



# VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)


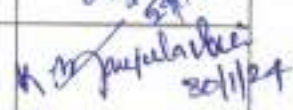


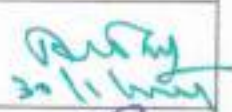


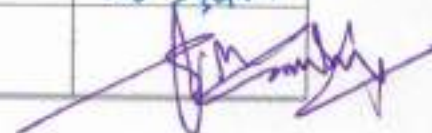
Bollikunta, Khila Warangal (Mandal), Warangal Urban - 506 005 (T.S)

## DEPARTMENT OF CIVIL ENGINEERING

### MINUTES OF BOARD OF STUDIES MEETING

held on 29.01.2024 at 09:30AM

#### Members Present

S.No	Name and Address	Designation	Signature
1.	Dr. G. Dineshkumar Associate Professor, Dept. of Civil Engineering, VCE, Warangal.	Chairman	 29/1/2024
2.	Dr. K. Manjula Vani Professor, Dept. of Civil Engineering, JNTUH CEH, Hyderabad.	Member (University Nominee)	 20/1/24
3.	Dr. P. Rathish Kumar Professor, Dept. of Civil Engineering, NIT, Warangal.	Member (Subject Expert)	 20/1/24
4.	Dr. S. Sunil Pratap Reddy Associate Professor, Dept. of Civil Engineering, KITS, Warangal	Member (Subject Expert)	
5.	Er. A. Nagender Rao Superintendent Engineer, R&B Department, Hanamkonda.	Member (Representative from Industry)	 20/1/2024
6.	Dr. K. Thirupathi Rao Professor, Dept. of Civil Engineering, VCE, Warangal.	Member (Faculty)	
7.	Mr. Syed Riyaz Assistant Professor, Dept. of Civil Engineering, VCE, Warangal.	Member (Faculty)	 20/1/24
8.	Er. S. Arun Kumar Assistant Executive Engineer, Mission Bhagiratha SD, Thorur.	Member (Alumni)	

The following decisions were taken during the Board of Studies meeting.

1. Approved the Course structure and Syllabi of B. Tech – Civil Engineering for III - Year (I & II Semester) and IV - Year (I & II Semester) under R22 - Regulation.
2. Approved the substitute subjects/additional subjects for the students who have been readmitted from R18 regulation to R22 regulation and R20 regulation to R22 regulation.

The chairman of Board of studies thanked all the members for their Suggestions and valuable guidance towards framing of Course Structure and Syllabi under R22 Regulation.

  
Chairman/BoS

**CHAIRMAN**

Board of Studies, Civil Engg Dept.,  
VAAGDEVI COLLEGE OF ENGINEERING  
Bollikunta, Warangal (Mandal) - 506 005

**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**B.Tech. in CIVIL ENGINEERING**  
**COURSE STRUCTURE - (R22 Regulations) - III & IV YEAR**  
**Applicable from Academic Year 2022-2023 admitted batch**

**III YEAR I - SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1.		Structural Analysis - II	3	0	0	3
2.		Geotechnical Engineering	3	0	0	3
3.		Structural Engineering -I (RCC)	3	0	0	3
4.		Business Economics & Financial Analysis	3	0	0	3
5.		Transportation Engineering	3	0	0	3
6.		Hydrology and Water Resources Engineering	3	0	0	3
7.		Transportation Engineering Laboratory	0	0	2	1
8.		Geotechnical Engineering Laboratory	0	0	2	1
9.		Intellectual Property Rights	3	0	0	0
		<b>Total Credits</b>	<b>21</b>	<b>0</b>	<b>4</b>	<b>20</b>

**III YEAR II - SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1.		Environmental Engineering	3	0	0	3
2.		Foundation Engineering	3	0	0	3
3.		Structural Engineering -II (Steel Structures)	3	0	0	3
4.		<b>Professional Elective - I</b> 1. Design of Hydraulic Structures 2. Advanced Water Resources Engineering 3. Ground Water Hydrology	3	0	0	3
5.		Open Elective - I	3	0	0	3
6.		Environmental Engineering Laboratory	0	0	2	1
7.		Computer Aided Design Laboratory	0	0	2	1
8.		Advanced English Communication Skills Laboratory	0	0	2	1
9.		Industry Oriented Mini Project / Internship	0	0	4	2
10.		Environmental Science	3	0	0	0
		<b>Total Credits</b>	<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

\* Environmental Science in III Year II Semester should be Registered by Lateral Entry Students Only.

1. 

2.  30/1/24

3.  29/1/24

4. 

5. 

6. 

7.  30/1/24

8. 


**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**B.Tech. in CIVIL ENGINEERING**  
**COURSE STRUCTURE - (R22 Regulations) - III & IV YEAR**  
**Applicable from Academic Year 2022-2023 admitted batch**


**IV YEAR I - SEMESTER**

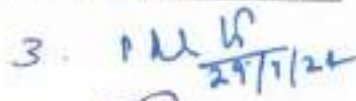
S. No.	Course Code	Course Title	L	T	P	Credits
1.		Quantity Survey & Valuation	2	0	0	2
2.		Project Management	2	0	0	2
3.		<b>Professional Elective – II</b> 1. Prestressed Concrete 2. Earth Retaining Structures 3. Repair and Rehabilitation of Structures	3	0	0	3
4.		<b>Professional Elective – III</b> 1. Design of Bridges 2. Elements of Earthquake Engineering 3. Ground Improvement Techniques	3	0	0	3
5.		<b>Professional Elective – IV</b> 1. Building Information Modelling 2. Green Building Technologies 3. Remote Sensing & Geographical Information System	3	0	0	3
6.		Open Elective - II	3	0	0	3
7.		Civil Engineering Software Laboratory	0	0	2	1
8.		Project Stage - I	0	0	6	3
		<b>Total Credits</b>	<b>16</b>	<b>0</b>	<b>8</b>	<b>20</b>


**IV YEAR II - SEMESTER**


S. No.	Course Code	Course Title	L	T	P	Credits
1.		<b>Professional Elective – V</b> 1. Solid Waste Management 2. Smart Cities Planning and Management 3. Air pollution	3	0	0	3
2.		<b>Professional Elective – VI</b> 1. Airports, Railways and Waterways 2. Pavement Analysis & Design 3. Pavement Asset Management	3	0	0	3
3.		Open Elective - III	3	0	0	3
4.		Project Stage – II including seminar	0	0	22	11
		<b>Total Credits</b>	<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>


1.  29/1/24


2.  30/1/24


3.  29/1/24

4.  2/1/24

5.  30/1/24

6.  29/1/24

7.  30/1/24

8.  30/1/24

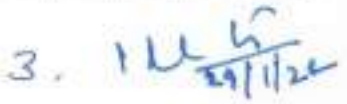
**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**B.Tech. in CIVIL ENGINEERING**  
**COURSE STRUCTURE - (R22 Regulations) - III & IV YEAR**  
**Applicable from Academic Year 2022-2023 admitted batch**

**OPEN ELECTIVES OFFERED BY THE DEPARTMENT**

S. No.	Course Code	Course Title	L	T	P	Credits
1.		Disaster Preparedness & Planning Management	3	0	0	3
2.		Building Technology	3	0	0	3
3.		Environmental Impact Assessment	3	0	0	3
4.		Sustainable Infrastructure Development	3	0	0	3
5.		Environmental Pollution and Control	3	0	0	3
6.		Energy Efficient Buildings	3	0	0	3

1. 

2.  30/1/24

3.  29/1/24

4. 

5. 

6. 

7.  30/1/24

8. 

# VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

## TRANSPORTATION ENGINEERING LABORATORY

B.Tech - III Year I – Semester

L T P C  
0 0 2 1

### Course Objectives:

- To provide knowledge on test of aggregates
- Impart properties of bitumen by various tests
- To understand Mix Design of sub base and bituminous layer
- To gain knowledge on different Traffic Surveys

### LIST OF EXPERIMENTS

#### Tests on aggregate

1. Shape Test - Flakiness and Elongation Index
2. Los Angeles Abrasion Test
3. Los Angeles Attrition Test

#### Tests on bitumen

4. Penetration and Softening Point
5. Ductility Value
6. Flash and Fire Point

#### Mix design

7. Marshall's Stability sample preparation and Testing

#### Traffic Surveys

8. Volume studies at Mid blocks and Intersection
9. Speed Studies using Spot speeds
10. Parking studies

**Course Outcomes:** At the end of this course, the students will able to:

**CO1:** Acquire skills in testing the aggregates

**CO2:** Know the procedure to design bituminous roads.

**CO3:** Measure the physical properties of bitumen for their suitability as road material.

**CO4:** Analyze the traffic based on traffic surveys.

### REFERENCE BOOKS:

1. Khanna, S.K., Justo, C.E.G and Veeraragavan, A, 'Highway Engineering', Nem Chand & Bros, 10<sup>th</sup> Edition, 2017
2. Srinivasa Kumar, R, Textbook of Highway Engineering, Universities Press, First Edition 2011.
3. Kadiyalai, L.R., 'Traffic Engineering and Transport Planning', Khanna Publishers, First Edition, 1999


### IS CODES:



- IS 1201 -1220 (1978) "Methods for testing tars and bituminous materials"
- IRC SP 53 -2010 "Guidelines on use of modified bitumen"
- MS-2 Manual for Marshalls Mix design 2002

### Online Resources:

1. <https://ts-nitk.vlabs.ac.in/transportation-engineering/>

1.   
4. 

2. K. Srinivasa Kumar 2011/24  
5. 

3. I U G 29/11/24  
6.   
7. 

# VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

## GEOTECHNICAL ENGINEERING LABORATORY

B.Tech - III Year I – Semester

L	T	P	C
0	0	2	1

### Course Objectives:

- To find out the method and practices of testing properties of the soil
- To learn the principles of permeability of soil
- To study the procedures of testing shear strength parameters of soil
- To obtain compression test on soil.

### LIST OF EXPERIMENTS

1. Atterberg Limits (Liquid Limit, Plastic Limit, and shrinkage limit)
2. a) Field density by core cutter method and  
b) Field density by sand replacement method
3. Determination of Specific gravity of soil Grain size distribution by sieve analysis
4. Permeability of soil by constant and variable head test methods
5. Standard Proctor's Compaction Test
6. Determination of Coefficient of consolidation (square root time fitting method)
7. Unconfined compression test
8. Direct shear test
9. Vane shear test
10. Differential free swell index (DFSI) test

**Course Outcomes:** At the end of this course, the students will able to:


- CO1: Identify and classify soils with reference to their characteristics
- CO2: Learn about grain size distribution using sieve analysis
- CO3: Calculate the permeability value of the soil
- CO4: Determine the shear strength properties of the soil

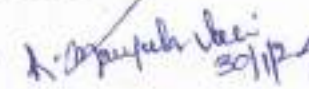
### REFERENCE BOOKS:

1. Murthy, V.N.S., "Soil Mechanics and Foundation Engineering", CBS Publishers Distribution Ltd., First Edition, 2018
2. Gopal Ranjan and Rao, A.S.R., "Basic and Applied Soil Mechanics", New Age Ltd. International Publisher, 3<sup>rd</sup> Edition, 2019.
3. Punmia, B.C., Ashok Kumar Jain and Arun Kumar Jain "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd. New Delhi, 17<sup>th</sup> Edition 2019.

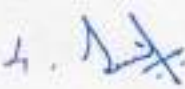
### Online Resources:

1. <https://smfe-iiith.vlabs.ac.in/>
2. <https://nptel.ac.in/courses/105/101/105101160/>


1.  29/1/24

2.  30/1/24


3.  29/1/24

4. 

5. 

6. 

7.  31/1/24

8. 

**VAAGDEVI COLLEGE OF ENGINEERING**  
(Autonomous)

**ENVIRONMENTAL ENGINEERING LABORATORY**

**B.Tech - III Year II – Semester**

L	T	P	C
0	0	2	1

**Course Objectives:**

- To conduct test on determination of water standards
- To understand the procedure of determining various parameters of water
- To impart knowledge on evaluating chloride content
- To attain knowledge of B.O.D and C.O.D determination

**LIST OF EXPERIMENTS**

1. Determination of pH
2. Determination of Electrical Conductivity
3. Determination of Acidity
4. Determination of Alkalinity
5. Determination of Total Hardness
6. Determination of Chlorides
7. Determination of optimum coagulant Dosage
8. Determination of Dissolved Oxygen
9. Determination of COD
10. Determination of BOD

**Course Outcomes:** On completion of the course, the students will be able to:

**CO1:** Test water to determine pH and conductivity

**CO2:** Estimate quality of water

**CO3:** Determine chloride content in water

**CO4:** Determine BOD and COD of water

**REFERENCE BOOKS:**

1. Howard S. Peavy, Donald R. Rowe and George Tchobanoglous, "Environmental Engineering", McGraw Hill, First Edition 2017
2. Duggal, K. N., Elements of Environmental Engineering, S. Chand & Co., 3<sup>rd</sup> Edition, 2008.

**Online Resources:**

1. <https://ee1-nitk.vlabs.ac.in/List%20of%20experiments.html>

1.  29/1/24

2.  30/1/24

3.  29/1/24

4. 

5. 

6. 

7.  24/1/24

8. 

# VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

## COMPUTER AIDED DESIGN LABORATORY

B.Tech - III Year II – Semester

L	T	P	C
0	0	2	1

### Course Objectives:

- Learn the usage of any fundamental software for design
- Create geometries using pre-processor
- Analyze and Interpret the results using post processor
- Design the structural elements

### LIST OF EXPERIMENTS

1. Analysis & Design determinate beams using a software
2. Analysis & Design of fixed beam using a software
3. Analysis & Design of Plane Frames
4. Analysis & Design of space frames
5. Analysis & Design of residential building
6. Analysis & Design of Roof Trusses
7. Design and detailing of built up steel beam
8. Developing an excel template for foundation design
9. Detailing of RCC beam and RCC slab
10. Detailing of RCC column and RCC footing

**Course Outcomes:** On completion of the course, the students will be able to:

**CO1:** Analyse and design the beams and frames

**CO2:** Design the building under all loading conditions

**CO3:** Analyse the roof truss and built up steel beams

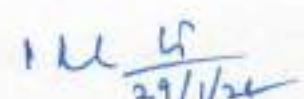
**CO4:** Draw the detailing of beam, slab, Column and Footing.

### REFERENCE BOOKS

1. B.C. Punmia, Ashok K. Jain and Arun K. Jain, "Limit State design of Reinforced Concrete", Laxmi Publications (P) Ltd., 2<sup>nd</sup> Edition, 2016
2. Unnikrishnan Pillai and Devdas Menon, "Reinforced Concrete Design", Tata McGraw Hill Publishing Company Ltd., 3<sup>rd</sup> Edition, 2017
3. N. Krishnaraju, "Design of Reinforced Concrete Structures, IS: 456-2000", CBS Publications, 4<sup>th</sup> Edition, 2019

1.  29/1/24

2.  20/1/24

3.  29/1/24

4. 

5. 

6. 

7.  24/1/24

8. 



# VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

## CIVIL ENGINEERING SOFTWARE LABORATORY

B.Tech - IV Year I – Semester

L T P C  
0 0 2 1

**Pre-Requisites:** Structural Engineering - I & II

### Course Objectives:

- Learn the usage of software for analysis and design
- Estimate the Multi storey buildings using excel template
- Analyze and Interpret the results using post processor
- Design the structural elements

### LIST OF EXPERIMENTS

1. Three dimensional modelling of a building using software.
2. Rendering of buildings using software.
3. Planning and Estimation of Multi-storey buildings and development of Excel Template.
4. Digitization of Maps using software.
5. Creation of Thematic Maps using software.
6. Analysis of continuous Beams
7. Analysis and Design of Multi storey Buildings
8. Analysis of steel framed structure.
9. Demonstration to Analysis of different types of Bridge structures.
10. Demonstration to Finite Element Analysis software.

Note : Open/education/academic version of software can be used.

**Course Outcomes:** On completion of the course, the students will be able to:

CO1: Analyse the beams and framed structure

CO2: Analyse the building under all loading conditions

CO3: Analyse the steel frame structures

CO4: Acquire knowledge on finite element analysis software.

### REFERENCE BOOKS

1. B.C. Punmia, Ashok K. Jain and Arun K. Jain, "Limit State design of Reinforced Concrete", Laxmi Publications (P) Ltd., 2<sup>nd</sup> Edition, 2016
2. Unnikrishnan Pillai and Devdas Menon, "Reinforced Concrete Design", Tata McGraw Hill Publishing Company Ltd., 3<sup>rd</sup> Edition, 2017
3. Datta B.N. Estimating and Costing, Charator Publishing House, 28th Revised Edition, 2016

1. 

2. K.  30/1/24

3.  29/1/24

4. 

5. 

6. 

7.  30/1/24

8. 



# VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), [www.vaagdevi.edu.in](http://www.vaagdevi.edu.in)

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

### BOARD OF STUDIES MEETING

Minutes of meeting of Board of studies in Computer Science and Engineering (Data Science) held on 23-01-2024 at 02:00 pm.

#### Members Present:

S.No	Name and Address	Designation	Signature
1	Dr. Ayesha Banu Associate Professor & Head, CSE (Data Science), VCE.	Chairman	
2	Dr. A. Kavitha Associate Professor of CSE & Additional Controller of Examinations, JNTU, Hyderabad.	Member (Univ. Nominee)	
3	Prof. R.B.V. Subramaanyam Professor, NITW.	Member (Subject Expert)	
4	Prof. G. Narsimha Professor (CSE) & Principal, JNTUH College of Engineering, Sulthanpur, Telangana.	Member (Subject Expert)	
5	Dr. J. Sravanthi Assistant Professor, CSE(Data Science), VCE.	Member (Subject Expert)	
6	Gurrapu Venkata Krishna Ramanujam Senior Software Engineer Nagaroo	Member (Alumni Member)	
7	Mr. Sarath. J Director, Innominds India pvt. ltd.	Member (Industry Representative)	

#### **The following decisions are taken:**

1. Approved the course structure of B. Tech CSE (Data Science), (R22) Regulations for III and IV Year (I and II Semesters).
2. Approved the syllabi of B. Tech CSE (Data Science), (R22) Regulations for III and IV Year (I and II Semesters).

3. Approved the list of Open Electives offered to other branches. All open electives are  
\* In line with JNTUH R22 Course structure & syllabus.

CHAIRMAN

Board of studies  
Dr. Ayesha Banu

**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**COMPUTER SCIENCE AND ENGINEERING**  
**(DATA SCIENCE)**  
 Applicable from AY 2022-23 Batch

**III Year I Semester (V SEM)**

S.No	Course Code	Course	L	T	P	Credits
1	B22CS72	Algorithms Design and Analysis	3	0	0	3
2	B22DS03	Introduction to Data Science	3	1	0	4
3	B22CS28	Computer Networks	3	0	0	3
4	B22DS04 B22CS41 B22AI07 B22CS31 B22CS33	<b>Professional Elective – I</b> Data Warehousing and Business Intelligence Artificial Intelligence Web Programming Image Processing Computer Graphics	3	0	0	3
5	B22DS05 B22CS35 B22DS06 B22CS29 B22AI14	<b>Professional Elective – II</b> Spatial and Multimedia Databases Information Retrieval Systems Software Project Management DevOps Computer Vision and Robotics	3	0	0	3
6	B22DS07	R Programming Lab	0	0	2	1
7	B22CS37	Computer Networks Lab	0	0	2	1
8	B22EN03	Advanced English Communication Skills Lab	0	0	2	1
9	B22DS08	ETL-Kafka/Talend	0	0	2	1
10	B22MB06	Intellectual Property Rights	3	0	0	0
<b>Total</b>			<b>18</b>	<b>1</b>	<b>08</b>	<b>20</b>

1. Dr. Ayesha Banu - *Ayesha*
2. Dr. A. Karitha - *Dr. A. Karitha*
3. *R.B.V. Subramanyam* - (Prof. R.B.V. Subramanyam)
4. Prof. G. Naliniha - *G. Naliniha*
5. Dr. J. Sravanthi - *Sravanthi J.*
6. *G.V.K. Ramanujam* - (G.V.K. Ramanujam)
7. J. Sarath - *Sarath*

III Year II Semester (VI SEM)

S.No	Course Code	Course	L	T	P	Credits
1.	B22AI01	Automata Theory and Compiler Design	3	0	0	3
2.	B22AI05	Machine Learning	3	0	0	3
3.	B22DS09	Big Data Analytics	3	0	0	3
4.	B22CS46 B22DS10 B22CS44 B22CS45 B22CS54	<b>Professional Elective - III</b> Software Testing Methodologies Data Visualization Techniques Scripting Languages Mobile Application Development Cryptography and Network Security	3	0	0	3
5.		<b>Open Elective - I</b> « options will be approved in other dept BOS »	3	0	0	3
6.	B22AI08	Machine Learning Lab	0	0	2	1
7.	B22DS14	Big Data Analytics Lab	0	0	2	1
8.	B22CS52 B22DS11 B22CS50 B22CS51 B22CS65	<b>Professional Elective - III Lab</b> Software Testing Methodologies Lab Data Visualization Techniques Lab Scripting Languages Lab Mobile Application Development Lab Cryptography and Network Security Lab	0	0	2	1
9.	B22DS15	Industrial Oriented Mini Project/ Summer Internship/ Skill Development Course (UI design- Flutter)	0	0	4	2
10	B22CH03	Environmental Science	3	0	0	0
<b>Total</b>			<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

1. Dr. Ayeesha Banu - *[Signature]*
2. Dr. A. Kanitha - *[Signature]*
3. *[Signature]* - (Prof. R.B.V. Subramanyam)
4. Prof. G. Narasimha - *[Signature]*
5. Dr. J. Sravanthi - *[Signature]*
6. *[Signature]* (G.V.K. Ramarajam)
7. J. Sathish - *[Signature]*

\* Environmental Science should be registered by lateral entry students only.

IV Year I Semester (VII SEM)

S.No	Course Code	Course	L	T	P	Credits
1.	B22DS16	Predictive Analytics	3	0	0	3
2.	B22DS17	Web and Social Media Analytics	3	0	0	3
3.	B22AI23 B22DS18 B22AI11 B22DS19 B22CS43	<b>Professional Elective – IV</b> Quantum Computing Database Security Natural Language Processing Information Storage Management Internet of Things	3	0	0	3
4.	B22DS20 B22AI22 B22DS21 B22DS22 B22DS23	<b>Professional Elective – V</b> Privacy Preserving Data Publishing Cloud Computing Data Science Applications Mining Massive Datasets Exploratory Data Analysis	3	0	0	3
5.		<b>Open Elective – II</b> ← options will be approved in other dept kos →	3	0	0	3
6.	B22DS25	Predictive Analytics Lab	0	0	2	1
7.	B22DS24	Web and Social Media Analytics Lab	0	0	2	1
8.	B22DS26	Project Stage – I	0	0	6	3
		<b>Total Credits</b>	<b>15</b>	<b>0</b>	<b>10</b>	<b>20</b>

1. Dr. Ayesha Banu - *Ayesha*
2. Dr. A. Karitha - *A. Karitha*
3. *R.B.V. Subramanyam* (Prof: R.B.V. Subramanyam)
4. Prof. G. Naliniha - *G. Naliniha*
5. Dr. J. Sravanthi - *Sravanthi. J*
6. *G.V.K. Ramarajam*
7. J. Sarath - *Sarath*



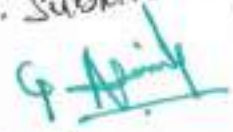

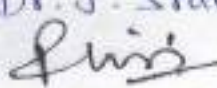
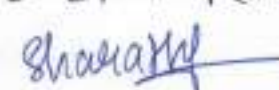
IV Year II Semester (VIII SEM)

S.No	Course Code	Course	L	T	P	Credits
1.	B22MB09	Organizational Behavior	3	0	0	3
2.		<b>Professional Elective – VI</b>	3	0	0	3
	B22DS27	Data Stream Mining				
	B22AI33	Web Security				
	B22DS28	Video Analytics				
	B22CS63	Block chain Technology				
	B22DS29	Parallel and Distributed Computing				
3.		<b>Open Elective – III</b>	3	0	0	3
4.	B22DS32	Project Stage – II including Seminar	0	0	22	11
		<b>Total Credits</b>	<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>

1. Dr. Ayerka Banu - *Ayerka Banu*
2. Dr. A. Kanika - *A. Kanika*
3. *R.B.V. Subramanyam* (Prof. R. B. V. Subramanyam)
4. Prof. G. Narsika - *G. Narsika*
5. Dr. J. Sravanthi - *Sravanthi J.*
6. *G.V.K. Ramonujam*
7. J. Sarathi - *Sarathi*

**LIST OF OPEN ELECTIVES OFFERED TO OTHER BRANCHES**

S.No	Course Code	Course	L	T	P	Credits
1.	B22DS12 B22DS13	<b>Open Elective – I</b> Fundamentals of Data Science R Programming	3	0	0	3
2.	B22AI21 B22AI10	<b>Open Elective – II</b> Data Mining Data Analytics	3	0	0	3
3.	B22DS30 B22DS31	<b>Open Elective – III</b> Introduction to social media mining Data Visualization using Python	3	0	0	3
		<b>Total Credits</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>

1. Dr. Ayema Banu 
2. Dr. A. Karitha - 
3. R.R. Banu (Prof. R.B.V. Subramanyam)
4. Prof. G. Nagesh - 
5. Dr. J. Sravanthi - 
6.  - G.V.K. Ramamuram
7. J. Sarath - 



# VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), [www.vaagdevi.edu.in](http://www.vaagdevi.edu.in)

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### BOARD OF STUDIES MEETING

Minutes of meeting of Board of studies in Computer Science and Engineering held on 27-Mar-2023 at 02:30 pm.

#### Members Present:

S.No	Name and Address	Designation	Signature
1	Dr. N.Satyavathi Associate Professor & Head ,CSE VCE.	Chairman	
2	Dr. A. Kavitha, Associate Professor of CSE & Additional Controller of Examinations, JNTU, Hyderabad.	Member (Univ. Nominee)	
3	Prof. R.B.V. Subramaanyam Professor, NITW.	Member (Subject Expert)	
4	Prof. G. Narsimha Professor (CSE) & Principal, JNTUH College of Engineering, Sulthanpur, Telangana.	Member (Subject Expert)	
5	Dr.K.Rajesh khanna Associate Professor, CSE, VCE.	Member (Subject Expert)	
6	Gurrapu Venkata Krishna Ramanujam Senior Software Engineer Nagaroo	Member (Alumni Member)	
7	Mr. Sarath. J Director, Innominds India pvt. ltd.	Member (Industry Representative)	

#### The following decisions are taken:

1. Approved the mandatory course titled "Environmental Science" for B.Tech CSE I Year II Semester as it was updated by JNTUH post BOS. [Dated 13-NOV-2022] BOS Date: 10-NOV-22.
2. Approved the course structure and syllabi of B. Tech CSE, (R22) Regulations for II Year (I and II Semesters). (Which is inline with JNTUH B.Tech CSE R22 course structure)

CHAIRMAN  
Board of studies  
Dr. N.Satyavathi

Department of CSE





**VAAGDEVI COLLEGE OF ENGINEERING**  
(AUTONOMOUS)  
**COMPUTER SCIENCE AND ENGINEERING**  
Applicable from AY2022-23Batch

**II YEAR I SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1	B22EC12	Digital Electronics	3	0	0	3
2	B22CS11	Data Structures	3	0	0	3
3	B22MA04	Computer Oriented Statistical Methods	3	1	0	4
4	B22CS12	Computer Organization and Architecture	3	0	0	3
5	B22CS13	Object Oriented Programming through Java	3	0	0	3
6	B22CS14	Data Structures Lab	0	0	3	1.5
7	B22CS15	Object Oriented Programming through Java Lab	0	0	3	1.5
8	B22DS01	Data visualization- R Programming/ Power BI	0	0	2	1
9	B22MC07	Gender Sensitization Lab	0	0	2	0
		<b>Total</b>	<b>15</b>	<b>1</b>	<b>10</b>	<b>20</b>

**II YEAR II SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1	B22CS16	Discrete Mathematics	3	0	0	3
2	B22MB01	Business Economics & Financial Analysis	3	0	0	3
3	B22CS17	Operating Systems	3	0	0	3
4	B22CS18	Database Management Systems	3	0	0	3
5	B22CS19	Software Engineering	3	0	0	3
6	B22CS20	Operating Systems Lab	0	0	2	1
7	B22CS21	Database Management Systems Lab	0	0	2	1
8	B22CS22	Real-time Research Project/ Societal Related Project	0	0	4	2
9	B22CS23	Node JS/ React JS/ Django	0	0	2	1
10	B22MB10	Constitution of India	3	0	0	0
		<b>Total</b>	<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

1) *Salya*  
(Dr. N. Satejavathi)

3) *R.B.V. Subramanyam*  
(Prof. R. B. V. Subramanyam)

2) *Kavitha*  
(Dr. A. Kavitha)

4) *G. Narasimha*  
(Prof. G. Narasimha)

5) *K. Rajesh Khanna*  
(Dr. K. Rajesh Khanna)

6) *R. V. K. Ramanejani*  
(G. V. K. Ramanejani)

7) *Shanath*  
(Mr. Shanath. J)



# VAAGDEVICOLLEGE OF ENGINEERING

Autonomous

Bellikunta, Khila Warangal (Mandal), Warangal Urban-506005 (T.S), www.vaagdevi.edu.in

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Artificial Intelligence and Machine Learning)

### BOARD OF STUDIES MEETING

Minutes of meeting of Board of studies in Computer Science and Engineering (Artificial Intelligence and Machine Learning) held on 23-Jan-2024 at 02:00 pm.

#### Members Present:

S.No	Name and Address	Designation	Signature
1	Dr. Thanveer Jahan Associate Professor & Head, CSE(AI&ML) VCE.	Chairman	
2	Dr. A. Kavitha Associate Professor of CSE & Additional Controller of Examinations, JNTU, Hyderabad.	Member (Univ. Nominee)	 27/1/24
3	Prof. R. B. V. Subramaanyam, Professor, NITW.	Member (Subject Expert)	
4	Prof. G. Narsimha Professor (CSE) & Principal, JNTUH College of Engineering, Sulthanpur, Telangana.	Member (Subject Expert)	
5	Dr. B. Sravan Kumar Assistant Professor, CSE(AI&ML), VCE.	Member (Subject Expert)	
6	Gurrapu Venkata Krishna Ramanujam Senior Software Engineer, Nagaroo	Member (Alumni Member)	
7	Mr. Sarath J Director, Innominds India Pvt. Ltd.	Member (Industry Representative)	

#### The following decisions are taken:

1. Approved the course structure of B. Tech CSE(AI&ML), R22 Regulations for III Year (I and II Semesters) and IV year (I and II Semesters).
2. Approved the course syllabi of B. Tech CSE (AI&ML), R22 Regulations for III Year (I and II Semesters) and IV year (I and II Semesters).
3. Approved the list of open electives offered to other branches.

- All Open Elective are  
4. In line with JNTUH B.Tech CSE(AI&ML)  
R22 course structure and syllabi.

CHAIRMAN

Board of Studies  
Dr. Thanveer Jahan

Department of CSE (AI&ML)

**COURSE STRUCTURE  
AND  
DETAILED SYLLABUS**

**COMPUTER SCIENCE AND ENGINEERING  
(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)**

**For  
B.TECH FOUR YEAR DEGREE PROGRAMME  
(Applicable for the batches admitted from 2022-2023)**



**VAAGDEVI COLLEGE OF ENGINEERING  
(Autonomous)  
Bollikunta, Warangal, 506005  
Telangana State, India.**

VAAGDEVI COLLEGE OF ENGINEERING  
(AUTONOMOUS)  
COMPUTER SCIENCE AND ENGINEERING  
(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

COURSE STRUCTURE

(R22Regulations applicable for the batches admitted from Academic Year 2022-2023)

III YEAR-I SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits
1	B22CS27	Design and Analysis of Algorithms	3	1	0	4
2	B22AI05	Machine Learning	3	0	0	3
3	B22CS28	Computer Networks	3	0	0	3
4	B22MB01	Business Economics & Financial Analysis	3	0	0	3
5	<b>Professional Elective-I</b>		3	0	0	3
	B22CS56	Graph Theory				
	B22AI06	Introduction to Data Science				
	B22AI07	Web Programming				
	B22CS31	Image Processing				
B22CS33	Computer Graphics					
6	B22AI08	Machine Learning Lab	0	0	2	1
7	B22CS37	Computer Networks Lab	0	0	2	1
8	B22EN03	Advanced English Communication Skills Lab	0	0	2	1
9	B22AI09	UI design-Flutter	0	0	2	1
10	B22MB06	Intellectual Property Rights	3	0	0	0
<b>Total</b>			<b>18</b>	<b>01</b>	<b>08</b>	<b>20</b>

III YEAR- II SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits
1	B22AI10	Knowledge Representation and Reasoning	3	0	0	3
2	B22AI11	Data Analytics	3	0	0	3
3	B22AI12	Natural Language Processing	3	0	0	3
4	<b>Professional Elective-II</b>		3	0	0	3
	B22CS46	Software Testing Methodologies				
	B22CS35	Information Retrieval Systems				
	B22AI13	Pattern Recognition				
	B22AI14	Computer Vision and Robotics				
B22DS04	Data Warehousing and Business Intelligence					
5	<b>Open Elective-I</b>		3	0	0	3
6	B22AI17	Natural Language Processing Lab	0	0	3	1.5
7	B22AI18	Principles of Data Analytics Lab	0	0	3	1.5
8	B22AI19	Industrial Oriented Mini Project/Internship/Skill Development Course (DevOps)	0	0	4	2
9	B22CH03	Environmental Science	3	0	0	0
<b>Total</b>			<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

Environmental Science in III Yr II Sem Should be Registered by Lateral Entry Students Only.

1. *Tharveer Jahan*  
(Dr. Tharveer Jahan)

2. *[Signature]*  
(Dr. A. Kavitha)

3. *[Signature]*  
(Prof. R. B. V. Subramanyam)

4. *[Signature]*  
(Prof. G. Narasimha)

5. *[Signature]*  
(Dr. B. Sravan Kumar)

6. *[Signature]*  
(Mr. G. V. R. Ramanujam)

7. *[Signature]*  
(Mr. J. Sarath)

## IV YEAR-I SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits	
1	B22AI20	Deep Learning	3	0	0	3	
2	B22AI21	Nature Inspired Computing	2	0	0	2	
<b>Professional Elective-III</b>							
3	B22CS43	Internet of Things	3	0	0	3	
	B22AI22	Data Mining					
	B22CS44	Scripting Languages					
	B22CS45	Mobile Application Development					
	B22AI23	Cloud Computing					
<b>Professional Elective-IV</b>							
4	B22AI24	Quantum Computing	3	0	0	3	
	B22AI25	Expert Systems					
	B22AI26	Semantic Web					
	B22AI27	Game Theory					
	B22AI28	Mobile Computing					
5	<b>Open Elective-II</b>			3	0	0	3
6	B22AI31	Professional Practice, Law & Ethics	0	0	4	2	
<b>Professional Elective-III Lab</b>							
7	B22CS49	Internet of Things Lab	0	0	2	1	
	B22AI32	Data Mining Lab					
	B22CS50	Scripting Languages Lab					
	B22CS51	Mobile Application Development Lab					
	B22AI33	Cloud Computing Lab					
8	B22AI34	Project Stage-I	0	0	6	3	
<b>Total Credits</b>			<b>14</b>	<b>0</b>	<b>12</b>	<b>20</b>	

## IV YEAR- II SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits	
<b>Professional Elective-V</b>							
1	B22AI35	Social Network Analysis	3	0	0	3	
	B22AI36	Federated Machine Learning					
	B22AI37	Augmented Reality & Virtual Reality					
	B22AI38	Web Security					
	B22CS59	Ad-hoc & Sensor Networks					
<b>Professional Elective-VI</b>							
2	B22AI39	Speech and Video Processing	3	0	0	3	
	B22CS62	Robotic Process Automation					
	B22AI40	Randomized Algorithms					
	B22AI41	Cognitive Computing					
	B22AI42	Conversational AI					
3	<b>Open Elective-III</b>			3	0	0	3
4	B22AI45	Project Stage-II including Seminar	0	0	22	11	
<b>Total Credits</b>			<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>	

\*MC-Satisfactory/Unsatisfactory

1. (Dr. Tharveer Jahan)
2. (Dr. A. Ravitha)
3. (Prof. R. B. V. Subramanyam)
4. (Prof. U. Narasimha)
5. (Dr. B. Sreyan Kumar)
6. (Mr. G. V. K. Ramanujam)
7. (Mr. J. Sarath)

## Open Elective I:

1	B22AI15	Fundamentals of AI
2	B22AI16	Machine Learning Basics

## Open Elective II:

1	B22AI29	Introduction to Natural Language Processing
2	B22AI30	AI applications

## Open Elective III:

1	B22AI43	Chat bots
2	B22AI44	Evolutionary Computing

*Thanneer Jahan*

1. (Dr. Thanneer Jahan)

*A. Kavitha*  
27/1/24  
2. (Dr. A. Kavitha)

*R.B.V. Subramanyam*  
3. (Prof. R.B.V. Subramanyam)

*G. Anish*  
4. (Prof. G. Anish)

*S. Sarath*  
5. (Dr. S. Sarath Kumar)

*G.V.K. Ramanujam*  
6. (Mr. G.V.K. Ramanujam)

*Sarath*  
7. (Mr. J. Sarath)



**VAAGDEVI COLLEGE OF ENGINEERING**  
Autonomous  
Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S),  
www.vaagdevi.edu.in

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

Minutes of the meeting of the Board of Studies (BoS) held on: 25/01/2024

S. No	Members Present	Designation	Signature
1.	Dr. M. Shashidhar, Professor & HOD, ECE Dept., VCE Warangal. sasi47004@gmail.com	Chairman	
2.	Dr. Y. Raghavendra Rao, Head of the Department JNTU , Sulthanpur yraghavenderrao@gmail.com	JNTUH Nominee	
3.	Dr. S. Anuradha , Professor, NIT Warangal anuradha@nitw.ac.in	Subject Expert	
4.	Prof. P. Prasad Rao, Principal, VEC Warangal principal.vec@gmail.com	Subject Expert	
5.	Dr. V. Sudheer Raja, Assoc. Prof, ECE Dept, VCE, Warangal sudhecrraja_v@vaagdevi.edu.in	Member	
6.	Dr. G. Koteswara Rao , Asst. Prof, ECE Dept, VCE, Warangal koteswarrao_g@vaagdevi.edu.in	Member	
7.	Mr. Bala Krishna Islavath, Scientist, R&D Laboratory center for Electromagnetic, Ministry of Electronics and Information Technology, Government of India islavath32@gmail.com	Alumni	
8.	Mr. P. Mahesh, Senior Silicon Design Engineer at AMD goud.mahesh058@live.com	Alumni	

**The following decisions are taken:**

1. Course Structure and Syllabi of B.Tech III and IV Year under R22 regulation are finalized and approved.
2. B.Tech EEE. III and IV Year Subjects syllabi are approved  
(Subjects: Basics of Signals and Systems, Digital Signal Processing, Microprocessor & Microcontrollers, Microprocessor & Microcontrollers laboratory, VLSI Design, Embedded Systems Applications).
3. Open source Softwares are used in all Labs.

(Chairman-BoS)

### MICROCONTROLLERS LABORATORY

B.Tech. III Year I Semester

L	T	P	C
0	0	2	1

**Cycle 1: Using 8086 Processor Kits and/or Assembler**

- Assembly Language Programs to 8086 to Perform
  1. Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.
  2. Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations.

**Cycle 2: Using 8051 Microcontroller Kit**

- Introduction to IDE
  1. Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions
  2. Time delay Generation Using Timers of 8051.
  3. Serial Communication from / to 8051 to / from I/O devices.
  4. Program Using Interrupts to Generate Square Wave 10 KHZ Frequency on P2.1 Using Timer 0 8051 in 8 bit Auto reload Mode and Connect a 1 HZ Pulse to INT1 pin and Display on Port 0. Assume Crystal Frequency as 11.0592 MHZ

**Cycle 3: Interfacing I/O Devices to 8051**

1. 7 Segment Display to 8051.
2. Matrix Keypad to 8051.
3. 8-bit ADC Interface to 8051.
4. Triangular Wave Generator through DAC interfaces to 8051.

**Cycle 4: Experiments to be carried out on Cortex-M3 development boards and using GNU tool-chain**

1. Blink an LED with software delay, delay generated using the SysTick timer.
2. System clock real time alteration using the PLL modules.
3. Control intensity of an LED using PWM implemented in software and hardware.
4. Control an LED using switch by polling method, by interrupt method and flash the LED once every five switch presses.

**Course Outcomes:** Upon completing this course, the students will be able to:

1. Write assembly language programs and implement on 8086.
2. Write assembly language programs and implement on 8051
3. Interface the I/O devices with 8051 micro controllers
4. Perform experiments on Cortex-M3 development boards using GNU tool-chain

**CO-PO/PSO Mapping**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	-	-	-	-	-	-	1	-	2	2
CO2	3	3	3	3	3	-	-	-	-	-	-	1	-	3	2
CO3	3	3	3	3	3	-	-	-	-	-	-	1	-	3	2
CO4	3	3	3	3	3	-	-	-	-	-	-	1	-	2	3

1) *[Signature]*4) *[Signature]*

7)

2) *[Signature]*5) *[Signature]*

8)

3) *[Signature]*6) *[Signature]*



## IOT ARCHITECTURE AND PROTOCOLS LABORATORY

B.Tech. III Year I Semester

L T P C  
0 0 2 1

## List of Experiments:

1. Demonstrate blinking of an LED at every 5 seconds and to control the brightness of an LED.
2. Read Humidity and Room Temperature using DHT sensor and display the readings.
3. Send the recorded values of Temperature/Humidity to the Internet via GSM module using Arduino/NodeMCU/Raspberry Pi.
4. Demonstrate Interfacing NodeMCU/Raspberry Pi with the Cloud using REST API and MQTT protocol.
5. Demonstrate Switching lights on /off remotely using Arduino/NodeMCU/Raspberry Pi.
6. Voice-based Home Automation for switching lights on/off using Google Assistant, IFTTT and MQTT.
7. Interfacing DHT11 sensor with Raspberry pi/equivalent and upload temperature and humidity values to the cloud.
8. Design an obstacle detection unit using ultrasonic sensor.
9. Capture images from web camera using Raspberry Pi/equivalent and apply filters in increase image quality.
10. Access a remote computer from Raspberry Pi and display the remote screen.
11. Design an automatic water sprinkler based on soil moisture using Arduino/NodeMCU/Raspberry Pi.
12. Design an RFID based attendance system using Arduino/NodeMCU/Raspberry Pi.
13. Write an arduino program to demonstrate interrupts
14. Write an arduino program to demonstrate UART communication protocol
15. Write an arduino program to demonstrate I2C communication protocol
16. Write an arduino program to demonstrate SPI communication protocol

**Course Outcomes:** Upon completing this course the students will be able to:

1. Utilize the different sensors like room temperature, DHT, Humidity etc.,
2. Interface the sensors and processor for transmission of data.
3. Capture the images and process it on Arduino/NodeMCU/Raspberry Pi.
4. know the utilization of various protocols like I2c, UART communication etc.,

## CO-PO/PSO Mapping:

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	3	3	3	1	1	-	-	-	-	1	-	2	3
CO2	3	2	3	3	3	1	1	-	-	-	-	1	-	2	3
CO3	3	2	3	3	3	1	1	-	-	-	-	1	-	2	3
CO4	3	2	3	3	3	1	1	-	-	-	-	1	-	2	3

1) *[Handwritten signature]*5) *[Handwritten signature]*2) *[Handwritten signature]*6) *[Handwritten signature]*3) *[Handwritten signature]*7) *[Handwritten signature]*4) *[Handwritten signature]*8) *[Handwritten signature]*

## DIGITAL SIGNAL PROCESSING LABORATORY

B.Tech. III Year II Semester

L T P C  
0 0 2 1

The Programs shall be implemented using MATLAB Software.

**Note:** - Minimum of 12 experiments has to be conducted.**List of Experiments:**

1. Generation of Sinusoidal Waveform / Signal based on Recursive Difference Equations
2. To find DFT / IDFT of given DT Signal
3. To find Frequency Response of a given System given in Transfer Function/ Differential equation form.
4. Implementation of FFT of given Sequence
5. Determination of Power Spectrum of a given Signal(s).
6. Implementation of LP FIR Filter for a given Sequence.
7. Implementation of HP FIR Filter for a given Sequence.
8. Implementation of LP IIR Filter for a given Sequence.
9. Implementation of HP IIR Filter for a given Sequence.
10. Generation of Narrow Band Signal through Filtering
11. Generation of DTMF Signals
12. Implementation of Decimation Process
13. Implementation of Interpolation Process
14. Implementation of I/D Sampling Rate Converters
15. Impulse Response of First order and Second Order Systems.

**Course Outcomes:** Upon completion of this Lab, the student will be able to

- 1: Analyze signals using the discrete Fourier transform (DFT).
- 2: Understand FFT algorithm for efficient computation of DFT.
- 3: Design IIR & FIR filters.
- 4: Design multi rate signal processing of signals through systems.

**CO-PO/PSO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3	-	2	2	2	1	-	2	2	3	-
CO2	2	1	-	-	3	-	2	2	2	1	-	2	2	3	-
CO3	3	3	3	3	3	-	2	2	2	1	-	2	2	3	-
CO4	3	3	3	3	3	-	2	2	2	1	-	2	2	3	-

1)

5)

2)

6)

3)

7)

4)

8)

## CMOS VLSI DESIGN LABORATORY

B.Tech. III Year II Semester

L	T	P	C
0	0	2	1

Note: Any SIX of the following experiments from each part are to be conducted (Total 12)

**Part - I**

All the following experiments have to be implemented using HDL

1. Realize all the logic gates
2. Design of 8-to-3 encoder (without and with priority) and 2-to-4 decoder
3. Design of 8-to-1 multiplexer and 1-to-8 demultiplexer
4. Design of 4 bit binary to gray code converter
5. Design of 4 bit comparator
6. Design of Full adder using 3 modeling styles
7. Design of flip flops: SR, D, JK, T
8. Design of 4-bit binary, BCD counters (synchronous/ asynchronous reset) or any sequence counter
9. Finite State Machine Design

**Part - II**

Layout, physical verification, placement & route for complex design, static timing analysis, IR drop analysis and crosstalk analysis for the following:

1. Basic logic gates
2. CMOS inverter
3. CMOS NOR/ NAND gates
4. CMOS XOR and MUX gates
5. Static / Dynamic logic circuit (register cell)
6. Latch
7. Pass transistor
8. Layout of any combinational circuit (complex CMOS logic gate).

**Course Outcomes:**

1. Acquire knowledge on High end Simulation tools like Mentor Graphics, Tanner EDA etc.
2. Design digital circuits at different levels using programming concepts.
3. Implement any type of digital systems.
4. Program any available FPGA and CPLD using implementation tool.

**CO-PO/PSO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	3	-	2	2	2	1	-	2	2	3	-
CO2	3	2	1	1	3	-	2	2	2	1	-	2	2	3	-
CO3	3	2	1	1	3	-	2	2	2	1	-	2	2	3	-
CO4	2	1	-	-	3	-	2	2	2	1	-	2	2	3	-

1) 5) 2) 6) 

3) S. Anuradha

7)

4) 

8)

## ADVANCED COMMUNICATIONS LABORATORY

B.Tech. III Year II Semester

L T P C  
0 0 2 1**Note: Minimum of Ten experiments should be conducted using MATLAB / Any Open Source Software:**

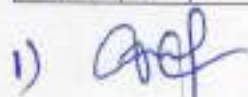
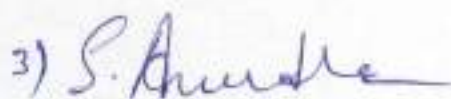
1. Determination of the convolution Encoder's output for a given sequence.
2. Determination of the convolution Decoder's output for a given sequence.
3. Implementation of Matched Filters.
4. Optimum receiver for the AWGN channel
5. Simulation of ASK system
6. BPSK Modulation and Demodulation techniques
7. QPSK Modulation and Demodulation techniques
8. Simulation of DPSK system
9. DQPSK Modulation and Demodulation techniques
10. Simulation of MSK.
11. QAM Modulation and Demodulation techniques
12. Simulation of OFDM generation and detection

**Course Outcomes:**

1. Understand the features of Spectrum Analyzer.
2. Analyze to select coding techniques for efficient transmission & reception.
3. Demonstrate and simulate various modulation and demodulation techniques.
4. Simulate the Multiplexing technique.

**CO-PO/PSO Mapping:**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	1	-	-	-	-	-	-	1	2	2	-
CO2	3	3	2	2	2	-	-	-	-	-	-	1	2	2	-
CO3	3	2	1	1	2	-	-	-	-	-	-	1	2	2	-
CO4	3	2	1	1	1	-	-	-	-	-	-	1	2	2	-

1) 5) 2) 6) 3) 

7)

4) 

8)

## MICROWAVE AND OPTICAL COMMUNICATIONS LABORATORY

B.Tech IV Year I Semester

L T P C

0 0 4 2

Note: Any ten of the following experiments

## List of Experiments:

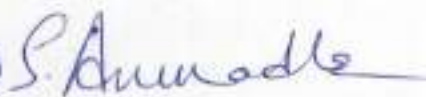
1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation measurement
4. Directional coupler Characteristics.
5. Scattering parameters of wave guide components
6. Frequency measurement.
7. Impedance measurement
8. VSWR measurement
9. Characterization of LED.
10. Characterization of Laser Diode.
11. Measurement of losses for Optical link
12. Study of fiber optic communication link.

Course Outcomes: After completion of the course the student is able to:

1. Demonstrate a microwave bench for measuring microwave parameters
2. Measure parameters like attenuation, VSWR etc.
3. Analyze the characteristics of all microwave engineering components
4. Demonstrate the mechanism of light propagation through optical fibres

## CO-PO/PSO Mapping:

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	2	-	-	2	2	1	-	-	1	2	2	-
CO2	3	3	3	2	-	-	2	2	1	-	-	1	2	2	-
CO3	3	3	2	2	-	-	2	2	1	-	-	1	2	2	-
CO4	2	1	-	2	-	-	2	2	1	-	-	1	2	2	-

1) 5) 2) 6) 3) 

7)

4) 

8)

## MICROPROCESSORS & MICROCONTROLLERS LAB

III Year B.Tech. EEE II-Sem

L T P C

00 21

**Prerequisites:** Digital Electronics, Microprocessors and Microcontrollers

**Course Objectives:**

- To develop an understanding of the operations of microprocessors and micro controllers;
- To develop assembly language programming to perform various applications.
- To understand the interfacing of various external devices to the processor and controllers.

The following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

**List of Experiments:**

1. Programs for 16-bit arithmetic operations 8086(using various addressing modes)
2. Programs for sorting an array for 8086.
3. Programs for searching for a number of characters in a string for 8086.
4. Programs for string manipulation for 8086.
5. Programs for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessor kits using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify Timer/Counter in 8051.
12. Program and verify interrupt handling in 8051.
13. UART operation in 8051.
14. Communication between 8051 kit and PC
15. Interfacing LCD to 8051
16. Interfacing Matrix/Keyboard to 8051
17. Data transfer from peripheral to memory through DMA controller 8237/8257


**Course Outcomes:** At the end of this course, students will be able to:

1. Understands the internal architecture and organization of 8086, 8051 and ARM processors/controllers.
2. Understands the interfacing techniques of 8086 and 8051.
3. Develop assembly language programming to design microprocessor/ micro controller-based systems.
4. Develop programs for interfacing various external devices,

**CO-PO/PSO Mapping**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	-	-	-	-	-	-	1	2	2	-
CO2	3	3	3	3	3	-	-	-	-	-	-	1	3	2	-
CO3	3	3	3	3	3	-	-	-	-	-	-	1	2	1	-
CO4	3	3	3	3	3	-	-	-	-	-	-	1	3	3	-

1) 

4)  7)

2) 

5)  8)

3) 

6) 



**VAAGDEVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**ELECTRONICS & COMMUNICATION ENGINEERING**  
**COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-23)

**I YEAR I SEMESTER**

S.No.	Course Code	Title of the Course	L	T	P	Credits
1		Matrices and Calculus	3	1	0	4
2		Applied Physics	3	1	0	4
3		C Programming for Engineers	3	0	0	3
4		Engineering Workshop	0	1	3	2.5
5		English for Skill Enhancement	2	0	0	2
6		Elements of Electronics and Communication Engineering	0	0	2	1
7		Applied Physics Laboratory	0	0	3	1.5
8		English Language and Communication Skills Laboratory	0	0	2	1
9		C Programming for Engineers Laboratory	0	0	2	1
10		Environmental Science	3	0	0	0
11		Induction Programme				
<b>Total Credits</b>			<b>14</b>	<b>3</b>	<b>12</b>	<b>20</b>

**I YEAR II SEMESTER**

S.No	Course Code	Title of the Course	L	T	P	Credits
1		Ordinary Differential Equations and Vector Calculus	3	1	0	4
2		Engineering Chemistry	3	1	0	4
3		Computer Aided Engineering Graphics	1	0	4	3
4		Basic Electrical Engineering	2	0	0	2
5		Electronic Devices and Circuits	2	0	0	2
6		Applied Python Programming Laboratory	0	1	2	2
7		Engineering Chemistry Laboratory	0	0	2	1
8		Basic Electrical Engineering Laboratory	0	0	2	1
9		Electronic Devices and Circuits Laboratory	0	0	2	1
<b>Total Credits</b>			<b>11</b>	<b>3</b>	<b>12</b>	<b>20</b>

1) *[Signature]*  
 2) *[Signature]*

3) *[Signature]*

4) *[Signature]*

5) *[Signature]*

6) *[Signature]*

7)

8)



**VAAGDEVI COLLEGE OF ENGINEERING (AUTONOMOUS)  
ELECTRONICS & COMMUNICATION ENGINEERING  
COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-23)

**II YEAR I SEMESTER**

S. No.	Course Code	Title of the Course	L	T	P	Credits
1		Numerical Methods and Complex Variables	3	1	0	4
2		Analog Circuits	3	0	0	3
3		Network analysis and Synthesis	3	0	0	3
4		Digital Logic Design	3	0	0	3
5		Signals and Systems	3	1	0	4
6		Analog Circuits Laboratory	0	0	2	1
7		Digital logic Design Laboratory	0	0	2	1
8		Basic Simulation Laboratory	0	0	2	1
9		Logical Reasoning & Quantitative Aptitude	3	0	0	0
<b>Total Credits</b>			<b>18</b>	<b>2</b>	<b>6</b>	<b>20</b>

**II YEAR II SEMESTER**

S. No.	Course Code	Title of the Course	L	T	P	Credits
1		Probability Theory and Stochastic Processes	3	0	0	3
2		Electromagnetic Fields and Transmission Lines	3	0	0	3
3		Analog and Digital Communications	3	0	0	3
4		Linear and Digital IC Applications	3	0	0	3
5		Electronic Circuit Analysis	3	0	0	3
6		Analog and Digital Communications Laboratory	0	0	2	1
7		Linear and Digital IC Applications Laboratory	0	0	2	1
8		Electronic Circuit Analysis Laboratory	0	0	2	1
9		Real Time Project/ Field Based Project	0	0	4	2
10		Gender Sensitization Lab	0	0	2	0
<b>Total Credits</b>			<b>15</b>	<b>0</b>	<b>12</b>	<b>20</b>

1) *[Signature]*

2) *[Signature]*

3) *[Signature]*

4) *[Signature]*

5) *[Signature]*

6) *[Signature]*

7)

8)





**VAAGDEVI COLLEGE OF ENGINEERING (AUTONOMOUS)  
ELECTRONICS & COMMUNICATION ENGINEERING  
COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-23)

**III YEAR I SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1		Microcontrollers	3	1	0	4
2		IoT Architectures and Protocols	3	0	0	3
3		Control Systems	3	1	0	4
4		Business Economics & Financial Analysis	3	0	0	3
5		Professional Elective - I	3	0	0	3
6		Microcontrollers Laboratory	0	0	2	1
7		IoT Architectures and Protocols Laboratory	0	0	2	1
8		Advanced English Communication Skills Laboratory	0	0	2	1
9		Intellectual Property Rights	3	0	0	0
<b>Total Credits</b>			<b>18</b>	<b>2</b>	<b>6</b>	<b>20</b>

**III YEAR II SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1		Antennas and Wave Propagation	3	0	0	3
2		Digital Signal Processing	3	0	0	3
3		CMOS VLSI Design	3	0	0	3
4		Professional Elective - II	3	0	0	3
5		Open Elective - I	3	0	0	3
6		Digital Signal Processing Laboratory	0	0	2	1
7		CMOS VLSI Design Laboratory	0	0	2	1
8		Advanced Communication Laboratory	0	0	2	1
9		Industry Oriented Mini Project/ Internship	0	0	4	2
10		Environmental Science	3	0	0	0
<b>Total Credits</b>			<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

1)

5)

2)

6)

3)

7)

4)

8)



**VAAGDEVI COLLEGE OF ENGINEERING (AUTONOMOUS)  
ELECTRONICS & COMMUNICATION ENGINEERING  
COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-23)

**IV YEAR I SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1		Microwave and Optical Communications	3	1	0	4
2		Professional Elective – III	3	0	0	3
3		Professional Elective – IV	3	0	0	3
4		Open Elective – II	3	0	0	3
5		Professional Practice, Law & Ethics	2	0	0	2
6		Microwave and Optical Communications Laboratory	0	0	4	2
7		Project Stage – I	0	0	6	3
<b>Total Credits</b>			<b>15</b>	<b>1</b>	<b>10</b>	<b>20</b>

**IV YEAR II SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1		Professional Elective – V	3	0	0	3
2		Professional Elective – VI	3	0	0	3
3		Open Elective – III	3	0	0	3
4		Project Stage – II including Seminar	0	0	22	11
<b>Total Credits</b>			<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>

**Professional Elective – I**

	Computer Organization & Operating Systems
	Data Communications and Computer Networks
	Electronic Measurements and Instrumentation

**Professional Elective – II**

	Digital Image Processing
	Mobile Communications and Networks
	Embedded System Design

- |                    |                    |
|--------------------|--------------------|
| 1) Prof            | 5) <del>Prof</del> |
| 2) <del>Prof</del> | 6) <del>Prof</del> |
| 3) S. Anuradha     | 7)                 |
| 4) <del>Prof</del> | 8)                 |



**VAAGDEVI COLLEGE OF ENGINEERING (AUTONOMOUS)  
ELECTRONICS & COMMUNICATION ENGINEERING  
COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-23)

**Professional Elective – III**

	Radar Systems
	CMOS Analog IC Design
	Artificial Neural Networks

**Professional Elective – IV**

	Network Security and Cryptography
	Satellite Communications
	Biomedical Instrumentation

**Professional Elective – V**

	Artificial Intelligence
	5G and beyond Communications
	Machine learning

**Professional Elective – VI**

	Multimedia Database Management Systems
	System on Chip Architecture
	Wireless sensor Networks

**Open Electives**

Open Elective (OE – I)	Open Elective (OE – II)	Open Elective (OE – III)
1. Fundamentals of Internet of Things	1. Electronic Sensors	1. Measuring Instruments
2. Principles of Signal Processing	2. Electronics for Health Care	2. Communication Technologies
3. Digital Electronics for Engineering	3. Telecommunications for Society	3. Fundamentals of Social Networks

1)

2)

3) S. Anuradha

4)

5)

6)

7)

8)



# VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), www.vaagdevi.edu.in

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Date: 27-01-2024.

## BOARD OF STUDIES MEETING

Minutes of the meeting of Board of Studies for Electrical and Electronics Engineering department held on 27-01-2024 at 11:00 A.M.

Ref: In-Continuation with Departmental BOS Meeting held on 25-01-2024.

Sl.No.	Name of the Address	Designation	Signature
1	Dr. P. Sadanandam Associate Professor, Department of EEE, VCE, Warangal.	Chairperson	
2	Dr. A. Jayalaxmi Professor of EEE Department, JNTUH, CEH <i>Director UGC Appoint</i>	Member (University Nominee)	
3	Dr. G. Yesurathnam Professor, EE Department, Osmania University, Hyderabad.	Member (Subject Expert)	
4	Dr. Ch. Ranulu Assistant Professor, EE Department, NIT, Warangal.	Member (Subject Expert)	
5	Sri Murali Mohan Gade Scientist 'F', Directorate of Systems, DRDL, Hyderabad.	Member (Representative from Industry)	
6	Dr. K. Prakash Professor, Department of EEE, VCE, Warangal.	Member (Faculty)	
7	Mr. P. Purna Chander Rao Associate Professor, Department of EEE, VCE, Warangal.	Member (Faculty)	
8	Dr. K. Ranjith Kumar Assistant Professor, Department of EEE, VCE, Warangal.	Member (Faculty)	
9	Mr. N. Mahender A.E, TS NPDCL, Warangal.	Member (Representative from Alumni)	

### The following decisions are taken:

1. Approved the course structure and syllabi of B.Tech (R22-Regulations) for III-Year and IV-Year (I and II Semesters).
2. Approved the correction of few course codes of the R20 Regulations due to repetition.(Enclosed)
3. Approved the substitute subjects for the students who have been readmitted from R18 Regulations into R22 Regulations and R20 Regulations into R22 Regulations.(Enclosed)
4. Approved the internal Department BOS meeting minutes.

Dr. P. Sadanandam  
(BOS- Chairperson)

**VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL**  
**UGC-AUTONOMOUS**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**COURSE STRUCTURE & SYLLABUS**  
**(R22 Regulations)**  
**Applicable from AY 2022-23 Batch**

**III Year I Semester**

Sl.No	Course Code	Course Title	L	T	P	Credits
1		Power Electronics	3	1	0	4
2		Control Systems	3	0	0	3
3		Signals and Systems	3	1	0	4
4		Professional Elective-I	3	0	0	3
5		Business Economics and Financial Analysis	3	0	0	3
6		Power Electronics Laboratory	0	0	2	1
7		Control Systems Laboratory	0	0	2	1
8		Advanced English Communication Skills Laboratory	0	0	2	1
9		Intellectual Property Rights	3	0	0	0
		<b>Total Credits</b>	<b>18</b>	<b>2</b>	<b>6</b>	<b>20</b>

**III Year II Semester**

Sl.No	Course Code	Course Title	L	T	P	Credits
1		Open Elective-I	3	0	0	3
2		Professional Elective-II	3	0	0	3
3		Microprocessors & Microcontrollers	3	0	0	3
4		Power System Protection	3	0	0	3
5		Power System Operation and Control	3	0	0	3
6		Power System Laboratory	0	0	2	1
7		Microprocessors & Microcontrollers Laboratory	0	0	2	1
8		Electronics Design Laboratory	0	0	2	1
9		Industry Oriented Mini Project/ Internship	0	0	4	2
10		Environmental Science	3	0	0	0
		<b>Total Credits</b>	<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

\*MC609 - Environmental Science – Should be Registered by Lateral Entry Students Only.

1 *[Signature]* 2 *[Signature]* 3 *[Signature]* 4 *[Signature]* 5  
 6 *[Signature]* 7 *[Signature]* 8 *[Signature]* 9

**VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL**  
**UGC-AUTONOMOUS**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**COURSE STRUCTURE & SYLLABUS**  
**(R22 Regulations)**  
**Applicable from AY 2022-23 Batch**

**IV Year I Semester**

Sl.No	Course Code	Course Title	L	T	P	Credits
1		Power Electronic Applications to Renewable Energy Systems	3	1	0	4
2		Open Elective-II	3	0	0	3
3		Professional Elective-III	3	0	0	3
4		Professional Elective-IV	3	0	0	3
5		Management and Organizational Behavior	2	0	0	2
6		Simulation of Renewable Energy Systems Laboratory	0	0	4	2
7		Project Stage - I	0	0	6	3
		<b>Total Credits</b>	<b>14</b>	<b>1</b>	<b>10</b>	<b>20</b>

**IV Year II Semester**

Sl.No	Course Code	Course Title	L	T	P	Credits
1		Open Elective-III	3	0	0	3
2		Professional Elective-V	3	0	0	3
3		Professional Elective-VI	3	0	0	3
4		Project Stage - II	0	0	22	9
5		Technical Seminar	0	0	0	2
		<b>Total Credits</b>	<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>

\*MC - Satisfactory/Unsatisfactory Professional Elective - I

1 *Enr* 2 *AS* 3 *epu* 4 *Am* 5  
 6 *Prady* 7 *AS* 8 *Prady* 9

**VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL**  
**UGC-AUTONOMOUS**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**COURSE STRUCTURE & SYLLABUS**  
**(R22 Regulations)**  
**Applicable from AY 2022-23 Batch**

**Professional Elective-I**

1	Renewable Energy Systems
2	High Voltage Engineering
3	Computer Aided Electrical Machine Designs
4	Electrical Engineering Materials

**Professional Elective-II**

1	Flexible AC Transmission Systems
2	Power Semiconductor Drives
3	Digital Signal Processing
4	Advanced Control Systems

**Professional Elective-III**

1	Advanced Power Electronics
2	HVDC Transmission
3	Electric and Hybrid Vehicles
4	Utilization of Electrical Energy

**Professional Elective-IV**

1	Advanced Electrical Drives
2	Soft Computing Techniques
3	VLSI Design
4	IoT Applications in Electrical Engineering

**Professional Elective-V**

1	Power Quality
2	Solar Power Batteries
3	AI Techniques in Electrical Engineering
4	Embedded Systems Applications

**Professional Elective-VI**

1	Smart Grid Technologies
2	Electrical Distribution Systems
3	Digital Control Systems
4	Machine Learning Applications to Electrical Engineering

1 *Rm*      2 *AS*      3 *gys*      4 *ds*      5  
6 *hndy*      7 *gpo*      8 *Dgim*      9

**VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL**  
**UGC-AUTONOMOUS**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**COURSE STRUCTURE & SYLLABUS**  
**(R22 Regulations)**  
**Applicable from AY 2022-23 Batch**

**Open Elective-I**

1		Concepts of Control Systems
2		Fundamental of Electric Vehicles

**Open Elective-II**

1		Electric Power Utilization & Safety
2		Energy Storage Systems

**Open Elective-III**

1		Charging Infrastructure for Electric Vehicles
2		Reliability Engineering

1 CVS    2 AS    3 egv    4 AS    5  
 6 Reliability    7 CVS    8 Digital    9





# VAAGDEVI COLLEGE OF ENGINEERING

UGC-Autonomous

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), [www.vaagdevi.edu.in](http://www.vaagdevi.edu.in)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

## ITEM-2

The following are subjects of R-20 with new subject codes

Sl. No.	Course title	Existing code	Corrected code
1	Electrical Engineering Practice Lab	B20EE05	B20EE05
2	Electrical Circuits - II	B20EE05	B20EE56
3	Electrical Machines Lab - I	B20EE15	B20EE15
4	Electrical Machines - III	B20EE15	B20EE57
5	Renewable Energy Systems (Open Elective)	B20EE56	B20EE19

1 *[Signature]*

2 *[Signature]*

3 *[Signature]*

4 *[Signature]*

5

6 *[Signature]*

7 *[Signature]*

8 *[Signature]*



**VAAGDEVI COLLEGE OF ENGINEERING**  
**UGC-Autonomous**

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), [www.vaagdevi.edu.in](http://www.vaagdevi.edu.in)

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**ITEM-3**

The following Transitory Rules will be in force for the students who have re-admitted from R20 Regulation into R22 Regulation.

Branch	Year & Semester	Subjects studied in R20 and repeated Subjects in R22	Credits	Substitute subjects for R22	Credits
EEE	III - I	Signals and Systems	03	Power Systems-II	03
	III - II	Nil	-	Nil	-
	IV - I	Nil	-	Nil	-
	IV - II	Nil	-	Nil	-

The following Transitory Rules will be in force for the students who have re-admitted from R18 Regulation into R22 Regulation.

Branch	Year & Semester	Subjects studied in R18 and repeated Subjects in R22	Credits	Substitute subjects for R22	Credits
EEE	III - I	Control Systems	03	Solid Mechanics & Hydraulic Machines	04
	III - II	Power System Protection	03	Solid Mechanics & Hydraulic Machines	04
	IV - I	Nil	-	Nil	-
	IV - II	Nil	-	Nil	-

1 *eg*

2 *AS*

3 *eg*

4 *AS*

5

6 *Antony*

7 *eg*

8 *Djimu* 9

**VAAGDEVI COLLEGE OF ENGINEERING**  
**AUTONOMOUS**

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S)

**DEPARTMENT OF MECHANICAL ENGINEERING**

**BOARD OF STUDIES MEETING**

Minutes of meeting of Board of studies in Mechanical Engineering held on **29-01-2024** at  
**04.00 PM**

**Members Present:**

S.No	Name and Address	Designation	Signature
1	Dr. P.Srinivasulu Head, MED, VCE, Warangal	Chairman	
2	Dr.E.Ramjee Professor, MED, JNTUH CEH	Member (Univ. Nominee)	
3	Mr.H.Yedukondala Rao DGM, Sriram Fuel Injection Works, Hyd.	Member (Representative from Industry)	
4	Dr.Y.Ravi Kumar Professor, MED, NIT, Warangal	Member (Subject Expert)	
5	Dr. L. Siva Rama Krishna Professor, MED, UCE, Osmania University, Hyd	Member (Subject Expert)	
6	Mr. Y. Umashankar Asst.Prof, MED, VCE, Warangal	Member (Teacher of the College)	
7	Ms. SD. Ruksar Begum Asst.Prof, MED, VCE, Warangal	Member (Teacher of the College)	
8	Mr. M. Anil Kumar Asst.Prof, MED, VCE, Warangal	Member (Teacher of the College)	
9	Mr. B.Akhil Graduate Trainee Engineer Hyundai Motor India Engineering, Hyd	Member (Representative from Alumni)	

**The following decisions are taken:**

1. Approved the Course structure of B.Tech III & IV Year (I-Semester & II-Semesters) under R22-Regulations.
2. Approved the Syllabus of B.Tech III & IV Year (I-Semester & II-Semester) under R22-Regulations.
3. Approved the substitute/additional subjects for R18 & R20 regulations students those who have been Re-admitted into R22 Regulation.

  
**CHAIRMAN**  
Board of studies



# VAAGDEVI COLLEGE OF ENGINEERING

(Autonomous)

Bollikunta, Khila Warangal (Mandal), Warangal Urban - 506 005 (T.S)

## DEPARTMENT OF MECHANICAL ENGINEERING

### SUBSTITUTE/ADDITIONAL SUBJECTS FOR READMITTED STUDENTS

The following substitute and additional subjects will be in force for the students who have been readmitted from R18 Regulation into R22 Regulation (III & IV Year).

Branch	Year & Semester	Subjects studied in R18 and repeated Subjects in R22	Substitute/Additional subjects for R22
Mechanical Engineering	III - I	Nil	Nil
	III - II	Nil	Environmental Sciences (Additional Subject)
	IV - I	Refrigeration & Air-Conditioning (III - II) (Professional Elective - II)	Computational Fluid Dynamics
		Industrial Management (III-II) (Open Elective- II)	Entrepreneurship Development
	IV - II	Robotics (IV-I) (Professional Elective - IV)	Design for Manufacturing

1 *[Signature]*

2 *[Signature]*

3

4 *[Signature]*

5 *[Signature]*

6 *[Signature]*

7 *[Signature]*

8 *[Signature]*

9 *[Signature]*



**VAAGDEVI COLLEGE OF ENGINEERING**  
(AUTONOMOUS)  
**MECHANICAL ENGINEERING**

**COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-2023)

**III YEAR I SEMESTER**

S. No.	Course Code	Title of the Course	L	T	P	Credits
1	B22ME20	Dynamics of Machinery	3	0	0	3
2	B22ME21	Design of Machine Elements	3	0	0	3
3	B22ME22	Metrology & Machine Tools	3	0	0	3
4	B22MB01	Business Economics & Financial Analysis	3	0	0	3
5	B22ME23	Steam Power & Jet Propulsion	3	0	0	3
6	B22ME24	CAD/CAM	2	0	0	2
7	B22ME25	Thermal Engineering Laboratory	0	0	2	1
8	B22ME26	Metrology & Machine Tools Laboratory	0	0	2	1
9	B22ME27	Kinematics & Dynamics Laboratory	0	0	2	1
10	B22MB06	Intellectual Property Rights	3	0	0	0
<b>Total</b>			<b>20</b>	<b>0</b>	<b>6</b>	<b>20</b>

**III YEAR II SEMESTER**

S. No.	Course Code	Title of the Course	L	T	P	Credits
1	B22ME28	Machine Design	3	0	0	3
2	B22ME29	Heat Transfer	3	0	0	3
3	B22ME30	Finite Element Methods	3	0	0	3
4		Professional Elective-I	3	0	0	3
5		Open Elective-I	3	0	0	3
6	B22ME35	Heat Transfer Lab	0	0	2	1
7	B22ME36	Computer Aided Engineering Laboratory	0	0	2	1
8	B22EN03	Advanced English Communication Skills Laboratory	0	0	2	1
9	B22ME37	Industry Oriented Mini Project/Internship	0	0	4	2
10	B22CH03	Environmental Sciences	3	0	0	0
<b>Total</b>			<b>18</b>	<b>0</b>	<b>10</b>	<b>20</b>

Environmental Science in IIIYr IISem Should be Registered by Lateral Entry Students

Only

1 *Parthiv*

2 *E 22*

3

4 *> D<sup>o</sup> 6*

5 *(Handwritten)*

6 *Shay*

7 *Juraf*

8 *M (Handwritten)*

9 *BA (Handwritten)*

**VAAGDEVI COLLEGE OF ENGINEERING  
(AUTONOMOUS)  
MECHANICAL ENGINEERING**

**COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-2023)

**IV YEAR I SEMESTER**

S. No.	Course Code	Title of the Course	L	T	P	Credits
1		Industrial Management	2	0	0	2
2	B22ME38	Refrigeration & Air Conditioning	3	0	0	3
3		Professional Elective-II	3	0	0	3
4		Professional Elective-III	3	0	0	3
5		Professional Elective-IV	3	0	0	3
6		Open Elective-II	3	0	0	3
7	B22ME51	Project Stage-I	0	0	6	3
<b>Total</b>			<b>17</b>	<b>0</b>	<b>6</b>	<b>20</b>

**IV YEAR II SEMESTER**

S. No.	Course Code	Title of the Course	L	T	P	Credits
1		Professional Elective-V	3	0	0	3
2		Professional Elective-VI	3	0	0	3
3		Open Elective-III	3	0	0	3
4	B22ME60	Project Stage-II including seminar	0	0	22	11
<b>Total</b>			<b>9</b>	<b>0</b>	<b>22</b>	<b>20</b>

1 *PA*

2 *E-2*

3

4 *> R<sup>o</sup> 6*

5 *h*  
*(AS)*

6 *Shy*

7 *Quest*

8 *M*

9 *B.A.*

**VAAGDEVI COLLEGE OF ENGINEERING  
(AUTONOMOUS)  
MECHANICAL ENGINEERING**

**COURSE STRUCTURE**

(R22 Regulations applicable for the batches admitted from Academic Year 2022-2023)

**PROFESSIONAL ELECTIVES OFFERED IN R22**

**Professional Elective-I**

B22ME31	Unconventional Machining Processes
B22ME32	Production Planning & Control
B22ME33	Operations Research
B22ME34	Microprocessors in Automation

**Professional Elective-II**

B22ME39	Additive Manufacturing
B22ME40	Automation in Manufacturing
B22ME41	Artificial Intelligence in Mechanical Engineering
B22ME42	Mechatronics

**Professional Elective-III**

B22ME43	Power plant Engineering
B22ME44	Automobile Engineering
B22ME45	Non-Conventional Energy Sources
B22ME46	Solar Energy Technology

**Professional Elective-IV**

B22ME47	Re-Engineering
B22ME48	Computational Fluid Dynamics
B22ME49	Turbo Machinery
B22ME50	Fluid Power System

**Professional Elective-V**

B22ME52	Industrial Robotics
B22ME53	Mechanical Vibrations
B22ME54	Composite Materials
B22ME55	Energy Conservation and Management

1 Parting      2 E 2nd      3  
 4 > 02° b      5 6 (ARISE)      6 Long  
 7 June      8 M. Chyly      9 B. 2022



### Professional Elective-VI

B22ME56	Industry4.0
B22ME57	Fuzzy Logic and ANN
B22ME58	Electric and Hybrid Vehicles
B22ME59	Total Quality Management

### Open Electives offered to other Departments

S.No	Course Code	Title of the Course	L	T	P	C
1	B22ME61	Non Conventional Energy Sources	3	0	0	3
2	B22ME62	Industrial Robotics	3	0	0	3
3	B22ME63	Mechatronics	3	0	0	3
4	B22ME64	3D Printing Technology	3	0	0	3

1 *PS* 2 *E* 3

4 *> P* 5 *b* 6 *Shay*

7 *June* 8 *M* 9 *B. A. P.*

**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**BOLLIKUNTA, WARANGAL**

**THERMAL ENGINEERING LAB**

**B. TECH - III Year I Sem:**

**L/T/P/C**

**Pre-Requisite: Thermodynamics & Thermal Engineering - I**

**0/0/2/1**

**Objective:** To understand the working principles of IC Engines, Compressors.

**List of Experiments**

1. I.C. Engines Valve / Port Timing Diagrams
2. I.C. Engines Performance Test for 4 Stroke SI engines
3. I.C. Engines Performance Test for 2 Stroke SI engines
4. I.C. Engines Morse, Retardation, Motoring Tests
5. I.C. Engine Heat Balance – CI/SI Engines
6. I.C. Engines Economical speed Test on a SI engine
7. I.C. Engines effect of A/F Ratio in a SI engine
8. Performance Test on Variable Compression Ratio Engine
9. IC engine Performance Test on a 4S CI Engine at constant speed
10. Volumetric efficiency of Air – Compressor Unit
11. Dis-assembly / Assembly of Engines
12. Study of Boilers

**Note:** Perform a minimum of any 10 out of the 12 Exercises.

**COURSE OUTCOMES:**

The students will be able to

1. Identify various types of engines and their parts.
2. Understand the power of different engine and where they can be used.
3. Estimate the performance of different engine and analyze them.
4. Analyze engines to set better efficiencies by knowing Brake specific fuel consumption of the engines.

1 *Port Timing*

2 *E 2W*

3

4 *→ D<sup>o</sup> b ✓*

5 *h  
ANALYSIS*

← *Shy*

7 *Quercat*

8 *M 2W*

9 *Brake sp*

**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**BOLLIKUNTA, WARANGAL**

**METROLOGY & MACHINE TOOLS LAB**

**B. TECH -III Year I Sem:**

**L/T/P/C**

**0/0/2/1**

**Prerequisites:** Theoretical exposure to Metrology and machine tools.

**Course Objectives:**

1. To impart practical exposure to the metrology equipment & Machine Tools
2. To conduct experiments and understand the working of the same.

**List of Experiments:**

1. Step turning on lathe machine
2. Taper turning on lathe machine
3. Thread cutting and knurling on lathe machine (2 exercises)
4. Measurement of cutting forces on lathe
5. Machining of holes using Drilling and boring machines.
6. Gear cutting on the Milling machine
7. Grinding of Tool angles using Cylindrical / Surface Grinding
8. Measurement of lengths, heights, diameters by Vernier calipers, micrometers.
9. Measurement of Diameter of bores by internal micrometers and dial bore indicators.
10. Use of gear teeth Vernier calipers for checking the chordal addendum and chordal height of the spur gear.
11. Angle and taper measurements by bevel protractor and sine bars.
12. Thread measurement by 2-wire and 3-wire methods.
13. Surface roughness measurement by Tally Surf.
14. Use of mechanical comparator

**Note:** Perform a minimum of any 10 out of the 14 Exercises.

**COURSE OUTCOMES:**

After completion of the course, the student will be able to

1. Identify parts of Lathe and perform different operations on Lathe
2. Identify parts of drilling machine and perform operations on drilling machine
3. Identify parts of Milling Shaping and Planning machine and perform operations on Milling, Shaping and Planning machine and Measure surface finish of machined components.
4. Identify various measuring instruments and use them appropriately.

1. Particular  
4.  $\rightarrow D^2 b$   
7. Surface  
2. E  
5.  $\frac{b}{\text{cancel}}$   
8. M. P. R. S.  
3.  
6. Chy  
9. B. A. H. P.

**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**BOLLIKUNTA, WARANGAL**

**KINEMATICS & DYNAMICS LAB**

**B. TECH -III Year I SEM:**

**L/T/P/C**  
**0/0/2/1**

**Pre-requisites:** Kinematics of Machinery & Dynamics of Machinery

**Course Objectives:** The objective of the lab is to understand the kinematics and dynamics of mechanical elements such as linkages, gears, cams and learn to design such elements to accomplish desired motions or tasks.

**List of Experiments:** (A Minimum of 10 experiments are to be conducted)

1. To determine the state of balance of machines for primary and secondary forces
2. To determine the frequency of Torsional vibration of a given rod
3. Determine the effect of varying mass on the centre of sleeve in porter and Proell governor
4. Find the motion of the follower of the given profile of the cam
5. The balance masses statically and dynamically for single rotating mass systems
6. Determine the critical speed of a given shaft for different n-conditions
7. For a simple pendulum determine time period and its natural frequency
8. For a compound pendulum determine time period and its natural frequency
9. Determine the effect of gyroscope for different motions
10. Determine time period, amplitude and frequency of undamped free longitudinal vibration of single degree spring mass systems.
11. Determine the pressure distribution of lubricating oil at various load and speed of a Journal bearing.
12. Determine time period, amplitude and frequency of damped free longitudinal vibration of single degree spring mass systems.

**Note:** Perform a minimum of any 10 out of the 12 Exercises

**COURSE OUTCOMES:**

Students should be able to:

1. Understand types of motion
2. Analyze forces and torques of components in linkages
3. Understand static and dynamic balance
4. Understand forward and inverse kinematics of open-loop mechanisms

1 Porter  
4  $\rightarrow D^2 b$   
7 Governor

2 E  
5  
8 M

3  
6 Shay  
9 B

**VAAGDEVI COLLEGE OF ENGINEERING**  
**(AUTONOMOUS)**  
**BOLLIKUNTA, WARANGAL**

**HEAT TRANSFER LAB**

**B. TECH – III Year II Sem:**

**L/T/P/C**

**0/0/2/1**

**Pre-requisite: Thermodynamics**

**Course Objectives:** To enable the student to apply conduction, convection and radiation heat transfer concepts to practical applications

**List of Experiments:** (Minimum ten experiments from the following are to be conducted)

1. Composite Slab Apparatus – Overall heat transfer co-efficient.
2. Heat transfer through lagged pipe.
3. Heat Transfer through a Concentric Sphere
4. Thermal Conductivity of given metal rod.
5. Heat transfer in pin-fin
6. Experiment on Transient Heat Conduction
7. Heat transfer in forced convection apparatus.
8. Heat transfer in natural convection
9. Parallel and counter flow heat exchanger.
10. Emissivity apparatus.
11. Stefan Boltzmann Apparatus.
12. Critical Heat flux apparatus.
13. Study of heat pipe and its demonstration.
14. Film and Drop wise condensation apparatus

**COURSE OUTCOMES:**

Student will be able to

1. Perform steady state & Transient heat conduction experiments to estimate thermal conductivity of different materials
2. Estimate heat transfer coefficients in forced convection, free convection, condensation and correlate with theoretical values
3. Obtain variation of temperature along the length of the pin fin under forced and free convection
4. Perform radiation experiments: Determine surface emissivity of a test plate and Stefan-Boltzmann's constant and compare with theoretical value

1 *P. Anil Kumar*

2 *E. J. Reddy*

3

4 *S. D. Reddy*

5 *K. Anil Kumar*

6 *S. Jayaram*

7 *S. Anil Kumar*

8 *M. Anil Kumar*

9. *B. Anil Kumar*

**VAAGDEVI COLLEGE OF ENGINEERING  
(AUTONOMOUS)  
BOLLIKUNTA, WARANGAL**

**COMPUTER AIDED ENGINEERING LAB**

**B. TECH -III Year II Sem:**

**L/T/P/C**

**0/0/2/1**

**Course Objectives:**

1. To be able to understand and handle design problems in a systematic manner.
2. To be able to apply CAD in real life applications.
3. To understand the basic principles of different types of analysis.

**List of Experiments:**

**Note: Conduct any TEN exercises from the list given below:**

1. Drafting: Development of part drawings for various components in the form of orthographic and isometric. Representation of dimensioning and tolerances.
2. Part Modeling: Generation of various 3D Models through Protrusion, revolve, sweep. Creation of various features. Study of parent child relation. Feature based and Boolean based modeling and Assembly Modeling. Study of various standard Translators. Design of simple components.
3. Determination of deflection and stresses in 2D and 3D trusses and beams.
4. Determination of deflections, principal and Von-Mises stresses in plane stress, plane strain and Axi-symmetric components.
5. Determination of stresses in 3D and shell structures (at least one example in each case)
6. Estimation of natural frequencies and mode shapes, Harmonic response of 2D beam.
7. Study state heat transfer analysis of plane and axi-symmetric components.
8. Development of process sheets for various components based on Tooling and Machines.
9. Study of various post processors used in NC Machines.
10. Development of NC code for free form and sculptured surfaces using CAM software.
11. Machining of simple components on NC lathe and Mill by transferring NC Code / from CAM software.

**COURSE OUTCOMES:**

Student will be able

1. To understand the analysis of various aspects in design
2. To have exposure to usage of software tools for design and manufacturing.
3. To acquire the skills needed to analyze and simulate engineering systems.
4. To understand the machining of simple components on NC lathe & Milling Machine.

1	Practical	2	F 2w	3	
4	→ P <sup>o</sup> b ✓	5	→ <del>Practical</del>	6	Shay
7	→ <del>Practical</del>	8	M. Practical	9	→ <del>Practical</del>