effective literature studies approaches, analysis Plagiarism, Research ethics,

Unit 3: Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

Unit 4: Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

Unit 5: Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.

Unit 6: New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

References:

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science& engineering students"
2. Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
3. Ranjit Kumar, 2 ndEdition, "Research Methodology: A Step by Step Guide for beginners"
4. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd,2007.
5. Mayall, "Industrial Design", McGraw Hill, 1992.
6. Niebel, "Product Design", McGraw Hill, 1974.
7. Asimov, "Introduction to Design", Prentice Hall, 1962.
8. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.
9. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008

3/8/2024

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PRINCIPAL
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Visakhapatnam

Audit Course
Organizational Behavior

M. Tech- VLSI Design and Embedded Systems

I -Semester	**Subject Code:**	**Instruction: 3 Periods/week**
Credits: 3	**Internal: 100 Marks**	**Total: 100 Marks**

Unit 1: Organizational Behavior

Concept of Organization - Concept of Organizational Behavior - Nature of Organizational Behavior - Role of Organizational behavior - Disciplines contributing to Organizational Behavior.

Unit 2: Motivation

Definition - Nature of Motivation - Role of Motivation - Theories of Motivation: Maslow's Need Hierarchy Theory, Herzberg's Motivation Hygiene Theory and McGregor's Theory X and Theory Y.

Unit 3: Group Dynamics

Meaning - Concept of Group - Types of groups -Formal and Informal groups - Group development - Group cohesiveness and factors affecting group cohesiveness

Unit 4: Leadership

Concept of Leadership - Difference between Leadership and Management - Importance of Leadership - Leadership styles: Autocratic leadership, Participative leadership and Free Rein leadership.

Unit 5: Communication

Meaning - Communication Process - Forms of communication: Oral, Written and Non- Verbal communication - Direction of communication: Downward, Upward and Horizontal communication.

Unit 6: Organizational conflicts

Concept of conflict - Reasons for conflict - Types of Conflict: Intrapersonal conflict, Interpersonal conflict, Intragroup conflict, Intergroup conflict, Inter organizational conflict - Conflict management.

Unit 7: Organizational Change

Nature - Factors in Organizational change -Planned change: Process of planned change - Resistance to change: Factors in resistance to change – Overcoming resistance to change.

Text Books:

1. L.M.Prasad: Organizational Behavior, Sultan Chand & Sons, New Delhi -110002.

Reference Books:

1. K. Aswathappa: Organizational Behavior, Himalaya Publishing House, New Delhi.
2. Stephen Robbins: Organizational Behavior, Pearsons Education, New Delhi.

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Audit Course

ENTREPRENEURSHIP

M. Tech-VLSI Design and Embedded Systems

II- Semester	**Subject Code:**	**Instruction: 3 Periods/week**
Credits: 3	**Internal: 100 Marks**	**Total: 100 Marks**

Unit 1: Basic Concepts of Management: Definition, Nature and Importance; Functions of the Management; Levels of Management; F.W Taylor's Scientific Management; Henry Fayol's Principles of Management.

Unit 2: Forms of Business Organizations: Introduction, Types of Business organizations: Private Sector- Individual Ownership, Partnership, Joint stock companies and Co-Operative organizations; Public sector- Departmental Organizations, Public Corporations and Government Companies; The Joint sector Management

Unit 3: Production and operations Management: Plant location- Factors to be considered in the selection of Plant location; Break - even analysis- Significance and managerial applications; Importance of Production Planning and Control and its Functions; Human Resource Management and Functions of Human Resource Manager (in brief); Functions of Marketing; Methods of Raising Finance

Unit 4: Entrepreneurship: Definition, Characteristics and Skills , Types of Entrepreneurs, Entrepreneur vs. Professional Managers, , Growth of Entrepreneurs, Nature and Importance of Entrepreneurs, Women Entrepreneurs, Problems of Entrepreneurship.

Unit 5: Entrepreneurial Development and Project Management: Institutions in aid of Entrepreneurship Development, Idea generation: Sources and Techniques;, Stages in Project formulation ; Steps for starting a small enterprise - Incentives for Small Scale Industries by Government

Text Books:

1. Sharma,S.C, and Banga, T.R., Industrial Organization & Engineering Economics, Khanna Publishers, Delhi, 2000.

Reference Books:

1. Vasant Desai ,The Dynamics of Entrepreneurial Development and Management (Planning for future Sustainable growth),H Imalayan Publishing House, 2018
2. Aryasri , A.R., Management Science, McGraw Hill Education (India Private Limited , New Delhi 2014.
3. Sheela, P. , and Jagadeswara Rao, K., Entrepreneurship, Shree Publishing House, Guntur

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