Ref.No.:AITSR/CE/BOS-19/2026-27/MOM-19

Date: 10/06/2026

19th Board of Studies: Minutes of Meeting

The **19th Board of Studies meeting** of the Civil Engineering department was held on **10th June 2026 at 10:30 AM** at Seminar Hall, **Civil Block, AITS-Rajampet in online mode.** The following members were present at the meeting:

MS Teams, meeting link Link:

https://teams.microsoft.com/meet/41343939149667?p=XD2cPtxDSi7FDNsfFg

Members Present:

S.No	Name of the Member	Role in Board of Studies	Category
1	Dr. N. R. Gowthami Assistant Professor Dept. of Civil Engineering, AITS Rajampet	Member	Chairman
2	Dr. D. Gouse Peera Assistant Professor Dept. of Civil Engineering, AITS Rajampet	Member	Internal Member
3	Mr. V. Haneef Assistant Professor Dept. of Civil Engineering, AITS Rajampet	Member	Internal Member
4	Dr. M. Sree Murali Professor SV University, Tirupati	Member	Outside Subject Expert
5	Dr.STG Raghukanth Associate Professor Civil Engineering IIT Madras	Member	Outside Subject Expert
6	Prof. G. Appa Rao Professor in Civil Engineering IIT Madras, Chennai-600036, T.N.	Member	University Nominee
7	Sri. M. Krishna Reddy Retd. Chief Engineer, Panchayat Raj Dept., Andhra Pradesh Ph: 7702372660	Member	Industry Expert

1.Dr N R Gowthami	2.Dr D Gouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

8	Mr. B. V. Prudvi Raj Consultant – Planning Engineer Colliers International Property Services	Member	Alumni

Members Absent: NIL

Agenda of the Meeting:

Item No	Particulars
BoS/2026/CIVIL/19.1	**19.1** Ratification of the 18th Board of Studies Meeting Minutes (UG & PG).
BoS/2026/ CIVIL /19.2	**19.2** To discuss and finalize the course structure for IV Year B.Tech (I & II Semesters).
BoS/2026/ CIVIL /19.3	**19.3** To discuss and approve the detailed syllabus for IV Year (I & II Semesters).
BoS/2026/ CIVIL /19.4	**19.4** To review and approve the panel of Subject Experts for IV Year-I Semester.
BoS/2026/ CIVIL /19.5	**19.5** Discussion on feedback received regarding the curriculum.
BoS/2026/ CIVIL /19.6	**19.6** Any other item with permission of the Chair.

Welcome Address:

Dr. N. R. Gowthami, Chairperson, warmly welcomed all the members and conveyed heartfelt gratitude to the external experts, university nominee, industry representative, and alumni member for their gracious presence and invaluable support.

She introduced the members of the committee, making a special acknowledgment of the distinguished external experts:

- **Dr. Gangolu Appa Rao**, Professor, IIT Madras
- **Sri M. Krishna Reddy**, Retired Chief Engineer, Panchayat Raj Department, Andhra Pradesh
- **Dr. M. Sree Murali**, Professor, SVU College of Engineering, Tirupati
- **Dr. STG Raghukanth**, Associate Professor, IIT Madras

1.Dr N R Gowthami	2.Dr D Gouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

- **Mr. B.V. Pruthvi Raj**, Consultant – Planning Engineer

The Chairperson expressed appreciation for their willingness to share expertise and guidance, noting that their insights would greatly enrich the deliberations.Following the introductions, the agenda was formally presented and taken up for detailed discussion.

Deliberations and Resolutions:

Agenda Item No. BoS/2026/CIVIL/19.1: Ratification of 18thBoard of Studies Meeting minutes

The minutes were reviewed. The Board ratified the 18th Board of Studies Meeting minutes. i.e., III B.Tech-I & II semesters course structure and Syllabus and Subject experts of III B.Tech.

Agenda Item No. BoS/2026/CIVIL/19.2: Course structure for IV B.Tech of R23 Regulations:

The IV Year curriculum is well-structured, forward-looking, and industry-relevant. It integrates:

- Fundamentals + advanced electives for academic depth.
- Internships + software labs for practical exposure.
- Sustainability + AI tools for modern relevance.
- Projects + research-based courses for innovation and employability.

This design ensures graduates are equipped with knowledge, skills, and attitudes aligned with NEP-2020 and industry expectations as enclosed in Annexure-I.

Agenda Item No. BoS/2026/CIVIL/19.3: Detailed syllabus for IV Year (I & II Sem) of R23 Regulations

Dr. M. Srimurali

- Recommended adding the reference book "An Introduction to Soil Reinforcement and Geosynthetics" by G.L. Siva Kumar Babu, University Press India, 5th Edition, 2006, to strengthen academic resources.
- Advocated for advanced electives to broaden specialization.

1.Dr N R Gowthami	2.Dr D Gouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

- Reflected in Professional Electives (PE-4 & PE-5) such as Geo-synthetics and Reinforced Earth Structures (23A017AT), Ground Improvement Techniques (23A017DT), and Transportation Economics (23A017FT).

Sri M. Krishna Reddy

- Insisted on industry-oriented courses, internships, sustainable materials, and site exposure.
- Addressed through Evaluation of Industry Internship (23A0173I) and the Mandatory Community Service Project Internship (08 weeks).
- Sustainability integrated via Open Electives like Environmental Impact Assessment (23A017HT) and Solid Waste Management (23A017JT).

Dr. Gangolu Appa Rao,

- Suggested strengthening fundamentals with practical exposure and analytical components.
- Reflected in Finite Element Analysis (23A0171T), which emphasizes analytical modeling, stiffness matrices, and numerical methods.
- Strong focus on problem-solving and analytical skills in CO-PO mapping.

Dr. STG Raghukanth,

- Advocated for enhancing analytical and research-oriented aspects.
- Addressed through Experimental Stress Analysis (23A017CT) and Finite Element Analysis (23A0171T), which emphasize research-based problem solving and experimental validation.

Mr. B.V. Pruthvi Raj,

- Project-based learning and skill-oriented workshops by Civil Engineering Softwares (STAADPRO/CAD/TEKLA) (23A0172L) ensures hands-on skill development.
- Project-II (23A0182P) in the final semester emphasizes project-based learning.

1.Dr N R Gowthami	2.Dr D Gouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

The Curriculum updates aligned with **NEP-2020** and **industry requirements**, and Course structure and syllabus of IV B. Tech- I & II was approved by incorporating suggestions as enclosed in the Annexure-II

Agenda Item No. BoS/2026/CIVIL/19.4: Approval of Subject Experts panel

The panel was reviewed and approved unanimously by the Board as enclosed in the Annexure-III

Agenda Item No. BoS/2026/CIVIL/19.5: Curriculum feedback discussion

Feedback from stakeholders was analyzed.

Emphasized aligning curriculum with industry requirements.

The Board resolved to incorporate feedback in curriculum revisions such as **TEKLA** software.

Agenda Item No. BoS/2026/CIVIL/19.6: Any other item

No additional items were discussed.

On behalf of the Department of Civil Engineering, I sincerely thank our external experts, university nominee, industry representative, alumni member, and faculty colleagues for their valuable suggestions and active participation.

Your insights have greatly enriched our deliberations and will strengthen the curriculum to better equip our students with skills, knowledge, and attitudes aligned with sustainability and industry needs.With gratitude, we conclude this meeting on a constructive and forward-looking note.

Attendance Sheet:

S.No	Name of the Member	Role in Board of Studies	Signature
1	Dr. N. R. Gowthami Assistant Professor Dept. of Civil Engineering, AITS Rajampet	Chairman	
2	Dr. D. Gouse Peera Assistant Professor Dept. of Civil Engineering, AITS Rajampet	Internal Member	

1.Dr N R Gowthami	2.Dr D Gouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

3	Mr. V. Haneef Assistant Professor Dept. of Civil Engineering, AITS Rajampet	Internal Member	
4	Dr. M. Sree Murali Professor, Civil Engineering SV University, Tirupati	Outside Subject Expert	Attended online
5	Dr. Raghukanth Professor IIT Madras	Outside Subject Expert	Attended online
6	Prof. G. Appa Rao Professor in Civil Engineering IIT Madras, Chennai-600036, T.N.	University Nominee	Attended online
7	Sri. M. Krishna Reddy Retd. Chief Engineer, Panchayat Raj Dept., Andhra Pradesh Ph: 7702372660	Industry Expert	Attended online
8	Mr. B. V. Prudvi Raj Consultant – Planning Engineer Colliers International Property Services	Alumni	Attended online

CHAIRMAN-BOS
Department of CE
AITS, Rajampet.

1.Dr N R Gowthami	2.Dr D Gouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

ANNEXURE-1

B.Tech IV Year-I Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1	PC	23A0171T	Finite Element Analysis	3	0	0	3
2	ME	23AHSM7AT 23AHSM7BT 23AHSM7CT	Management Course-II 1. Business Ethics and Corporate Governance 2. E-Business 3. Management Science	2	0	0	2
3	PE-IV	23A017AT 23A017BT 23A017CT	1. Geo-synthetics and Reinforced Earth Structures 2. Railways, Airports, Docks and Harbour Engineering 3. Experimental Stress Analysis	3	0	0	3
4	PE-V	23A017DT 23A017ET 23A017FT	1. Ground Improvement Techniques 2. Subsurface Investigation and Instrumentation 3. Transportation Economics	3	0	0	3
5	OE-III	23A017KT	MOOCS (Interdisciplinary)	3	0	0	3
6	OE-IV		Interdisciplinary	3	0	0	3
7	**SOC**	23A0172L	Civil Engineering softwares (STAADPRO/CAD/TEKL)	0	1	2	2
8	Audit Course		Gender Sensitization	2	0	0	-
9		23A0173I	Evaluation of Industry Internship	-	-	-	2
			Total	**19**	**1**	**2**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer Vacation							

Open Elective-III ((MOOC's)

S.No.	Course Code	Title	Branch
1.	23A027IT	Smart Grid Technologies	EEE
2.	23A027JT	Electric Vehicles	EEE
3.	23A037KT	3D Printing Technologies	ME
4.	23A037LT	Total Quality Management	ME
5.	23A0474AT	Microprocessors and Microcontrollers	ECE
6.	23A0475AT	Transducers and Sensors	ECE
7.	23A057IT	Data Base Management Systems	CSE &
8.	23A057JT	Cyber Security	

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

9.	23A057KT	Computer Networks	Allied/IT
10.	23A057LT	Internet of Things	
11.	23AHS71T	Wavelet transforms and its applications	Mathematics
12.	23AHS75T	Financial Mathematics	Mathematics
13.	23AHS72T	Smart Materials and Devices	Physics
14.	23AHS73T	Green Chemistry and Catalysis for Sustainable Environment	Chemistry
15.	23AHS77T	Chemistry of Nanomaterials and Applications	Chemistry
16.	23AHS74T	Employability Skills	Humanities
17.	23AHS78T	Literary Vibes	Humanities

IV B.Tech-II Semester

S.No.	Category	Course Code	Title	L	T	P	Credits
1.	Project	23A0182P	Internship	-	-	-	4
			Project-II	-	-	-	8
Total							12

OPEN ELECTIVES OFFERED BY Civil Department to others

S.No.	Category	Course Code	Title	Offered during	L	T	P	C
1	OE-III	23A017GT	Building materials and services	IV B.Tech-I Sem	3	0	0	3
2	OE-III	23A017HT	Environmental Impact Assessment	IV B.Tech-I Sem	3	0	0	3
3	OE-IV	23A017IT	Geo-spatial technologies	IV B.Tech-I Sem	3	0	0	3
4	OE-IV	23A017JT	Solid waste management	IV B.Tech-I Sem	3	0	0	3

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
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DEPARTMENT OF CIVIL ENGINEERING

ANNEXURE-II

Title of the Course: FINITE ELEMENT ANALYSIS
Category: PC
Couse Code: 23A0171T
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:
After successful completion of this course, the student will be able to
1. Learn concepts, steps, merits, and energy principles.
2. Use equilibrium, strain-displacement, and constitutive relations.
3. Develop stiffness matrices and shape functions for 1D, 2D, triangular, and rectangular elements.
4. Apply CST, quadrilateral, Lagrangian, and Serendipity elements for analysis.
5. Implement numerical integration, condensation, and assembly for static loads.

Course Outcomes:
At the end of the course, the student will be able to
1. Explain the basic principles, advantages, and limitations of FEMin engineering applications.
2. Derive shape functions and stiffness matrices for 1D bar and beam elements.
3. Analyse continuous beams and plane stress/strain problems using FEM.
4. Develop iso parametric formulation for 2D elements such as CST and LST.
5. Implement solution techniques for assembling elements and solving

Unit 1 Introduction **11**

Concepts of FEM, steps, merits & demerits, Energy principles, discretization, Rayleigh–Ritz method of functional approximation.
Principles of elasticity: equilibrium equations, strain-displacement in matrix form.Constitutive relations for plane stress, plane strain, and axisymmetric bodies.

Unit 2 Types of Elements **11**

Stiffness matrix for bar element, Shape functions for 1D elements, 2D elements for plane stress/strain, Displacement models, generalized coordinates, Convergence, compatibility, geometric invariance, Natural coordinate system, area & volume coordinates.

Unit 3 Generation of Elements **8**

Stiffness and nodal load matrices, 3-node triangular element, 4-node rectangular element.

Unit 4 Isoparametric Formulation **10**

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Concepts of Isoparametric elements for 2D analysis, CST element, 4-node and 8-node quadrilateral elements, Lagrangian and Serendipity elements, Axisymmetric analysis with 4-node iso-parametric element

Unit 5 Solution Techniques **10**

Numerical Integration, Static Condensation, Assembly of Elements and Solution Techniques for Static Loads.

Prescribed Textbooks:

1. Introduction to finite Elements in Engineering by Tirupathi R. Chandrupatla, and Ashok D. Belegundu, Cambridge University Press, 5th edition, 2021.

Reference Books:

1. Introduction to finite elemenet method by J N Reddy, MC Graw Hill Publications, 4th Edition, 2023.

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/105/105/105105041/#
2. https://archive.nptel.ac.in/noc/courses/noc22/SEM1/noc22-me43/

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A0171T.1	3	2	2	2	2	-	-	-	-	-	-	2	3	3
23A0171T.2	3	3	3	3	3	-	-	-	-	-	-	2	3	3
23A0171T.3	3	3	3	3	3	-	-	-	-	-	-	2	3	3
23A0171T.4	3	3	3	3	3	-	-	-	-	-	-	2	3	3
23A0171T.5	2	2	2	2	3	-	-	-	-	1	-	2	2	2

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: GEO SYNTHETICS AND REINFORCED EARTH STRUCTURES
Category: PE
Couse Code: 23A017AT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:
1. Learn properties and uses of cement, lime, timber, metals, and modern materials.
2. Gain knowledge of foundations, masonry, flooring, roofing, and finishing works.
3. Use Indian Standards for safe and efficient construction practices.
4. Understand eco-friendly and green building materials.
5. Acquire hands-on knowledge for civil engineering projects.

Course Outcomes:
At the end of the course, the student will be able to
1. Explain the fundamentals of reinforced earth and analyze the effects of reinforcement on soil properties.
2. Compare different types of geosynthetics, their functions, and durability aspects in geotechnical applications.
3. Design reinforced earth retaining walls considering stability mechanisms and reinforcement layouts.
4. Evaluate reinforced embankments and foundation mattresses with respect to settlement and load-bearing capacity.
5. Design and analyse reinforced pavements and soil beds using standard methodologies.

Unit 1 Reinforced Earth: 8
Concept, Effects of Reinforcement on Soils – Equal Confining and Psuedo Cohesion Concepts, Materials, Friction Coefficient – Definition, Laboratory Determination, Factors Affecting Fiction Coefficient; Application of Reinforced Earth

Unit 2 Geosynthetics 9
Advantages Over Conventional Materials - Classification Based on Material, Types, Functions and Tests On Geosynthetics - Durability Aspects and Applications of Geosynthetics

Unit 3 Reinforced Earth Retaining Walls 8
Stability Mechanisms, Design of Reinforced Earth Retaining Wall, Selection of Materials, Geotechnical Analysis, Reinforcement Layout and Spacing, Stability Analysis, Advantages Over Conventional Retaining walls.

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 4 Reinforced Embankments 10

Introduction, Design of Reinforced Embankment, Foundation Mattress Below the Embankment, Purpose and Function of Foundation Mattresses, Components and Design of Reinforced Mattress, Design Calculations for Settlement Control, Bearing Capacity, and Long-Term Performance. Field Implementation and Monitoring Techniques

Unit 5 Reinforced Soil Beds 10

Introduction, Factors Affecting the Behaviour of Reinforced Soil Beds, Analysis and Design of Reinforced Pavements, Benefits of Placing Reinforcement, Flexible Pavement Layers-Design of Reinforced Pavements by Giroud and Noiray Approach and Modified CBR Method.

Prescribed Textbooks:

1. An Introduction to Soil Reinforcement and Geosynthetics! By G.L. Siva Kumar Babu, University Press India, 5th Edition, 2006.

Reference Books:

1. Designing with Geosynthetics by Robert M Koerner, R.M. Pearson Education Inc., 2012, 6th edition

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/105/106/105106052/
2. https://onlinecourses.nptel.ac.in/noc20_ce06/preview

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017AT	2	1	1	1	-	1	1	-	-	1	-	1	1	1
23A017AT	2	1	2	1	1	-	1	-	-	-	-	1	1	1
23A017AT	2	1	2	1	1	-	1	-	-	-	-	1	1	1
23A017AT	2	1	2	1	1	1	1	-	-	-	-	1	1	1
23A017AT	2	1	2	1	1	1	2	-	-	-	-	1	2	1

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING
Category: (PE – IV)
Couse Code: 23A017BT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:
1. Understand permanent way components, gauges, rails, sleepers, ballast, and rail fastenings.
2. Gain knowledge of gradients, curves, super elevation, points, crossings, and station yards.
3. Learn site selection, runway orientation, terminal layouts, and building concepts.
4. Understand aircraft characteristics, geometric design standards, and lighting systems.
5. Study harbour requirements, docks, breakwaters, dredging operations, and navigation aids.

Course Outcomes:
At the end of the course, the student will be able to
1. Explain railway track components, functions, and requirements.
2. Apply geometric design principles to railway track layout and interlocking systems.
3. Evaluate airport planning aspects, including site selection, runway design, and terminal planning.
4. Design runways and taxiways based on geometric standards and safety regulations.
5. Analyze ports and harbour structures, including docks, breakwaters, and navigation aids.

Unit 1 Railway Engineering 8
Introduction, Permanent Way Components, Cross Section of Permanent Way, Functions and Requirements of Rails, Sleepers and Ballast. Types of Gauges, Creep of Rails, Theories Related to Creep, Coning of Wheels, Adzing of Sleepers, Rail Fastenings.

Unit 2 Geometric Design of Railway Track 9
Gradients, Grade Compensation, Can't and Negative Super Elevation, Can't Deficiency, Degree of Curves, Safe Speed on Railway Track, Points and Crossings, Layout and Functioning of Left Hand Turn Out and Right Hand Turn Outs, Station Yards – Signalling and Interlocking, Introduction to tunnelling.

Unit 3 Airport Engineering 10
Airport- Site Selection, Factors Affecting Site Selection and Surveys, Runway Orientation, Wind Rose Diagram, Basic Runway Length, Correction for Runway Length, Terminal Area – Layout and Functions, Concepts of Terminal Building, Simple Building, Linear Concept, Pier Concept and Satellite Concept, Typical Layouts.

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 4 Geometric Design of Runways and Taxiways 10

Aircraft Characteristics – Influence of Characteristics on Airport Planning and Design, Geometric Design Elements of Runway, Standards and Specifications, Functions of Taxiways, Taxiway Geometric Design – Geometric Elements and Standard Specifications, Runway and Taxiway Lighting.

Unit 5 Ports and Harbors 10

Ports and Harbors – Types of Ports, Classification of Harbors. Docks-Types of Docks, Dry Docks, Wharves and Jetties – Breakwaters, Layouts of Different Types of Harbors and Docks, Dredging Operations – Navigation Aids

Prescribed Textbooks:

1. Highway, railway, Airport and Harbour Engineering – K.P. Subramanian, Scitech Publishers, 6th Edition 2022.

Reference Books:

1. Harbour, Dock and Tunnel Engineering – R. Srinivasan, Charotar Publishing House Pvt. Limited, 4th Edition, 2009.
2. Railway Track Engineering by J.S.Mundrey, McGraw Hill Education 5th edition 2017.

Online Learning Resources:

1.https://nptel.ac.in/courses/105107123
2.https://archive.nptel.ac.in/courses/114/106/114106025/
3.https://www.mkube.co.in/product-detail/railways-airports-docks-and-harbour- engineering

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and	Life-long learning	PSO1	PSO2
23A017BT.1	3	1	1	-	-	1	-	-	-	1	-	1	1	1
23A017BT.2	3	2	2	1	2	-	-	-	-	-	-	1	2	1
23A017BT.3	3	2	3	2	2	-	1	-	-	-	-	1	2	2
23A017BT.4	3	1	2	2	3	1	-	-	-	-	-	1	2	2
23A017BT.5	3	2	2	1	2	1	-	-	-	-	-	1	2	1

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: EXPERIMENTAL STRESS ANALYSIS
Category: PE
Couse Code: 23A017CT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Learn the merits, uses, and methods of experimental stress analysis.
2. Study strain gauge systems, types, properties, and corrections for temperature effects.
3. Use rosette methods, ultrasonic pulse velocity, and hammer tests for concrete assessment.
4. Understand stress optic laws, fringe patterns, and polar scope arrangements.
5. Learn isoclinic and isocratic fringe patterns, compensation techniques, and calibration methods.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain the principles and merits of experimental stress analysis.
2. Demonstrate strain measurement using various strain gauge techniques.
3. Analyze strain rosette data and evaluate concrete structures using NDT methods.
4. Apply the theory of photoelasticity to determine stress distributions in materials.
5. Utilize two-dimensional photoelasticity techniques for experimental stress analysis.

Unit 1 Introduction 8

Merits of Experimental Analysis Introduction, Uses of Experimental Stress Analysis, Advantages of Experimental Stress Analysis, Different Methods, Simplification of Problems

Unit 2 Strain Measurement 9

Definition of Strain and Its Relation of Experimental Determinations Properties of Strain Gauge Systems-Types of Strain Gauges, Mechanical, Acoustic and Optical Strain Gauges, Electrical Strain Gauges, Inductance Strain Gauges, LVDT, Resistance Strain Gauges, Various Types, Gauge Factor, Materials of Adhesion Base, Correction to Temperature effects.

Unit 3 Strain Rossettes 8

Introduction – Three Elements Rosette - Rosette Corrections for Transverse Strain Gauge, Mounting Methods of Strain Gauges, Ultrasonic Pulse Velocity Method – Application to Concrete. Hammer Test – Application to Concrete.

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 4 Photo Elasticity 10

Introduction, Temporary Double Refraction, The Stress Optic Law, Effects of Stressed Model in A Polar Scope for Various Arrangements, Fringe Sharpening. Brewster 's Stress Optic Law

Unit 5 Two-Dimensional Analysis 10

Introduction – Isocratic Fringe Patterns- Isoclinic Fringe Patterns Passage of Light Through Plane Polariscope and Circular Polariscope - Isoclinic Fringe Patterns – Compensation Techniques – Calibration Methods – Separation Methods – Scaling Model to Prototype Stresses – Materials for Photo – Elasticity Properties of Photo elastic Materials.

Prescribed Textbooks:

1. Experimental stress analysis by Dr. Sadhu Singh Khanna Publishers 4th edition, 2013

Reference Books:

1. Experimental Stress analysis by U.C. Jindal, Pearson Publications, 3rd Edition 2012.

Online Learning Resources:
1.https://archive.nptel.ac.in/courses/112/106/112106068/#
2.https://archive.nptel.ac.in/courses/112/106/112106198/#

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and	Life-long learning	PSO1	PSO2
23A017CT.1	3	2	-	-	-	2	-	-	-	1	-	1	1	1
23A017CT.2	3	2	2	2	2	3	-	-	-	-	-	1	2	2
23A017CT.3	2	2	3	2	2	3	2	-	-	-	-	1	2	2
23A017CT.4	3	2	2	2	2	3	2	-	-	-	-	1	2	2
23A017CT.5	2	2	2	2	2	3	2	-	-	-	-	1	2	2

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5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: GROUND IMPROVEMENT TECHNIQUES
Category: PE
Couse Code: 23A017DT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

The student will be able to:

1. Learn problems, identification tests, swell pressure determination, and foundation solutions like under-reamed piles.
2. Study methods of dewatering, drainage systems, grouting techniques, and post-grout testing.
3. Gain knowledge of in-situ densification techniques for granular and cohesive soils.
4. Understand mechanical, cement, lime, bituminous; and chemical stabilization methods.
5. Study principles, design of reinforced earth walls, and applications of geotextiles, geogrids, and geomembranes.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain the methods of dewatering and grouting and their importance in foundation engineering.
2. Analyze densification techniques for granular and cohesive soils to enhance soil strength.
3. Evaluate the effectiveness of soil stabilization methods for different ground conditions.
4. Apply reinforced earth principles and geosynthetics for soil retention and foundation stability.
5. Assess expansive soil problems, their identification methods, and suitable foundation techniques like under-reamed piles.

Unit 1 Expansive Soils 8

Problems of Expansive Soils, Tests for Identification, Methods of Determination of Swell Pressure. Improvement of Expansive Soils, Foundation Techniques in Expansive Soils, Under Reamed Piles.

Unit 2 Dewatering & Grouting 10

Methods of De-Watering Sumps and Interceptor Ditches Single, Multi Stage Well Points, Vacuum Well Points, Horizontal Wells, Foundation Drains, Blanket Drains, Criteria for Selection of Fill Material Around Drains, Electro-Osmosis.

Objectives of Grouting- Grouts and Their Properties, Grouting Methods- Ascending, Descending and Stage Grouting, Hydraulic Fracturing in Soils and Rocks, Post Grout Test

Unit 3 Densification Methods in Granular and Cohesive Soils 11

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

In – Situ Densification Methods in Granular Soils, Vibration at The Ground Surface, Impact At The Ground Surface, Vibration at Depth, Impact at Depth.
In – Situ Densification Methods in Cohesive Soils, Preloading or Dewatering, Vertical Drains, Sand Drains, Sand Wick Giordanis – Stone and Lime Columns, Thermal.

Unit 4 Stabilisation 10
Methods of Stabilization, Mechanical, Cement, Lime, Bituminous, Chemical Stabilization with Calcium Chloride, Sodium Silicate and Gypsum

Unit 5 Reinforced Earth 10
Principles, Components, Factors Governing Design of Reinforced Earth Walls, Design Principles of Reinforced Earth Walls.Geotextiles- Types, Functions and Applications, Geogrids and Geo Membranes – Functions and Applications

Prescribed Textbooks:
1. Ground Improvement Techniques, Dr.P. Purushotham Raj. Laxmi Publications, New Delhi University science press, New Delhi 3rd edition 2023.

Reference Books:
1. Ground Improvement Techniques, Nihar Ranajan Patra Vikas Publications, New Delhi, 2012.
2. An Introduction to Soil Reinforcement and Geosyntheticsl By G.L. Siva Kumar Babu, University Press India, 5th Edition, 2006.

Online Learning Resources:
1. https://archive.nptel.ac.in/courses/105/108/105108075/
2. https://archive.nptel.ac.in/courses/105/105/105105210/

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017DT	3	2	2	2	1	-	-	-	-	2	-	1	2	2
23A017DT	3	3	2	2	2	-	-	-	-	2	-	2	2	2
23A017DT	3	3	3	2	2	-	-	-	-	2	-	2	3	2
23A017DT	3	2	3	3	3	-	-	-	-	2	1	2	3	3
23A017DT	3	3	3	3	3	-	-	-	-	2	1	2	3	3

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course:	**SUB SURFACE INVESTIGATION AND INSTRUMENTATION**
Category:	**(PE – V)**
Couse Code:	23A017ET
Branch/es:	Civil Engineering
Semester:	**VII**

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1 Understand the processes of soil formation, weathering, transportation, deposition, stratification, and classification of soils.
2. Gain knowledge of various methods of soil exploration, boring, drilling, sampling techniques, and sample preparation for geotechnical investigations.
3. Develop the ability to interpret borehole logs, groundwater observations, and prepare soil profiles for subsurface exploration.
4. Learn and apply field testing methods and geophysical techniques for evaluating the engineering properties of soils and interpreting test results.
5. Acquire skills in preparing comprehensive soil investigation reports and understanding the use of field instrumentation for monitoring soil and foundation behaviour.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain soil formation processes, classification methods, and stratification phenomena.
2. Analyse soil exploration methods and sampling techniques for various geotechnical applications.
3. Evaluate borehole logging, groundwater observations, and their influence on soil properties.
4. Apply field testing procedures, including penetration tests and geophysical methods, to assess subsurface conditions.
5. Assess soil exploration report writing and field instrumentation techniques for site investigations.

Unit 1 Introduction 8

Soil formation, Types of Soils, Physical and Chemical Weathering, Soil Transport, Deposition and Stratification Phenomena and Soil Classification

Unit 2 Methods of Soil Exploration 9

Methods of Boring, Auguring and Drilling. Machinery Used for Drilling, Types of Augers and Their Usage for Various Projects. Soil Sampling: Sampling Methods, Types of Samples, Storage of Samples and Their Transport. Sample Preparation. Sample Sizes. Types of Sampler's Specifications

Unit 3 Borehole Logging 8

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Logging of Boreholes, Logging Methods, Groundwater Observations, Water Table Fluctuations and Effects - Preparation of Soil Profiles and Exploration

Unit 4 Field Testing of Soils 10

Methods and Specifications, Visual Identification Tests, Standard Penetration Test (SPT), Plate Load Test (PLT), Pressure Meter Test (PMT) Dilatometer Test (DMT) Vane Shear Test (VST), Cone Penetration Test (CPT), Becker Penetration Test (BPT), Analysis of Test Results. Geophysical Methods of Soil Exploration- Seismic Refraction, Electrical Resistivity, Cross Hole Test.

Unit 5 Preparation of Soil Investigation Report. 10

Soil Exploration Reports, Identification, Calculations and Preparation.

Field Instrumentation-Strain Gauges, Piezometer, Pressure Cells, Inclinometers, Proving Ring, Load Cells, Displacement Gauges

Prescribed Textbooks:

1. Basic and Applied Soil Mechanics- A.S. Rao and Gopal Ranjan, New Age International, 5th Edition, 2024

Reference Books:

1. Geotechnical Instrumentation for Monitoring Field Performance, John Dunn cliff, Wiley Inter science, 2008
2. IS:1892-Code of Practice for subsurface investigation for foundation, 1979

Online Learning Resources:

1.https://archive.nptel.ac.in/courses/105/103/105103182/

2.https://onlinecourses.nptel.ac.in/noc25_ce27/preview

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017ET.1	3	2	1	2	1	2	2	1	-	2	-	2	2	2
23A017ET.2	3	3	2	3	2	2	3	1	-	2	-	2	2	2
23A017ET.3	3	3	3	3	3	2	3	2	-	2	-	2	3	3
23A017ET.4	3	2	3	3	3	3	3	2	-	2	2	2	3	3
23A017ET.5	3	3	3	3	3	3	3	2	-	2	2	2	3	3

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: TRANSPORTATION ECONOMICS
Category: PE
Couse Code: 23A017FT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:
1. Understand concepts of project development, budgeting, financial planning, and professional ethics.
2. Gain knowledge of agency costs, user costs, demand-supply dynamics, and elasticity of travel.
3. Evaluate fuel, maintenance, depreciation, crew costs, accident costs, and congestion economics.
4. Use cost-benefit ratio, NPV, IRR, and other methods to assess transport project viability.
5. Understand road project financing

Course Outcomes:
At the end of the course, the student will be able to
1. Describe the overall process of transportation project development and financial planning.
2. Analyze transportation cost structures, including demand and supply elasticity.
3. Evaluate vehicle operating costs and traffic congestion pricing strategies.
4. Apply economic analysis techniques to assess the feasibility of transportation projects.
5. Assess financial models, PPP strategies, and risk analysis for road projects

Unit 1 Preliminaries of Transportation 8
Concepts, Overall Transportation Project Development, Budgeting, Financial Planning, The Process of Transportation Project Development, Models Associated with Transportation Impact Evaluation Professional Ethics.

Unit 2 Transportation Finance 9
Classification of Transportation Costs, Transportation Agency Costs, Transportation User Costs, General Structure and Behaviour of Cost Functions and Road Pricing. Estimating Transportation Demand and Supply - Supply Equilibration, Dynamics of Transportation Demand and Supply, Elasticity of Travel Demand and Supply, Classification of Elasticity

Unit 3 Vehicle Operating Costs 7
Fuel Costs, Maintenance and Spares, Depreciation, Crew Costs, Value of Travel Time Savings, Accident Costs. Economics of Traffic Congestion, Pricing Policy

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 4 Economic Analysis of Projects 10

Methods of Evaluation - Cost-Benefit Ratio, First Year Rate of Return, Net Present Value, and Internal-Rate of Return Methods; Indirect Costs and Benefits of Transport Projects

Unit 5 Financing of Road Projects 10

Methods, Private Public Partnership (PPP), toll Collection, Economic Viability of Design, Build-Operate - Transfer Schemes, Risk Analysis, Value for Money Analysis, Case Studies.

Prescribed Textbooks:

1. Economics in Highway and Transportation Planning by Sarkar, P. K., and Maitri V, Standard Publisher, New Delhi, 4th Edition, 2010.

Reference Books:

1. IRC, Manual on Economic Evaluation of Highway Projects in India, SP30, 2007
2. Principles of Transport Economics by Quinet, E., and Vickerman, R., Edward Elgar Pub, 2005

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/105/104/105104098/
2. https://archive.nptel.ac.in/content/storage2/courses/105101087/01-Ltexhtml/p2/p.html

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017FT.1	3	2	2	1	2	-	-	-	-	2	-	2	2	2
23A017FT.2	3	3	3	3	3	-	-	-	-	2	-	2	3	2
23A017FT.3	3	3	3	3	2	-	-	-	-	2	-	2	3	3
23A017FT.4	3	3	3	3	2	-	-	-	-	2	-	2	3	3
23A017FT.5	3	3	3	3	3	3	3	3	-	2	-	2	3	3

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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: BUILDING MATERIALS AND SERVICES
Category: OE
Couse Code: 23A017GT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:
1. Learn properties, classifications, and uses of stones, bricks, timber, metals, glass, and plastics.
2. Gain knowledge of cement types, composition, hydration, and field/lab tests with admixtures.
3. Understand lintels, arches, walls, roofs, foundations, staircases, and joinery elements.
4. Study brick, stone, composite masonry, plastering, painting, cladding, scaffolding, and formwork.
5. Learn plumbing, ventilation, air-conditioning, acoustics, orientation, and fire protection systems.

Course Outcomes:
At the end of the course, the student will be able to
1. Understand the properties, classifications, and applications of building materials like stones, bricks, tiles, wood, aluminum, glass, paints, and plastics.
2. Analyze the composition, manufacturing process, and properties of cement and admixtures.
3. Apply knowledge of building components such as lintels, arches, walls, stairs, floors, roofs, foundations, and joinery.
4. Evaluate masonry, mortars, finishing techniques, and formwork systems.
5. Assess various building services including plumbing, ventilation, air conditioning, acoustics, and fire protection.

Unit 1 Building Materials 8

Building Stones – Classifications and Quarrying, Properties, Structural Requirements, Dressing. Bricks – Composition of Brick Earth, Manufacture and Structural Requirements, Fly Ash, Ceramics. Timber, Aluminium, Glass, Paints and Plastics, Wood – Structure, Types and Properties, Seasoning, Defects. Alternate Materials for Timber – GI / Fibre, Reinforced Glass Bricks, Steel & Aluminium, Plastics.

Unit 2 Cementitious materials 8

Types of Cement - Ingredients of Cement, Manufacture, Chemical Composition, Hydration, Field & Lab Tests – Fineness, Consistency, Initial &Final Setting, Soundness. Admixtures – Mineral & Chemical Admixtures, Uses

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 3 Building Components 8

Lintels, Arches, Walls, Vaults, Stair Cases, Types of Floors, Types of Roofs – Flat, Curved, Trussed. Foundations – Types, Damp Proof Course, Joinery, Doors, Windows- Materials, Types.

Unit 4 Masonry and Finishing 10

Lime and Cement Mortars Brick Masonry – Types, Bonds. Stone Masonry – Types, Composite Masonry, Brick-Stone Composite, Concrete, Reinforced Brick. Finishers, Plastering, Pointing, Painting, Claddings, Types, Tiles, ACP form Work Types- Requirements, Standards, Scaffolding, Design, Shoring, Underpinning.

Unit 5 Building Services 10

Plumbing Services- Water Distribution, Sanitary – Lines & Fittings, Ventilations-Functional Requirements, Systems of Ventilations. Air-Conditioning, Building Orientation - Essentials and Types; Acoustics – Characteristic, Absorption, Acoustic Design, Fire Protection, Fire Hazards. Classification of Fire-Resistant Materials and Constructions.

Prescribed Textbooks:

1. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications, 5th Edition, 2020.

Reference Books:

1. Building Materials by S. K. Duggal, Oxford & IBH Publishing Co. Ltd., New Delhi, 2019

Online Learning Resources:

1.**https://archive.nptel.ac.in/courses/105/102/105102088/**

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017GT.1	3	-	-	-	2	-	-	-	-	-	-	-	3	3
23A017GT.2	3	3	-	-	2	-	-	-	-	-	-	2	3	3
23A017GT.3	3	-	3	2	3	-	-	-	-	-	-	-	3	3
23A017GT.4	-	-	3	3	3	-	2	-	-	-	-	-	3	3
23A017GT.5	-	-	-	-	-	3	3	2	-	-	-	-	-	3

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
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DEPARTMENT OF CIVIL ENGINEERING

Title of the Course: ENVIRONMENTAL IMPACT ASSESSMENT
Category: (OE – III)
Couse Code: 23A017HT
Branch/es: Civil Engineering
Semester: VII

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Learn EIA basics – Understand concepts and methods of Environmental Impact Assessment.
2. Study development impacts – Assess effects of projects on soil, water, air, and land use.
3. Evaluate ecology and risk – Examine impacts on vegetation, wildlife, and perform risk assessment.
4. Apply audit practices – Gain skills in environmental audit procedures and reporting.
5. Know environmental laws – Understand acts, notifications, and ISO standards in EIA.

Course Outcomes:

At the end of the course, the student will be able to

1. Apply various methodologies for conducting Environmental Impact Assessments.
2. Analyze the impact of land-use changes on soil, water, and air quality.
3. Evaluate the environmental impact on vegetation, wildlife, and conduct risk assessments.
4. Develop environmental audit reports and assess compliance with environmental policies.
5. Interpret and apply environmental acts and regulations related to EIA.

Unit 1 Concepts and methodologies of EIA 9

Basics of EIA, initial examination, factors affecting evaluation, base map preparation, parameter classification, and key EIA methods like matrix, network, overlay, and cost/benefit analysis.

Unit 2 Impact of Developmental Activities and Land Use 9

Assessment of soil, groundwater, surface water, air, and biological environment. Study area delineation, activity identification, data collection, impact prediction, and mitigation measures.

Unit 3 Assessment of Impact on Vegetation, Wildlife and Risk Assessment 8

Impacts of development on vegetation and wildlife, deforestation causes and effects, and basics of environmental risk assessment with its stages and advantages.

Unit 4 Environmental Audit 10

Introduction to audits, objectives, types, protocols, stages, onsite activities, data evaluation, and preparation of audit reports.

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 5 Environmental Acts and Notifications 9

Overview of Environmental Protection, Water, Air, and Wildlife Acts, EIA notification provisions, clearance procedures, report evaluation, post-audit activities, and ISO/ISO 14000 standards.

Prescribed Textbooks:

1. Environmental Impact Assessment Methodologies, by Y. Anjaneyulu, B. S. Publication, Hyderabad 2nd edition 2011.

Reference Books:

1. Environmental Engineering, by Peavy, H. S, Rowe, D. R, Tchobanoglous, G.Mc-Graw Hill International Editions, New York 1985.

Online Learning Resources:

1.https://archive.nptel.ac.in/courses/124/107/124107160/

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017HT.1	3	2	2	2	2	3	-	-	-	-	-	1	2	2
23A017HT.2	3	3	3	2	2	3	-	-	-	-	-	1	3	2
23A017HT.3	3	3	3	2	2	3	3	-	-	-	-	1	3	3
23A017HT.4	3	3	3	3	2	3	3	-	-	-	-	1	3	3
23A017HT.5	2	2	2	2	2	3	3	3	-	-	-	1	2	2

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Title of the Course:	**GEO-SPATIAL TECHNOLOGIES**
Category:	**OE**
Couse Code:	23A017IT
Branch/es:	Civil Engineering
Semester:	**VII**

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Learn map algebra, reclassification, overlay operations, neighborhood and zonal analysis, and cost-distance methods.
2. Understand attribute queries, coordinate transformations, overlay techniques, and proximity analysis with buffering.
3. Build network databases, perform shortest path, driving directions, service area, and location-allocation studies.
4. Work with DEMs, terrain analysis, watershed modeling, and spatial interpolation methods like IDW, spline, and kriging.
5. Learn scripting with Python, Web GIS architecture, mobile mapping, and big data applications.

Course Outcomes:

At the end of the course, the student will be able to

1. Apply **raster analysis** techniques like query, overlay, and cost-distance.
2. Use **vector analysis** methods including topology, overlay, and proximity.
3. Implement **network analysis** for geocoding, shortest path, and location-allocation.
4. Evaluate **surface and geostatistics** such as terrain modeling, watershed, and interpolation.
5. Assess **GIS customization**, Web GIS, and mobile mapping for practical applications.

Unit 1 Raster Analysis 8

Raster data exploration, query analysis, map algebra, reclassification, overlay and extended neighborhood operation, zonal operations, statistical analysis, cost-distance analysis, least-cost path.

Unit 2 Vector Analysis 8

Attribute database query, SQL, coordinate transformation, summary statistics, area, perimeter, distance, reclassification, aggregation, overlay analysis (point-in-polygon, line-in-polygon, polygon-on-polygon), clip, erase, identity, union, intersection, buffering.

Unit 3 Network Analysis 8

Network data model, elements of network, network database, geocoding, address matching, shortest path, time-based and distance-based analysis, driving directions, closest facility, service area, location-allocation.

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 4 Surface and Geostatistical Analysis 10

Surface data sources, DEM, TIN, terrain analysis (slope, aspect, viewshed), watershed analysis (boundary, flow direction, accumulation, drainage network), spatial interpolation (IDW, spline, kriging, variogram).

Unit 5 Customisation, Web GIS, Mobile Mapping 10

GIS customization, scripting languages, Python, Web GIS architecture, advantages, web applications, location-based services, emergency solutions, business solutions, big data analytics.

Prescribed Textbooks:

1. Introduction to Geospatial Technologies by Bradley A. Shellito, Macmillan Learning 4th Edition., 2018.

Reference Books:

1. An Introduction to Geographical Information Systems by Ian Heywood, Sarah Cornelius, Steve Carver, Srinivasa raju, Pearson Education, 2nd Edition, 2007.

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/105/105/105105202/
2. **https://onlinecourses.nptel.ac.in/noc19_cs76/preview**

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017IT.1	3	-	-	-	2	-	-	-	-	-	-	-	3	3
23A017IT.2	3	3	-	-	2	-	-	-	-	-	-	2	3	3
23A017IT.3	3	-	3	2	3	-	-	-	-	-	-	-	3	3
23A017IT.4	-	-	3	3	3	-	2	-	-	-	-	-	3	3
23A017IT.5	-	-	-	-	3	3	3	2	-	-	-	-	3	3

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Title of the Course:	**SOLID WASTE MANAGEMENT**
Category:	**OE**
Couse Code:	23A017JT
Branch/es:	Civil Engineering
Semester:	**VII**

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Learn definitions, types, sources, properties, and rules of solid waste management.
2. Gain knowledge of generation, storage, collection, transfer, and processing techniques.
3. Explore composting, pyrolysis, gasification, RDF, and energy recovery systems.
4. Understand types, construction, liners, leachate control, monitoring, and reclamation of landfills.
5. Study sources, effects, disposal methods, incineration, biomedical waste, e-waste, and nuclear waste management.

Course Outcomes:

At the end of the course, the student will be able to

1. Understand the types, sources, and characteristics of solid waste, along with regulatory frameworks.
2. Analyze engineering systems for solid waste collection, storage, and transportation.
3. Apply resource and energy recovery techniques for sustainable solid waste management.
4. Evaluate landfill design, construction, and environmental impact mitigation strategies.
5. Assess hazardous waste management techniques, including biomedical and e-waste

Unit 1 Solid Waste 8

Definitions, types of solid wastes, sources, characteristics, perspectives, properties, sampling, elements of solid waste management, integrated solid waste management, Solid Waste Management Rules 2016.

Unit 2 Solid Waste Management: 8

olid waste generation, on-site handling, storage, processing, collection, stationary container system, hauled container system, route planning, transfer and transport, processing techniques.

Unit 3 Resource and Energy Recovery 8

Processing techniques, materials recovery systems, biological conversion products, composting (pre and post processing, types, parameters, problems), thermal conversion products, pyrolysis, gasification, RDF, recovery of energy, materials and energy recovery systems..

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Unit 4 Landfills 10

Evolution of landfills, types and construction, design considerations, life of landfills, landfill problems, lining, types of liners, leachate pollution and control, monitoring, reclamation.

Unit 5 Hazardous Waste Management 10

Sources and characteristics, environmental effects, risk assessment, disposal methods, secured landfills, incineration, monitoring, biomedical waste disposal, e-waste management, nuclear wastes, industrial waste management.

Prescribed Textbooks:

1. Solid and Hazardous Waste Managementby **S.C. Bhatia ,*Atlantic Publishers,* 2nd edition** 2021

Reference Books:

1. Environmental Engineering by Peavy, H.S, Rowe, D.R., and G., McGraw Hill Inc., New York, 1985.

Online Learning Resources:

1. **https://archive.nptel.ac.in/courses/105/103/105103205/**
2. **https://archive.nptel.ac.in/courses/120/108/120108005/**

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A017JT.1	3	-	-	-	2	-	2	-	-	-	-	-	3	3
23A017JT.2	3	3	-	-	2	-	3	-	-	-	-	2	3	3
23A017JT.3	3	-	3	2	3	-	3	-	-	-	-	-	3	3
23A017JT.4	-	-	3	3	3	-	3	2	-	-	-	-	3	3
23A017JT.5	-	-	-	-	3	3	3	3	-	-	-	-	3	3

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

Title of the Course:	**Civil Engineering Software (STAADPRO/CAD/TEKLA)**
Category:	SC
Couse Code:	23A0172L
Branch/es:	Civil Engineering
Semester:	**VII**

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	-	-	3

Course Objectives:

1. Provide fundamental knowledge of Auto CAD and Tekla for 2D drafting and 3D modeling.
2. Train students in structural analysis and design using STAAD.Pro
3. Develop skills in reinforcement detailing and structural component modeling.
4. Introduce seismic and nonlinear analysis for structural safety evaluation.
5. Enable students to apply civil engineering software tools for real-world projects.

Course Outcomes:

At the end of the course, the student will be able to

1. Apply basic drafting in AutoCAD to prepare 2D drawings and residential floor plans.
2. Develop reinforcement detailing drawings for beams, columns, slabs, and footings using AutoCAD in accordance with standard engineering practices.
3. Create steel structural components such as columns, roof trusses, composite beams, and base plate connections using Tekla Structures.
4. Construct structural models and perform analysis and design of structural elements and RCC buildings using STAAD Pro.
5. Evaluate the behavior and safety of structures under various loading conditions, including gravity and seismic loads, and interpret the analysis results for engineering decision-making.

List of Experiments: -

1. Determination of Basic Drawing and Editing Commands in AutoCAD
2. Creation of a 2D Floor Plan for a Residential Building in AutoCAD
3. Development of Structural Detailing for Beams and Columns in AutoCAD
4. Development of Reinforcement Detailing for Slabs and Footings in AutoCAD
5. Creation and analysis of a steel column using TEKLA

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

6. Modelling a Roof Truss by TEKLA
7. Design of a Composite Beam by TEKLA
8. Column Base Plate Design by TEKLA
9. Determination of STAAD Pro Interface and Structural Model Setup
10. Analysis and Design of a Simply Supported Beam in STAAD Pro
11. Development of Structural Analysis for a Multi-Story RCC Building in STAAD Pro
12. Application of Seismic Load Analysis on a Building Structure in STAAD Pro

Note-10 out of 12 experiments should be conducted mandatorily.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A0172L.1	3	1	1	-	2	-	-	1	-	1	1	1	2	1
23A0172L.2	3	1	2	-	3	-	-	2	-	2	2	2	1	1
23A0172L.3	3	1	2	-	3	-	-	2	-	2	2	2	2	2
23A0172L.4	3	1	1	-	3	-	-	1	-	1	1	1	1	2
23A0172L.5	3	1	1	-	3	-	-	1	-	1	1	1	1	1

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

ANNEXURE-III

List of Examiners for IV B.Tech - I Sem Courses-Subject Experts

S.No	Subject Title & Code	Subject Expert Name	Designation	Address	Phone No	E-Mail Address
1	23A0171T-Finite Element Analysis	Dr. B. Raghunath Reddy	Associate Professor	Sai Rajeswari Institute Of Technology, Lingapuram, Proddatur	8008110085	Rnreddy.Srit@Gmail.Com
2		Mr. Y. Ravi Reddy	Associate Professor	Bapatla Engineering College, GBC Road, Mahatmajipuram, Bapatla, Andhra Pradesh	9849165681	Ravireddy29@Gmail.Com
3		Dr. V. Giridhar	Professor	K.S.R.M. College Of Engineering, Kadapa	9849499769	Drgiridhar@Ksrmce.Ac.In
4		Dr. V Sai Neeraja	Associate Professor	CBIT(A), Proddatur	9640776309	Saineeraja6@Gmail.Com
5		Dr. G.N Sree Kanth	Assistant Professor	RGM, Nandyal	9492569130	Sreekanthcivil@Rgmcet.Edu.In
1	23A017AT- Geo-Synthetics And Reinforced Earth Structures	S. Jasmine	Assistant Professor	Annamacharya Institute of Technology and Sciences, kadapa	9398191441	saatika21@gmail.com
2		Dr. B Kavyatheja	Associate Professor	JNTUA College Of Engineering, Kalikiri	8919579180	**Kavyateja2014@Gmail.Com**
3		Dr. A. Anil	Associate Professor	Annamacharya Institute Of Technology, Tirupathi	90000434205	Anilachyutha@Gmail.Com
4		DR. M. Padmaja	Associate Professor	MGIT, Hyderabad	9962433838	Padmajamegham@Gmail.Com
5		Mr. Koppala Siva	Assistant Professor	Department Of Civil Engineering, Siddarth Institute Of Engi	9441470542	Koppalasiva4444@Gmail.Com

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

S.No	Subject Title & Code	Subject Expert Name	Designation	Address	Phone No	E-Mail Address
1	23A017BT-Railways, Airports, Docks And Harbour Engineering	K. Naresh	Assistant Professor	PBR Visvodaya Institute Of Technology And Science, Kavali, Nellore	9494811370	Naresh.K@Visvodayata.Ac.In
2		P. Pavan Kumar	Assistant Professor	Department Of Civil Engineering, K.S.R.M. College Of Engineering, Kadapa	8500071486, 9390316822	Pavanpalagiri@Ksrmce.Ac.In
3		Dr. M V Ravi Kishore Reddy	Associate Professor	KSRMCE , KADAPA	9032158604	Ravikishorereddymv@Yahoo.In
		Dr R Susmitha	Assistant Professor	GPREC, Kurnool	9848515925	Susmithareamireddy@Gmail.Com
4		Mr. Syed Sibgathullah	Assistant Professor	Srinivasa Institute Of Technology and Science, Kadapa	9391387460, 9603918429	Sibgatullasyed@Gmail.Com
1	23a017ct - Experimental Stress Analysis	Dr. K Venkateswarlu	Associate Professor	RGM, Nandyal	9705543261	Venkateswar154@Gmail.Com
		Dr K Naveena	Assistant Professor	SRIT, PRODDATUR	6305470568	Naveenabtech2012@Gmail.Com
2		G. Madhava Krishna Reddy	Assistant Professor	GMR Institute Of Technology (Deemed To Be University), Rajam – 532127, Vizianagaram District	8500016419	Civilmadhava@Gmail.Com
3		Prof. Prakash Jadhav	Professor	Department Of Mechanical Engineering, Srm University, Mangalagiri Mandal, Guntur District – 522240, Andhra Pradesh	9663387438	Prakash.J@Srmap.Edu.In
5		Mr.K. Balanagaiah	Assistant Professor	SRIT, PRODDATUR	8897112656	Kogatambalu007@Gmail.Com
1	23a017dt-Ground Improvement	Mr. Perumalla Harsha Vardhan	Assistant Professor	Mjr College, Piler	8500897957	Harshaperumalla33@Gmail.Com
2		Dr. V. Ramesh Babu	Associate Professor	Geethanjali Institute Of Science And Technology, Nellore	9441195639	Vramesh@Gist.Edu.In

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

S.No	Subject Title & Code	Subject Expert Name	Designation	Address	Phone No	E-Mail Address
3	Techniques	Mr. P. Harshavardhan Reddy	Assistant Professor	Vemu Institute Of Technology	7993506520	Sivaharsha115@Gmail.Com
4		Mr. P. Dasthagiri	Assistant Professor	K.S.R.M.C.E., Kadapa	8978044591	Poddaturdastagiri1@Gmail.Com
5		Dr. S. Sruthi	Associate Professor	CBIT(A), Proddatur	93618 25436	Sruthiscivil@Gmail.Com
1	23A017ET-Subsurface Investigation and Instrumentation	Mr. K. Jaya Sundar	Assistant Professor	Bapatla Engineering College, Gbc Road, Mahatmajipuram, Bapatla, Andhra Pradesh	8497955620	Jayasundar.Kommera@Becbapatla.Ac.In
2		Dr M C Venkatasubbaiah	Associate Professor & Hod	St.Peter's Engineering College (Autonomous), Maisammaguda	9985855672	Venkat.Cct.Fus@Gmail.Com
3		Mrs. Nagamala Tharuni	Assistant Professor	Srinivasa Institute Of Technology And Science, Kadapa	9398972011	Nagamalatharuni@Gmail.Com
4		Dr. R. Santhi Kala	Associate Professor	Kkr & Ksr Institute Of Technology And Sciences, Vijnanampadu	9490243527	Santhikala3406@Gmail.Com
5		Abhishek A. P	Assistant Professor	Shridevi Institute Of Engineering And Technology, Sira Road, Tumkur – 572106, Karnataka	7899884470	Agraharaabhi@Gmail.Com
1	23A017FT-Transportation Economics	Mr. P. Praveen Kumar	Assistant Professor	Guru Nanak Institute Of Technology, R.R. District, Hyderabad	8500867768	Ppraveenkumar.Cegnit@Gniindia.Org
2		Jamkari Arunkumar	Assistant Professor	Narsimha Reddy Engineering College	8185875596	Arun08jamkari@Gmail.Com
3		Miss Are Vigneshwari	Assistant Professor	Siddharth Institute Of Engineering & Technology, Puttur, Tirupati,	8985304743	A.Vignupadma@Gmail.Com
4		Anjan Kumar M. U	Assistant Professor	Bearys Institute Of Technology, Bearys Knowledge Campus, Lands End, Innoli, Near Mangaluru University, Mangaluru – 574199, Karnataka, India	9591609877	Anjankumarmu@Gmail.Com
		Dr. Parvathidevi A.	Associate Professor	Marri Laxman Reddy Institute Of	7386943996	Deviproject1@Gmail.Com

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

S.No	Subject Title & Code	Subject Expert Name	Designation	Address	Phone No	E-Mail Address
5				Technology And Management, Hyderabad		
1	23A017GT-Building materials and services	Dr. V.Guru Prathap Reddy	Assistant Professor	Nit Nagaland	9966320098	Vguruprathap@Gmail.Com
2		G Madhava Krishna Reddy	Assistant Professor	Gmr Institute Of Technology Deemed To Be University	8500016419	Civilmadhava@Gmail.Com
3		Dr P.Kishore Kumar Reddy	Associate Professor	Malla Reddy Engineering College (Autonomous) Secundrabad 500100, Telangana,	9705558182	Pkkrnitc@Gmail.Com
4		Dr T Santhala	Professor,	Rgm Engineering College, Nandyal	6304462841	Shanthalas30@Gmail.Com
5		Dr K Shaiksha Valli	Assistant Professor	Sanjeevani University, Kopargao, Maharastra	9959656469	Shakku912gmail.Com
1	23A017HT-Environmental Impact Assessment	Dr. M. Padmaja	Associate Professor	Mgit, Hyderabad	9962433838	Padmajamegham@Gmail.Com
2		Dr. Sudheekar Reddy	Assistant Professor	Department Of Civil Engineering,Scve Tirupathi	82979 60423	Sudheekar8055@Gmail.Com
3		Dr. N Pallavi	Associate Professor	`Depertment Of Environmental Sciences, Jss Acedemy Of Higher Education & Research, Mysore	9980889207	Anupallavi@Jssuni.Edu.In
4		Dr. R Bhavani	Professor	Jntua	9490981954	Rbhavani.Civil@Jntau.Ac.In
5		Dr. P. Lakshmi Sruthi	Assistant Professor	Department Of Civil Engineering, G Pulla Reddyenginering College	8885174575	Plakshmisruthi@Gmail.Com
1	23A017IT- Geo-spatial technologies	Dr. S. Vinay Babu	Professor	G. Pullaiah College Of Engineering & Technology, Kurnool	9494483052	Vinaysake@Gmail.Com
2		Miss V. Lalitha	Assistant Professor	Sree Rama Engineering College, Tirupati	7780301363	V.Lalitha@Sreerama.Ac.In
3		Dr. Daggupati Sridhar	Assistant Professor	Siddharth Institute Of Engineering & Technology, Puttur, Tirupati, India	6305311157	Sridhar.Daggu124@Gmail.Com

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF CIVIL ENGINEERING

S.No	Subject Title & Code	Subject Expert Name	Designation	Address	Phone No	E-Mail Address
4		V. Lokesh	Assistant Professor	Structural Engineering, Sree Rama Engineering College	9700608376	lokeshvepareddy@gmail.com
5		S. Monica Sowjanya	Assistant Professor	Environmental Engineering, Sree Rama Engineering College	8142227138	mounica.san18@gmail.com

1	23A017JT-Solid waste management	Dr. T. Santhala	Professor	RGM Engineering College, Nandyal	6304462841	shanthalas30@gmail.com
2		Mr. Koppala Siva	Assistant Professor	Siddharth Institute of Engineering, Puttur, Tirupati	9441470542	koppalasiva4444@gmail.com
3		Dr. E Sanjeeva Rayudu	Professor	G. Pulla Reddy Engineering College (GPREC), Kurnool	9440920105	Sanjeeva.ce@gprec.ac.in
4		Kalakada Satish	Assistant Professor	Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor	7842294314	kalakadasatishgeotech@gmail.com
5		Dr. Panga Narasimha Reddy	Associate Professor	Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor	7382747210	narasimhareddyp@svcet.in

1.Dr N R Gowthami	2.Dr D Ghouse Peera	3.Mr. V. Haneef	4.Dr M Sree Murali Attended Online
5.Dr STG Raghukanth Attended Online	6.Dr G Appa Rao Attended Online	7.Sri M Krishna Reddy Attended Online	8.Mr B Prudvi Raj Attended Online

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

MINUTES of 19th BOS MEETING

Date & Time
08/06/2025 & 10.30 am

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Academic Year 2026-2027

MINUTES OF BOARD OF STUDIES

The meeting of the Board of Studies in Electrical and Electronics Engineering (UG) of the Department of Electrical and Electronics Engineering, AITS, Rajampet held on 21/06/2025 at 10.30 a.m. to discuss the revision of curriculum and syllabus of B. Tech.

The following members were present for the BoS meeting

S. No.	Name of the Board Member	Designation	Institute/Industry	Role
Internal Members				
1.	Dr. P. B. Chennaiah	Associate Professor	AITS, Rajampet.	Chairman
2.	Dr. M. Padma Lalitha	Professor	AITS, Rajampet.	Member
3.	Dr. C. Ganesh	Assistant Professor	AITS, Rajampet.	Member
External Members				
4.	Dr. Subhransu Sekhar Dash	Principal	Government College of Engineering, Kalahandi Bhubaneswar, Odisha	Subject Expert
5.	Dr. N. Chellammal,	Professor	SRM Institute of Science & Technology, Chennai.	Subject Expert
6.	Dr. R. Sreenivasa Rao	Professor	JNTU, Kakinada.	University Nominee
7.	Dr. K. Sreenivas	Chief Engineer	APTRANSCO, Vijayawada.	Industry Expert
8.	Dr. C. Santhi Durganjali	System HIL Validation Engineer	TATA, Elxsi, Hyderabad.	Alumni

P. B ——→ (P. B Chennaiah)

(Dr M Padma Lalitha)

(C. Ganesh)

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AGENDA OF THE MEETING

Item No.	Particulars
BoS/2026/EEE/UG/19.1	Ratification of 18th Board of Studies meeting.
BoS/2026/EEE/UG/19.2	Ratification of 18th Board of Studies meeting action taken.
BoS/2026/EEE/UG/19.3	Discussion on stakeholder's feedback on curriculum.
BoS/2026/EEE/UG/19.4	Discussion on Selection of MOOC Course for IV B. Tech, I-Semester, R23 Regulation
BoS/2026/EEE/UG/19.5	Identification and Listing of External Examiners.

P.B.V P
C P.B. chennaiah

(Smt. Padma Lahitha)

C. Ganesh

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MINUTES OF THE MEETING

Dr. P. B. Chennaiah, Associate Professor and Head Department of Electrical & Electronics Engineering, Chairman, BoS initiated the meeting with a warm welcome and thanked them for accepting the invitation to the 19th BoS meeting.

Item No: BoS / 2026 / EEE / UG / 19.1

Ratification of 18th Board of Studies meeting held on 21/06/2025

The external BoS members have ratified the points discussed in the 18th Board of Studies meeting held on 21/06/2025.

Item No: BoS / 2026 / EEE / UG / 19.2

Ratification of 18th BoS meeting action taken report

The BoS chairman presented the action taken report on changes made in the syllabus as per the suggestions given by the external BoS members and is enclosed in **Annexure-I.** The BoS members approved the same.

Item No: BoS / 2026 / EEE / UG / 19.3

Discussion on stakeholder's feedback on curriculum.

The BoS chairman presented the stakeholders feedback on curriculum received from the feedback committee approved by PAC (Programme Assessment Committee). The resolutions are appended in **Annexure-II.**

Item No: BoS / 2026 / EEE / UG / 19.4

Discussion on Selection of MOOC course for IV B. Tech, I-Sem, R23 Regulation

The BoS chairman initiated a discussion regarding the selection of a **MOOC (Massive Open Online Course)** for IV B. Tech, I-Semester under R23 Regulation. It was deliberated that **one MOOC** course shall be selected as open elective based on the student's choice for IV B. Tech, I-Semester under R23 Regulation and board members accepted the same. The BoS chairman also discussed the course structure and syllabus of IV B. Tech, R23 regulation for suggestions, the BoS members suggested the following recommendations.

P.B.C (P. B. Chennaiah) Lalitha (Dr. M. Raghuveer Lalitha) C.G (C. Ganesh)

Dr. N. Challammal

1. Recommended incorporating an **Introduction to Axial Flux Motors** under the **Electric Vehicle Technology** course to familiarize students with advanced motor configurations.
2. Recommended incorporating Types of EVs, EV Architecture, and Charging Methods into the **Electric Vehicle Technology** course for comprehensive understanding.
3. Proposed inclusion of the Difference between Isolated and Non-Isolated Converters in the **Switched Mode Power Conversion** course.
4. Suggested adding a comparative study of Soft Switching vs. Hard Switching techniques in the **Switched Mode Power Conversion** course.

Dr. K. Srinivas D.E.

1. Recommended organizing **field visits** to provide students with enhanced practical exposure and hands-on industry experience.
2. Proposed designating **Electrical Safety Practices and Standards** as a compulsory subject to ensure foundational safety knowledge across all students.

Item No: BoS / 2025 / EEE / UG / 19.5

Identification and Listing of External Examiners.

The BoS chairman listed out the external examiners from IITs, NITs and Universities. The list of examiners is presented in **Annexure-III.**

P. B. C

Dr. P. B. Chennaiah
Chairman

P.B.C (P.B. Chennaiah)

Co-Co. Reading Lalitha

E. Ganesh

Annexure-I

Action Taken Report from the 18th BoS Meeting:

Action Taken-1

In response to the suggestion made in the previous Board of Studies meeting, the concept of **Short Circuit Analysis (Unit 4)** has been removed and the concept of **sag and Tension and Corona** has been incorporated as **(Unit 4)** in the **Power Systems–II** course.

Revised Syllabus for Power Systems-II

Unit 1 Transmission Line Parameters **12**

Types of Conductors - Calculation of Resistance for Solid Conductors, Bundle Conductors, Skin effect, Proximity effect, Concept of GMR & GMD- Transposition of Power lines- Calculation of inductance for single phase and three phase, Single and Double circuit lines, Symmetrical and asymmetrical conductor configurations with and without transposition. Calculation of Capacitance for 2 wire and 3 wire systems, effect of ground on Capacitance, Capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems

Unit 2 Performance of Transmission Lines **10**

Classification of Transmission Lines-Short, medium and long line and their models representation - Nominal-T, Nominal-π and A, B, C, D Constants for symmetrical networks, Numerical Problems and solutions for estimating regulation and efficiency of all types of lines. Ferranti effect and Charging Current

Unit 3 Overhead Line Insulators **10**

Types of Insulators- Pin type, Suspension type and Strain Type, String efficiency and Methods for improvement, – Voltage Distribution, Calculation of String efficiency, Capacitance Grading and Static Shielding, Numerical Problems.

Unit 4 Sag and Tension and sag and Corona **10**

Sag and Tension Calculations with equal and unequal heights of towers, Effect of wind and ice on weight of conductor, Stringing chart, Sag template and its applications, Vibration and Vibration dampers, Numerical Problems.

Corona- factors affecting corona, critical disruptive voltage, critical voltages and Power loss due to Corona. Radio Interference.

Unit 5 Voltage Control and Power Factor Improvement and Compensation in Power Systems 10

Methods of voltage control, shunt and series capacitors / Inductors, tap changing transformers, synchronous phase modifiers, power factor improvement methods. Concepts of Load compensation, Load ability characteristics of overhead lines – Uncompensated transmission line – Symmetrical line – Radial line with asynchronous load – Compensation of lines.

P. B. Chennaiah (Coordinator) Lalitha (Co-ordinator) (C. Ganesh)

Action Taken-2

In response to the suggestion made in the previous Board of Studies meeting, the title of **Unit 3** in the **Renewable & Distributed Energy Technologies** course has been revised as **"Green Energy and Energy Storage"**, also fundamental concepts and principles of **fuel cells, hydrogen energy,** and related technologies have been included.

Unit 3 in Renewable & Distributed Energy Technologies

Unit 3 **Green Energy and Energy Storage** **10**

Green Energy: Types of Fuel Cells, Basic Operation of a **Fuel Cell, Operating principles of Hydrogen energy,** Benefits of hydrogen energy, hydrogen production technologies (electrolysis method only), hydrogen energy storage, applications of hydrogen energy, problem associated with hydrogen energy

Energy Storage: Stationary Battery Storage – Basics of Lead-Acid batteries, Battery Storage Capacity, Coulomb efficiency instead of energy efficiency, Battery Sizing. Different Battery storage technologies and comparison of their performance. Introduction to Super capacitors.

Action Taken-3

In response to the suggestion made in the previous Board of Studies meeting **Electrical Safety Standards** has been added in the **Unit 5** of **High Voltage Engineering** course.

Unit 5 in Renewable & Distributed Energy Technologies

Unit 5 **Testing of Materials & Electrical Apparatus** **10**

Measurement of D.C Resistivity, Measurement of Dielectric Constant and loss factor, Partial discharge measurements. Testing of Insulators and bushings, Testing of Isolators and circuit breakers, testing of cables, Testing of Transformers, Testing of Surge Arresters, Radio Interference measurements. **IEEE safety recommendations for high voltage testing.**

Action Taken-4

In response to the suggestion made in the previous Board of Studies meeting, the concept of **"Applications of various converters"** has been incorporated into the syllabus of the **"Power Electronics"** course.

Revised Syllabus for Power Electronics

Unit 1 **Power Switching Devices** **12**

Basic Structure and I-V Characteristics of Diode, Thyristor, MOSFET, IGBT; Turn on and Turn-off methods of SCR and their characteristics; Firing circuits and Commutation circuits for thyristor; Gate drive circuits for MOSFET, IGBT; Introduction to Gallium Nitride (GaN) and Silicon Carbide (SiC) Devices.

(P. B. V) (Lalitha, DRDO-Retd) (C. Ganesh)

(P. B. Chennoju)

Unit 2 **Rectifiers** **10**

Single-phase half-wave and full-wave rectifiers; Single-phase half controlled and fully controlled bridge thyristor rectifier with R and RL load with relevant waveforms; Three-phase half-wave and full-wave rectifiers; Three-phase half controlled and fully controlled bridge thyristor rectifier with R and RL load with relevant waveforms, Dual Converter, **Applications of Rectifiers** -Numerical problems.

Unit 3 **DC-DC Converters** **08**

Introduction to chopper; classification of choppers; concepts of duty ratio; control strategies; Power circuit, analysis and waveforms at steady state and average output voltage of Buck, Boost and Buck- Boost Converters. **Applications of DC-DC converter.**

Unit 4 **Inverters** **10**

Single phase Voltage Source inverters – operating principle – Voltage control techniques for inverters and Pulse width modulation techniques, single phase current source inverter with ideal switches, basic series inverter, single phase parallel inverter – basic principle of operation only, Three phase bridge inverters- VSI (180-degree mode) – Sinusoidal PWM - CSI - **Applications of DC-DC Inverter.** Numerical problems.

Unit 5 **AC Voltage Controllers & Cycloconverters** **10**

Single phase AC voltage controllers – operation- Single phase two SCRs in anti-parallel – With R and RL loads – RMS load voltage, current and power factor - wave forms – Numerical problems. Cycloconverters – Midpoint and Bridge connections - Single phase to single phase step-up and step-down cycloconverters with Resistive and inductive load, Principle of operation, Waveforms, output voltage equation, **Applications of Cycloconverters.**

P.B.V — D Lalitha

CP&D Chairman (Co-ordinator Lalitha) G Ganesh

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Annexure-II (Stakeholder's Feedback)

The following recommendations have been forwarded from the feedback committee and PAC to the BOS. The resolutions passed are provided point wise below:

S. No.	Decision About	Resolution
1	Conduct of guest lectures and workshops on contemporary technologies	Resolved to regularly organize guest lectures and workshops on recent and emerging technologies to keep students updated with industry advancements.
2	Arrangement of Industrial Visits for Students	Resolved to facilitate periodic industrial visits to provide students with enhanced practical exposure and real-world industry experience.
3	Permission for Student Internships	Resolved to permit students to undertake internships during the summer vacation to bridge the gap between academic learning and industry requirements.
4	Conduct of Coding Classes for Students	Resolved to organize regular coding classes for students to strengthen their programming skills and technical competency.
5	Conduct of Hands-on Experience Programs	Resolved to organize hands-on experience programs to enhance practical skills and applied learning among students.

P. B. Chowdary

Lalitha (Dr. Padma Lalitha)

G. Ramu

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Annexure-III (List of External Examiners)

S. No.	Examiner Name	Address
1	Dr. C. Srinivasarao	Professor, Dept. of EEE, GPCET, Kurnool
2	Dr. D. Lenine	Professor, Dept. of EEE, RGMCET, Nandyal
3	Dr. R. Sridhar	Professor, Dept. of EEE, SRMIST, Chennai.
4	Dr. V.V.K Reddy	Professor, Dept. of EEE, NBKRIST, SPSR, Nellore
5	Dr. Y. N. Vijay kumar	Professor, Dept. of EEE, SVCET, Chittor
6	Dr. D. Suresh	Professor, RNSIT, Bengaluru
7	Dr. D. Satya Narayana	Professor & HOD, RGMCET, Nandyal
8	Dr. C. Chandrasekhar	Professor, HOD, SVCEW, Tirupathi
9	Dr. K. Nagireddy	Professor, NBKR, Vakadu
10	Dr. R. Sumalatha	Professor, VCE, Hyderabad
11	Dr. G. Sambasiva Rao	Professor, R.V.R. & J.C. College of Engineering, Guntur
12	Dr. T. Gowri Manohar	Professor, Dept. of EEE, SVUCE, SVU, Tirupati
13	Dr. C. Kamal Basha	Professor, Dept. of EEE, MITS, Madanapalle
14	Dr. B. Vijaya Krishna	Associate Professor, Department of EEE, Bapatla Engineering College, Bapatla
15	Dr. J. Sreenivasulu	Assistant Professor, Department of EEE, JNTUCEA, Anantapur
16	Dr. Y. N. Vijay Kumar	Professor, Dept. of EEE, SVCET, Chittoor
17	Dr. D. Lenine	Professor, Dept. of EEE, RGMCET, Nandyal
18	Dr. R. Sridhar	Professor, Department of EEE, SRMIST, Chennai.
19	Dr. G. Sambasiva Rao	Professor, R.V.R. & J.C. College of Engineering, Guntur
20	Dr. P. Chandrasekhar	Associate Professor, Department of EEE, MGIT, Hyderabad
21	Dr. K. Vaisakh	Professor, Department of EEE, Andhra University, Visakhapatnam
22	Dr. P. Sujatha	Professor, Dept.of EEE, JNTU, Anantapur
23	Dr. K. Amaresh	Professor, Department of EEE, St. Peters Engineering College, Hyderabad
24	Dr. M. Senthilkumar	Professor, Department of EEE, Sona college of Technology Salem, Tamilnadu
25	Dr. P. Chandrasekhar	Associate Professor, Department of EEE, MGIT, Hyderabad
26	Dr. V. Somasekhar	Professor, Dept. of EEE, NIT Warangal
27	Dr. N. Chellammal	Associate Professor, Department of EEE, SRMIST, Chennai.
28	Dr. K. Udhayakumar	Professor, Department of EEE, Anna University, Chennai
29	Dr. D. Lenine	Professor, Department of EEE, RGMCET, Nandyal
30	Dr. M. Kiran Kumar	Associate Professor, Department of EEE, K L University, Guntur
31	Dr. T. Vinopraba	Associate Professor, EEE Department, NIT Puducherry
32	Dr. V. Nagabhaskar Reddy	Professor & HoD, Department of EEE, RGMCET, Nandyal

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S. No.	Examiner Name	Address
33	Dr. R. Sridhar	Professor, Department of EEE, SRMIST; Chennai.
34	Dr. M. Sushma	Professor, Department of EEE, JNTUCEH, Hyderabad
35	Dr. D. Sri Vidhya	Associate Professor, K. S. Rangasamy College of Technology, Tiruchengode
36	Dr. Sailaja Kumari M	Professor, Department of EEE, NIT Warangal
37	Dr. P. V. Prasad	Professor, Department of EEE, CBIT, Hyderabad
38	Dr. M. Damodar Reddy	Professor, Department of EEE, SVUCE, SVU, Tirupati
39	Dr. K. Chandra Sekhar	Professor, Department of EEE, RVR & JC college of Engineering, Guntur.
40	Dr. K. Amaresh	Professor, Department of EEE, KSRMCE, Kadapa
41	Dr. S. S. Dash	Professor, Department of EEE, Government College of Engineering, Orissa
42	Dr. Y. V. Siva Reddy	Professor, Department of EEE, GPREC, Kurnool
43	Dr. S. Suresh Reddy	Professor, Department of EEE, NBKRIST, Nellore
44	Dr. K. Sujatha	Professor, Department of EEE, Dr. M.G.R Educational Research Institute
45	Dr. V. Usha Reddy	Associate Professor, Department of EEE, SVUCE, SVU, Tirupati
46	Dr. C. Srinivasarao	Professor, Department of EEE, GPCET, Kurnool
47	Dr. E. Vidya Sagar	Professor, Department of EEE, Osmania University, Hyderabad
48	Dr. R. Rathinam	Professor, Department of EEE, SRMIST, Chennai.
49	Dr. Madhuri Avinash Chaudhari	Professor, Department of EEE, Visvesvaraya National Institute of Technology, Nagpur
50	Dr. K. Jithendra Gowd	Assistant Professor, Department of EEE, JNTUA College of Engineering, Kalikiri

P.B.V (P.B Chennaiah)

Prof. Reddy Lalitha

C. Ganesh

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Signature of the Board Members

S. No.	Name of the Board Member	Signature
1.	Dr. P. B. Chennaiah	
2.	Dr. M. Padma Lalitha	
3.	Mr. C. Ganesh	
4.	Dr. Subharansu Sekhar Dash	Attended through online
5.	Dr. N. Chellammal	Attended through online
6.	Dr. R. Sreenivasa Rao	Attended through online
7.	Dr. K. Sreenivas	Attended through online
8.	Dr. C. Santhi Durganjali	Attended through online

P.B.C
(P.B. Chennaiah)

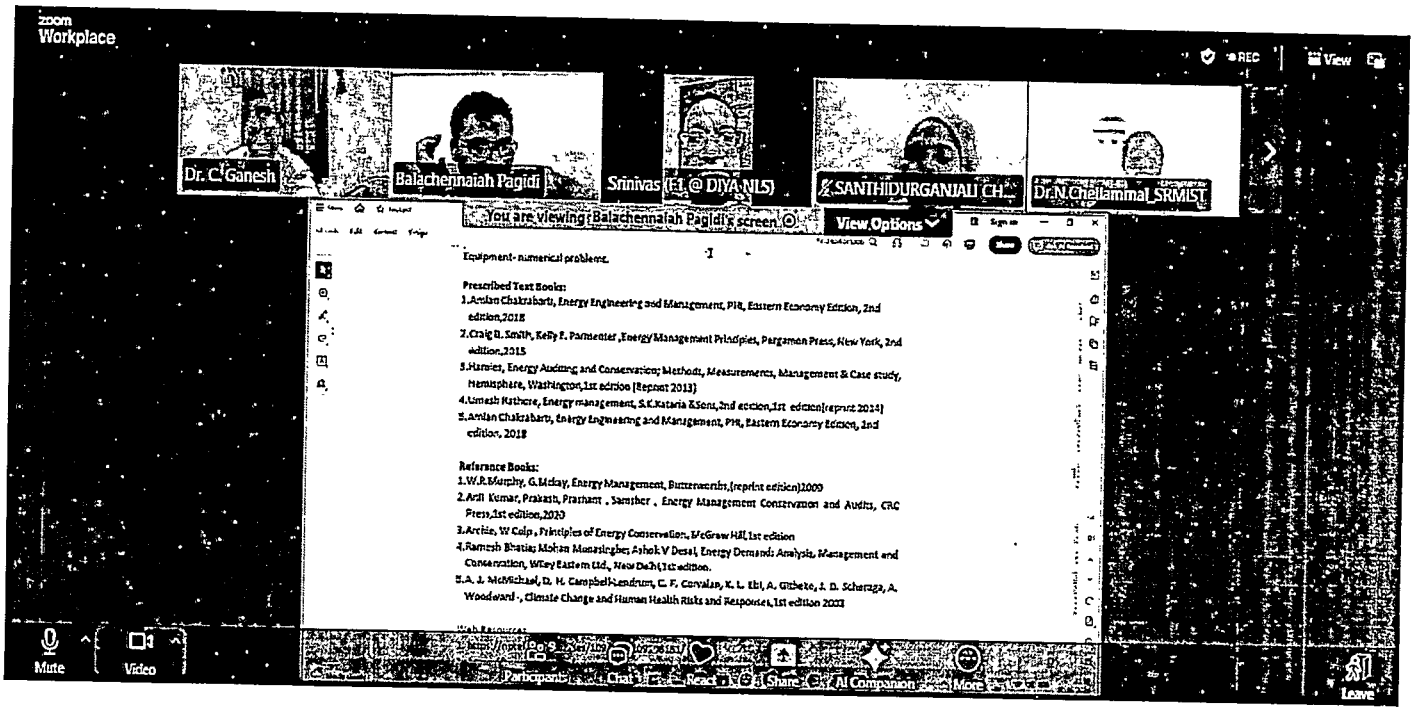
(Dr. M. Padma Lalitha)

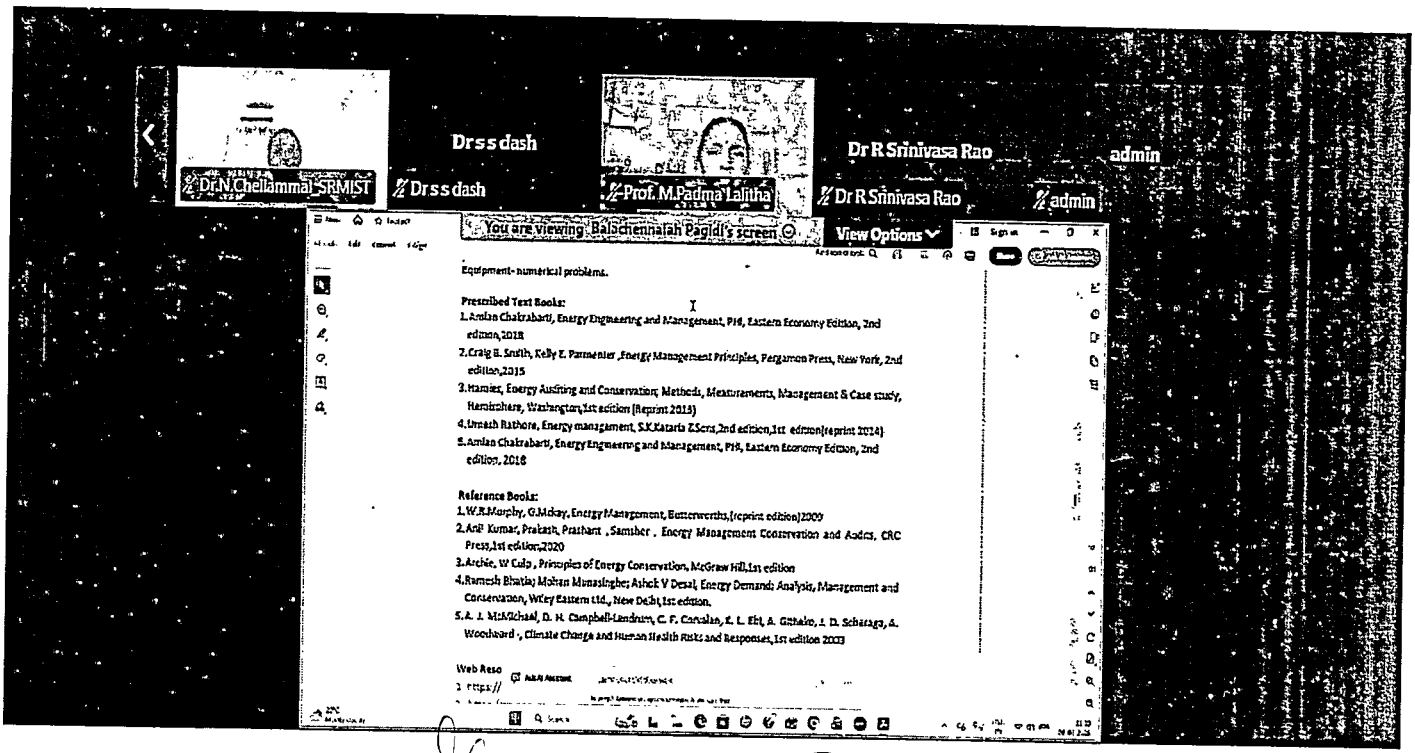
C Ganesh

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Snapshots During 19th BoS Meeting





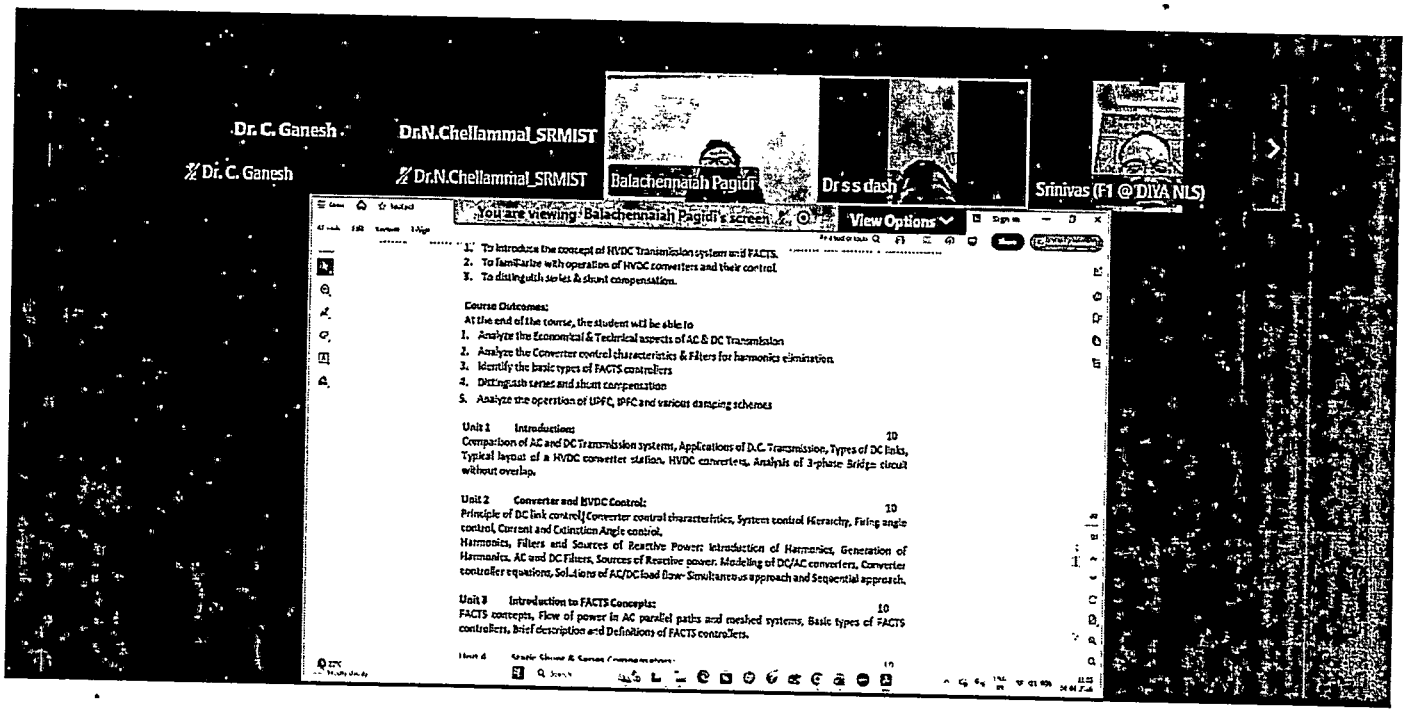
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(Dr. regarding lalitha)

G.E (C. Ganesh)

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P.B Chennaiah

Gpr M. Padma Lalitha

G. Ganesh

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Academic Year: 2025 - 26

Meeting : Board of Studies – Mechanical Engineering

Date and Time : 06th June 2026 at 10:30 AM

Venue : Annamacharya Institute of Technology & Sciences, Rajampet.

Minutes of 19th Board of Studies – Mechanical Engineering held on 06th June 2026 (Hybrid Mode) at AITS, Rajampet.

Members Present:

S.No	Name of the Board Member	Designation	Institute/ Industry	Role
		INTERNAL MEMBERS		
1.	**Dr. G. Suresh Babu**	Assistant Professor & Head, Department of Mechanical Engineering	Annamacharya Institute of Technology & Sciences, Rajampet	Chairman
2.	**Mr. G. Amarnath**	Assistant Professor, Department of Mechanical Engineering	Annamacharya Institute of Technology & Sciences, Rajampet	Machine Design Module
3.	**Mr. C. Ramanjaneyulu**	Assistant Professor, Department of Mechanical Engineering	Annamacharya Institute of Technology & Sciences, Rajampet	Thermal Engineering Module
4.	**Dr. N. Kishore Kumar**	Assistant Professor, Department of Mechanical Engineering	Annamacharya Institute of Technology & Sciences, Rajampet	CAD/CAM Module
		EXTERNAL MEMBERS		
5.	**Dr. Hema Pothur**	Professor & Head Department of Mechanical Engineering	SVU College of Engineering, SV University, Tirupati	Academic Expert
6.	**Dr. N. Venkaiah**	Professor, Department of Mechanical Engineering	Indian Institute of Technology, Tirupati	Academic Expert
7.	**Prof. B. Durga Prasad**	Professor, Department of Mechanical Engineering	JNTUA College of Engineering, JNTUA University, Ananthapuramu	University Nominee
8.	**Mr. R. Guravaiah**	Deputy Executive Engineer	Rayalaseema Thermal Power Project, Muddanur	Industry expert
9.	**Mr. D Mani Obul Reddy**	Data engineer	Tiger Analytics India consulting Pvt Ltd, Bengaluru	Meritorious Alumni with M.Tech.

(G. Amarnath) (N. Kishore Kumar) (Ramanjaneyulu. C)

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Agenda:

Item No.	Particulars
BoS/2026/ME/UG /19.1	Ratification of 18th Board of studies meeting held on 21.06.2025
BoS/2026/ME/UG /19.2	Ratification of 18th Board of studies - Action taken report
BoS/2026/ME/UG /19.3	Discussion on the R23 ME IV B.Tech. course structure, with a detailed discussion on the IV year syllabi
BoS/2026/ME/UG /19.4	To consider and approve the panel of examiners for external examinations for the Academic Year 2025-26
BoS/2026/ME/UG /19.5	Any other item with the permission of the Chair.

Minutes of the Meeting:

The 19th Board of Studies meeting of the Mechanical Engineering Department was convened under the chairmanship of Dr. G.Suresh Babu, Assistant Professor and Head. After extending a warm welcome to the members, the Head invited the external experts to provide their opening remarks. The meeting then proceeded to discuss the formal agenda items, covering the following significant topics:

Item No 19.1: Ratification of 18th Board of studies meeting.

- The minutes of the 18th Board of Studies meeting of the Department of Mechanical Engineering, Annamacharya Institute of Technology & Sciences (Autonomous), Rajampet, held on June 21, 2025, were presented by the Chairman for ratification. After detailed discussions, the Board ratified the minutes.

Item No 19.2: Ratification of 18th Board of studies - Action taken report

- The Chairman presented the Action Taken Report (ATR) on the decisions of the 18th Board of Studies meeting, held on June 21, 2025. After thorough deliberations and discussions, the Board ratified the ATR.

Item No 19.3: Discussion on R23 IV B.Tech. course structure, with a detailed discussion on IV-year syllabi.

- The Chairman presented the proposed R23 B.Tech. Mechanical Engineering course structure for the IV Year, highlighting the semester-wise credit distribution and the composition of Professional Core Courses, Professional Electives, Open Electives, Laboratory Courses, Mini Project with Seminar, and Project Work.
- The Board reviewed the detailed syllabi of all IV-Year courses, including Lecture–Tutorial–Practical (L-T-P) structure, Course Outcomes (COs), and their mapping with Programme Outcomes (POs). The suggestions and recommendations offered by the Board members were deliberated upon and the following resolutions were made.
- **Suggestions and Recommendations of the Board:**

1. The Board observed that both Mechanical Vibrations and Finite Element Methods offered under Professional Elective–IV belong to the Design specialization, whereas no Design-oriented course was available in Professional Elective–V. To ensure balanced representation of specialization domains across elective pools, it was resolved to shift Mechanical Vibrations from Professional Elective–IV to Professional Elective–V and move Non-Destructive Testing from Professional Elective–V to Professional Elective–IV.
2. The Board recommended that students may be given the flexibility to select MOOC/NPTEL courses based on their interests from the list of approved courses.
3. An external expert suggested the inclusion of Data Science concepts either as a separate course or as a module within the AI & ML domain. It was resolved to explore the possibility of addressing this recommendation through suitable NPTEL/MOOC offerings.
4. The Board suggested that Total Quality Management and 3D Printing Technologies, which are presently offered to other branches, may also be considered as professional courses for Mechanical Engineering

(G. Amarnath) (Dr. N. Ic is not available) (Ramanjaneyulu. C)

students. In response, it was clarified that Total Quality Management is already offered as a Professional Elective in IV-I Semester and 3D Printing Technologies is offered as a Skill Enhancement Course in III-II Semester.

5. The Board recommended initiating project work during the first semester of the final year to facilitate timely completion and improve project outcomes.
6. The Board suggested allocating 2 Lecture Hours and 1 Tutorial Hour for the Mechanical Vibrations course due to its analytical and numerical nature. It was explained that the present regulations do not provide tutorial hours for the course. However, adequate problem-solving sessions will be incorporated within the allotted lecture hours.
7. The Board recommended adopting a contemporary title for the course "Non-Conventional Energy Sources." After discussion, it was resolved to be the course as same which more appropriate.
8. In the Mechatronics & MEMS course, the Board suggested combining the units on Sensors and Actuators and introducing case studies. After deliberation, it was resolved to retain the existing unit structure while incorporating relevant case studies covering the entire syllabus at the end of Unit V.
9. The Board suggested providing practical exposure to sensors and actuators through laboratory demonstrations. It was noted that the department's Idea Lab already possesses a limited number of sensors and actuators that can be utilized for demonstration purposes.
10. The Board recommended standardizing the prescribed textbook references by listing the author names prior to the textbook titles across all course syllabi.
11. For the Non-Destructive Testing course, the Board recommended the inclusion of the following reference book: I. J. Khan, Non-Destructive Testing, S. K. Kataria & Sons, New Delhi.
12. In the Smart Manufacturing course, the Board suggested including the topic Natural Frequency Testing (NFT). After discussion, it was resolved to incorporate Natural Frequency Testing (NFT) under Unit II as part of Predictive Maintenance and Condition Monitoring applications in Smart Manufacturing.

Item No 19.4: To consider and approve the panel of examiners for external examinations for the Academic Year 2026-27.

- The chairman presented the list of external examiners and subject experts to the members for approval. After discussions, it is resolved to include Ph.D. holders from the reputed institutions as examiners and subject experts. The list was ratified and appended in Annexure – II.

Item No 19.5: Any other item with the permission of chair.

- **NIL**

Dr. G. Suresh Babu, Chairman of the Board of Studies, proposed a Vote of Thanks. He extended his sincere gratitude to each BOS member for their active participation and valuable contributions to the course discussions.

Chairman – BOS
Department of ME

Encl: 1. Attendance of BOS Meeting.

MS Teams Meeting Recording Link:
19th Board of Studies (BoS) Meeting – Mechanical Engineering (R23 Regulations) - AITS Rajampet-20260606_103908-Meeting Recording.mp4

(G. Amarnath) (Dr. Sasikumar Kumaravel) (Ramanjaneyulu. C)

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Action Taken Report on 19th BOS Meeting – Dept. of ME held on 06/06/2026

- Action taken report on the decisions of the 19th BOS Meeting – Department of Mechanical Engineering held on 06/06/2026.
- To implement the decisions taken during the meeting of the BOS, the following actions were taken.

Agenda Item	Action Taken
Item No. 19.1: Ratification of 18th Board of Studies Meeting held on 21.06.2026	Ratified
Item No. 19.2: Ratification of 18th Board of Studies – Action Taken Report	Ratified
Item No. 19.3: Discussion on the R23 IV B.Tech. Course Structure, with a detailed discussion on the IV Year Syllabi	The suggestions and recommendations made by the BoS experts were reviewed and implemented wherever applicable. Necessary revisions were carried out in the IV Year Course Structure and Syllabi, including restructuring of Professional Elective pools, revision of course titles, incorporation of Natural Frequency Testing (NFT) in Smart Manufacturing, inclusion of case studies in Mechatronics & MEMS, standardization of textbook references, updating of reference books, and other syllabus refinements in accordance with academic requirements, industry relevance, and Outcome-Based Education (OBE) practices.
Item No. 19.4: To consider and approve the panel of examiners for external examinations for the Academic Year 2026-27	The approved panel of external examiners and subject experts was implemented for the conduct of external examinations.
Item No. 19.5: Any Other Item with the Permission of Chair	NIL

- The Action Taken Report shall be presented in the subsequent Board of Studies meeting for ratification.

Chairman – BOS
Department of ME
AITS, Rajampet

ANNAMACHARYA
INSTITUTE OF TECHNOLOGY & SCIENCES
An AUTONOMOUS Institution, New Boyanapalli, Rajampet – 516126

Department of Mechanical Engineering

Date: 04.06.2026

CIRCULAR

With reference to the Circular No. AU/Dean's Office/Circular/95, dated 03.06.2026, issued by the Dean, School of Engineering, the **19th Board of Studies (BoS) Meeting** of the Department of Mechanical Engineering for **R23 Regulations** is scheduled as per the details given below:

Date: 06.06.2026
Time: 10:30 AM
Venue: Online Mode in Microsoft Teams

Agenda for Discussion

1. Ratification of 18th Board of studies meeting held on 21.06.2025.
2. Ratification of 18th Board of studies - Action taken report
3. To discuss and finalise the course structure of IV Year Mechanical Engineering under R23 Regulations and to deliberate in detail on the syllabus of the IV Year courses.
4. Approval of the list of examiners for various courses.
5. Any other item with the permission of the Chair.

All the members of the Board of Studies are requested to participate actively in the discussions.

Dr. G. Suresh Babu
Head of the Department & Chairperson – BoS
Department of Mechanical Engineering

ANNAMACHARYA
INSTITUTE OF TECHNOLOGY & SCIENCES
An AUTONOMOUS Institution, New Boyanapalli, Rajampet – 516126

Department of Mechanical Engineering

Attendance of 19th Board of Studies meeting in Dept. of Mechanical Engineering

Date : 06/06/2026 10:30 a.m. **Mode : Hybrid Mode**

Details of External and Internal BoS members attended for the meeting

Sl. No.	Name of the Member	Designation	Signature
1	**Dr. G. Suresh Babu,** Assistant Professor & Head, Department of Mechanical Engineering, AITS, Rajampet email ID: aits.med.gsb@gmail.com Mobile: 9949224453	Chair Person	
	External Experts		
2	**Dr. Hema Pothur,** Professor, Department of Mechanical Engineering, SVU College of Engineering, SV University, Tirupati. email ID: hemasvumech@gmail.com Mobile: 9490247265	Academic Experts	Attended Online
3	**Dr. N. Venkaiah,** Professor, Department of Mechanical Engineering, Indian Institute of Technology Tirupati. email ID: venkaiah@iittp.ac.in Mobile: 9441933382	Academic Experts	Attended Online
4	**Prof. B. Durga Prasad,** Professor, Department of Mechanical Engineering, JNTUA College of Engineering, JNTUA University, Ananthapuramu. email ID: mukdhajntua@gmail.com Mobile: 9441074399	University Nominee	Attended Online
5	**Mr. G. Guravaiah,** Chief Engineer, Rayalaseema Thermal Power Project, Muddanur email ID: guruvaiahmech@gmail.com Mobile: 9493121485	Industry expert	Attended Online
6	**Mr. D Mani Obul Reddy,** Data Engineer Tiger Analytics india consulting Pvt Ltd, Bengaluru. email ID: maniobulreddy@gmail.com Mobile: 91605 62264	Meritorious Alumni	Attended Online
	Internal Experts		
7	**Mr. G. Amarnath,** Assistant Professor, Department of Mechanical Engineering, AITS, Rajampet email ID: aits.med.ga@gmail.com Mobile: 9502378737	Machine Design Module	
8	**Mr. C. Ramanjaneyulu,** Assistant Professor, Department of Mechanical Engineering, AITS, Rajampet email ID: aits.med.crmnl@gmail.com Mobile: 9492316417	Thermal Engineering Module	
9	**Dr. N. Kishore Kumar,** Assistant Professor, Department of Mechanical Engineering, AITS, Rajampet. email ID: aits.med.nkk@gmail.com Mobile: 9985898089	CAD/CAM Module	

(Dr. G. Suresh Babu)
HOD & Chair Person

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

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Academic Year: 2025 – 26

Board of Studies (BoS) Meeting in Department of Mechanical Engineering

Date & Time: 06.06.2026 10:30 AM **Regulation:** R23
Venue: Online Microsoft Teams

IV Year – I Semester Subjects Experts List

Subject Title & Code - Mechanical Vibrations (23A037AT)

Name & Designation	Address	Phone No & e-Mail Address
Dr.P.Ravi Kumar Professor	CMR College of Engineering and Technology, Hyderabad,-501401	9293139553, 9248001456 pravikumar@cmrcet.ac.in
Dr.M.Vamsee Krishna Professor	SV College of Engineering, Karakambadi Road, Tirupati-517501	8978407734 mamidivk@gmail.com
Dr.K.Mallikarjuna Professor	Ashoka women's engineering College, Kurnool,-518218	7660916753 mallikarjuna.gtl@gmail.com
Dr.B.Sidda Reddy Professor	RGM College of engineering &Technology, Nandyal, -518501	9440844600 bsrrgmcet@gmail.com
Dr.B.Sidda Reddy Associate Professor	Siddhartha Educational Academy Group of Institutions,Tirupati-517507	7989112188 sneha@siddarthaedu.in

Subject Title & Code - Finite Element Methods (23A037BT)

Name & Designation	Address	Phone No & e-Mail Address
Dr. A. Damodar Reddy Associate Professor	JNTU College of Engineering, Pulivendula, YSR Kadapa(Dt), 516390	9492036921 adamodarareddy@gmail.Com
Dr B.Vinod Associate Professor,	Siddharth Institute of Engineering and Technology, Puttur	7702969673 vinod.c2009@gmail.com
Dr. GV R Seshagiri Rao Professor,	IARE, Institute of Aeronautical Engineering. Hyderabad.	9490074689 gvr.seshagirirao@iare.ac.in
Dr. T. Hari Prasad Professor,	Mohan Babu University, Rangampet, Tirupathi.	9885404470 hariprasad.t@mbu.asia
Dr. K. Thirupathi reddy Professor,	Department of Mechanical Engineering, RGM, Nandyala-518501	9441016367 hme@rgmcet.edu.in

Subject Title & Code - Non-Conventional Energy Sources (23A037CT)

Name & Designation	Address	Phone No & E-Mail Address
Dr.S.Shakeel Ahamed, Associate Professor	KSRMCE,KADAPA	9441404099, shakeelahamed@ksrmce.ac.in
Dr. C. Vijay bhaskar reddy, Professor	SVCET- Chittor	7729999156, hodme@svcetedu.org
Dr. K.L Narasimhamu, Professor	Sreevidyanikethan college of Engineering, Rangampet, Tirupathi	9440941411 , klsimha@gmail.com
Dr. GV R Seshagiri Rao Professor,	IARE, Institute of Aeronautical Engineering. Hyderabad.	9490074689 gvr.seshagirirao@iare.ac.in

(G. Amarnath) (CDR. Kishore Kumar N) (Ramanjaneyulu. C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

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Subject Title & Code - Mechatronics & MEMS (23A037DT)

Name & Designation	Address	Phone No & e-Mail Address
Dr. K.L Narasimhamu, Professor	Sree Vidyanikethan college of Engineering, Rangampet, Tirupathi	9440941411 , klsimha@gmail.com
Dr.A. Mahamani, Professor	Sri Venkateswara College of Engineering and Technology, Chittoor	6300256313, arumugammahamani2017@gmail.com
Dr. A. Purushotham, Professor	Sreenidhi Institute of Science & Technology,Yamnampet, Hyderabad	9848086219, apurushotham@sreenidhi.edu.in
Dr. K .Mallikarjuna, Professor	Pullaiah College of Engineering, Kurnool	7660916753 kmreddyce@gpcet.ac.in

Subject Title & Code - Applications of Computational Fluid dynamics (23A037ET)

Name & Designation	Address	Phone No & e-Mail Address
Dr.Y.Rameswar Reddy , Associate Professor	Department of Mechanical Engineering, JNTU College of Engineering, Pulivendula	7660916753 yrameswarareddy.mech@jntua.ac.in
Dr.B.Sidda Reddy, Professor	Department of Mechanical Engineering, RGM College of Engineering, Nandyal	9440844600 bsrrgmcet@gmail.com
Dr.K.Mallikarjuna , Professor	Ashoka Women's Engineering College, Kurnool.	7660916753 mallikarjuna.gtl@gmail.com
Dr.N.Rajesh, Professor	Department of Mechanical Engineering, SV College of Engineering, Tirupati.	9985289928 rajesh06@gmail.com
Dr.B.Konda Reddy, Professor	PBR Visvodaya Institute of Technology and Science, Kavali.	9440141605 ce_vits@visvodayaata.ac.in

Subject Title & Code - Refrigeration & Air Conditioning (23A037FT)

Name & Designation	Address	Phone No & E-Mail Address
Dr. S Altaf Hussain, Professor	Department of Mechanical Engineering, RGM College of Engineering, Nandyal	9494738100, rgmaltaf1@gmail.com
Dr. G Bala Narasimha, Assistant Professor	Madanapalle Institute of Technology & Science, Madanapalle	9515795349, balanarasimha.g@gmail.com
Dr. S Solomon Raj, Associate Professor	Department of Mechanical Engineering, CBIT-Hyderabad	9949655133, solomonraj_mech@cbit.ac.in
Dr. K. Raja Narender Reddy, Professor & Head	Dept. of ME, KITS Warangal	9396431009, krnr.me@kitsw.ac.in

Subject Title & Code - Automation & Robotics (23A037GT)

Name & Designation	Address	Phone No & e-Mail Address
Bharat Kumar Chigilipalli, Assistant Professor	Vignan's Institute of Information Technology, Visakhapatnam	8500104105 bharat@vignaniit.edu.in
Dr. Potta Sivaiah, Associate Professor	Madanapalle Institute of Technology & Science, Madanapalle.	9848360295 sivaiah.337@gmail.com
Dr. V. Chengal Reddy, Associate Professor	Annamacharya Institute of Technology & Sciences, Tirupati	8019956112 vcreddyaits@gmail.com
Dr.P.Ravi Kumar, Professor	CMR College of Engineering and Technology, Hyderabad, -501401	9293139553, 9248001456 pravikumar@cmrcet.ac.in
Dr G Bala Narasimha, Assistant Professor	Madanapalle Institute of Technology & Science, Madanapalle	9515795349 balanarasimha.g@gmail.com

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Subject Title & Code - Non-Destructive Testing (23A037HT)

Name & Designation	Address	Phone No & e-Mail Address
Dr. P. Sivaiah, Associate Professor	Madanapalle Institute of Technology & Science, Madanapalle	9848360295, sivaiahp@mits.ac.in
Dr G Bala Narasimha, Assistant Professor	Madanapalle Institute of Technology & Science, Madanapalle	9515795349 balanarasimha.g@gmail.com
Dr. V Phanindra Bogu, Assistant Professor	VJIT, Hyderabad	9866046824, phanindrabogu@vjit.ac.in
Dr. A Manmadha Chary, Assistant Professor	IFHE University, Hyderabad	9885660279, manmadhachary@ifheindia.org

Subject Title & Code - Total Quality Management (23A037IT)

Name & Designation	Address	Phone No & e-Mail Address
Dr.S.Shakeel Ahamed, Associate Professor	KSRMCE, Kadapa	9441404099, shakeelahamed@ksrmce.ac.in
Dr. N.Venkaiah, Associate Professor	Indian Institute of Technology, Tirupati	8772503035, venkaiah@iittp.ac.in
Dr.M.P.Rangaiah, Assistant Professor	JNTUA College of Engineering (Autonomous), Ananthapuramu	9391686488, mpranga9@gmail.com
Dr.A.Damodara Reddy, Assistant Professor	JNTUA College of Engineering (Autonomous), Pulivendula	9492036921, damodar.mech@jntua.ac.in

Subject Title & Code - Smart Manufacturing (24AMEC6AT)

Name & Designation	Address	Phone No & e-Mail Address
Dr. P. Hema, Professor	Sri Venkateswara University College of Engineering, Tirupati,	9490247265 hema_pothur@yahoo.com
Dr. K. Dharma Reddy, Professor	Sri Venkateswara University College of Engineering, Tirupati,	9494697899, 9493105099 kdharmareddy@gmail.com
Dr.P.Venkataramaiah, Professor	Sri Venkateswara University College of Engineering, Tirupati,	08772289445 pvramaiah@gmail.com
Dr.Ch.R.Vikram Kumar, Professor	NBKR Institute of Science and Technology, Vidyanagar.	9490321975 mehod@nbkrist.org
Dr. G. Bala Narasimha, Assistant Professor	Madanapalle Institute of Technology & Science, Madanapalle	9515795349 balanarasimha.g@gmail.com

Subject Title & Code - 3D Printing Technologies (23A037MT)

Name & Designation	Address	Phone No & e-Mail Address
Dr. C. Vijay bhaskar reddy, Professor	SVCET- Chittoor	7729999156, hodme@svcetedu.org
Dr.M.Srinivasulu, Professor	NBKRIST, Vidyanagar	9440740444, mslu544@gmail.com
Dr. B. Sudheer Prem Kumar, Professor	J.N.T. University, Hyderabad	9849451103, bsudheerpk@jntuh.ac.in
Dr. R. Meenakshi Reddy, Associate Professor	G. Pulla Reddy college of engineering, Kurnool	9000321874, rmreddy123@gmail.com

(Ramaseenulu-C) DD-I Siphore Incharge N (G. Amarnath)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering
R23 Regulations B.Tech. Mechanical Engineering IV Year Course Structure

IV Year I Semester							
S.No.	Category	Code	Title	L	T	P	Credits
1	PC	23A0371T	AI & ML for Mechanical Engineering	3	0	0	3
2	HSSM	23AHS7AT 23AHS7BT 23AHS7CT	**Management Elective Course- II** 1. Business Ethics and Corporate Governance 2. E-Business 3. Management Science	2	0	0	2
3	PE	23A037AT 23A037BT 23A037CT 23A037DT 23A037ET	**Professional Elective-IV** 1. Non-Destructive Testing 2. Finite Element Methods 3. Non-Conventional Energy Sources 4. Mechatronics & MEMS 5. Applications of Computational Fluid dynamics	3	0	0	3
4	PE	23A037FT 23A037GT 23A037HT 23A037IT 23A037JT	**Professional Elective-V** 1. Total Quality Management 2. Mechanical Vibrations 3. Refrigeration & Air Conditioning 4. Automation & Robotics 5. Smart Manufacturing	3	0	0	3
5	OE		**Open Elective – III**	3	0	0	3
6	OE	23A037KT	**Open Elective – IV (MOOCs - Interdisciplinary)**	3	0	0	3
7	SEC	23A0372L	Introduction to Drone Technology	0	1	2	2
8	MC	23AHS79T	Gender Sensitization	2	0	0	0
9	INTERN	23A0373I	Evaluation of Industry Internship	0	0	0	2
			Total	18	1	04	21

Category	Credits
Professional Core	3
Humanities and Social Science including Management	2
Professional Elective	6
Open Elective	6
Skill Enhancement course	2
Internship	2
Total Credits	**21**

Open Elective – III

S.No.	Course Code	Course Name	Offered by the Dept.
1	23A017GT	Building Materials and Services	Civil
2	23A017HT	Environmental Impact Assessment	
3	23A017IT	Geo-Spatial Technologies	
4	23A017JT	Solid Waste Management	
5	23A027IT	Smart Grid Technologies	EEE
6	23A027JT	Electric Vehicles	
7	23A0474AT	Microprocessors and Microcontrollers	ECE
8	23A0475BT	Transducers and Sensors	
9	23A057IT	Data Base Management Systems	CSE & Allied/IT

10	23A057JT	Cyber Security	
11	23A057KT	Introduction to Computer Networks	
12	23A057LT	Internet of Things	
13	23A057MT	Introduction to Quantum Computing	
14	23AHS71T	Wavelet transforms and its applications	Mathematics
15	23AHS75T	Financial Mathematics	
16	23AHS72T	Smart Materials and Devices	Physics
17	23AHS7AT	Introduction to Quantum Mechanics	
18	23AHS76T	Sensors And Actuators for Engineering Applications	
19	23AHS73T	Green Chemistry and Catalysis for Sustainable Environment	Chemistry
20	23AHS77T	Chemistry Of Nanomaterials and Applications	
21	23AHS74T	Employability Skills	Humanities
22	23AHS78T	Literary Vibes	

Open Elective – III (Offered to the other departments)

IV Year I Semester							
S.No.	Category	Code	Title	L	T	P	Credits
1	OE	23A037LT	Total Quality Management	3	0	0	3
2	OE	23A037MT	3D Printing Technologies	3	0	0	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering
R23 Regulations B.Tech. Mechanical Engineering IV Year Course Structure

IV Year II Semester							
S.No.	Category	Code	Title	L	T	P	Credits
1	INTERN	23A0381I	Internship	-	-	24	4
2	PR	23A0382P	Project	-	-	-	8
			Total	-	-	24	12

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	AI & ML for Mechanical Engineering
Category:	PC
Course Code:	23A0371T
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Knowledge of Artificial Intelligence, focusing on intelligent agents, problem-solving techniques, and state-space search approaches.
2. To Understand and apply various problem-solving and search techniques, including uniform and heuristic search strategies in artificial intelligence.
3. To Explore and apply local search techniques for solving Constraint Satisfaction Problems (CSPs) and adversarial search strategies to make optimal decisions.
4. To Apply various statistical reasoning techniques for knowledge representation and reasoning in AI, as well as logic programming and reasoning methods.
5. To Familiar in fundamental concepts of Machine Learning techniques, as well as classification, regression, clustering problems, and an introduction to neural networks and deep learning.

Course Outcomes:

At the end of the course, the student will be able to

1. Design intelligent agents, define problems using state-space models, and apply AI techniques.
2. Implement and compare different search algorithms (both uniform and heuristic), apply and analyze appropriate strategies for solving AI problems.
3. Solve CSPs using local search methods and implement adversarial search algorithms to make optimal decisions in competitive game scenarios.
4. Utilize statistical and logical reasoning methods, to represent knowledge and perform forward and backward reasoning in AI applications.
5. Understanding and apply various machine learning techniques, along with an introduction to neural networks and deep learning.

Unit 1 Introduction to Artificial Intelligence and Problem-Solving Agent **10**

Problems of AI, AI technique, Tic –Tac – Toe problem. Intelligent Agents, Agents & environment, nature of environment, structure of agents, goal-based agents, utility-based agents, learning agents. Defining the problem as state space search, production system, problem characteristics, and issues in the design of search programs.

Unit 2 Search Techniques **10**

Problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies. Heuristic search strategies Greedy best -first search, A* search, AO* search, memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search.

Unit 3 Constraint Satisfaction Problems and Game Theory **09**

Local search for constraint satisfaction problems. Adversarial search, Games, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, additional refinements, iterative deepening.

09

Unit 4 **Knowledge & Reasoning: Statistical Reasoning**
Probability and Bays 'Theorem, Certainty Factors and Rule-Base Systems, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic. AI for knowledge representation, rule-based knowledge representation, procedural and declarative knowledge, Logic programming, Forward and backward reasoning.

10

Unit 5 **Introduction to Machine Learning: Exploring sub-discipline of AI**
Machine Learning, Supervised learning, Unsupervised learning, Reinforcement learning, Classification problems, Regression problems, Clustering problems, Introduction to neural networks and deep learning.

Prescribed Textbooks:

1. S. Russell and P. Norvig, —Artificial Intelligence: A Modern Approach||, Prentice Hall, Third Edition, 2015.
2. Nils J. Nilsson, —Artificial Intelligence: A New Synthesis||, 1st Edition, Morgan-Kaufmann, 1998.

Reference Books:

1. Elaine Rich, Kevin Knight, & Shiva shankar B Nair, -Artificial Intelligence||, McGraw Hill, 3rd ed.,2017.
2. Patterson, —Introduction to Artificial Intelligence & Expert Systems||, Pearson, 1st ed. 2015.
3. Saroj Kaushik, —Logic & Prolog Programming||, New Age International, 1st edition, 2002.
4. Joseph C. Giarratano,Gary D. Riley, —Expert Systems: Principles and Programming||, 4th Edition, 2007.

Online Learning Resources:

- https://nptel.ac.in/courses/113104517
- https://nptel.ac.in/courses/127104664
- https://nptel.ac.in/courses/110104164
- https://nptel.ac.in/courses/106106226

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A0371T.1	3	3	2	1	2	-	-	-	-	-	-	1	-	-
23A0371T.2	3	3	2	2	3	-	-	-	-	-	-	1	-	-
23A0371T.3	3	3	3	2	2	-	-	-	1	-	-	1	-	-
23A0371T.4	3	3	2	2	2	-	-	-	-	1	-	1	-	-
23A0371T.5	3	3	3	2	3	-	-	-	-	1	-	2	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Non-Destructive Testing
Category:	PE
Couse Code:	23A037AT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To introduce the principles, types, and safety aspects of various non-destructive testing (NDT) techniques including radiographic and ultrasonic methods.
2. To explain the theory, equipment, and evaluation procedures for ultrasonic, liquid penetrant, eddy current, and magnetic particle tests.
3. To familiarize students with advanced thermal and infrared inspection techniques and their applications.
4. To examine the use of specialized materials, sensors, and methods in thermal and IR-based NDT techniques.
5. To explore the wide-ranging industrial applications of NDT in fields such as aerospace, automotive, railways, and pressure vessel inspection.

Course Outcomes:

At the end of the course, the student will be able to

1. Demonstrate the working principles, equipment, and safety considerations in radiographic and ultrasonic NDT methods and apply and analyze the different methods.
2. Apply appropriate NDT techniques such as liquid penetrant, eddy current, and magnetic particle testing to analyze defect detection to solve the problems.
3. Analyze the effectiveness and limitations of various NDT methods in real-world testing scenarios and create the solutions.
4. Evaluate and, create thermal and infrared NDT methods for different materials and structural applications, especially in aerospace and electronics.
5. Illustrate the application of NDT techniques in diverse industrial domains and recommend suitable testing methods for specific components.

Unit 1 Introduction to non-destructive testing 8

Radiographic test: Sources of X and Gamma Rays and their interaction with Matter, Radiographic equipment, Radiographic Techniques, Safety Aspects of Industrial Radiography.

Unit 2 Ultrasonic test 8

Principle of Wave Propagation, Reflection, Refraction, Diffraction, Mode Conversion and Attenuation, Sound Field, Piezo-electric Effect , Ultrasonic Transducers and their Characteristics, Ultrasonic Equipment and Variables Affecting Ultrasonic Test, Ultrasonic Testing, Interpretations and Guidelines for Acceptance, Rejection - Effectiveness and Limitations of Ultrasonic Testing.

Unit 3 Liquid penetrant, Eddy Current & Magnetic Particle Test 8

Liquid Penetrant Test: Liquid Penetrant Test, Basic Concepts, Liquid Penetrant System, Test Procedure, Effectiveness and Limitations of Liquid Penetrant Testing.

Eddy Current Test: Principle of Eddy Current, Eddy Current Test System, Applications of Eddy Current-Testing Effectiveness of Eddy Current Testing.

Magnetic Particle Test: Magnetic Materials, Magnetization of Materials, Demagnetization of Materials, Principle of Magnetic Particle Test, Magnetic Particle Test Equipment, Magnetic Particle Test Procedure, Standardization and Calibration, Interpretation and Evaluation, Effective Applications and Limitations of the Magnetic Particle Test. Natural Frequency Test

8

Unit 4 Infrared & Thermal Testing

Infrared And Thermal Testing: Introduction and fundamentals to infrared and thermal testing–Heat transfer –Active and passive techniques –Lock in and pulse thermography– Contact and non-contact thermal inspection methods–Heat sensitive paints –Heat sensitive papers —thermally quenched phosphors liquid crystals –techniques for applying liquid crystals –other temperature sensitive coatings –Inspection methods –Infrared radiation and infrared detectors– thermo mechanical behavior of materials–IR imaging in aerospace applications, electronic components, Honey comb and sandwich structures–Case studies.

8

Unit 5 Industrial Applications of NDE

Industrial Applications of NDE: Span of NDE Activities Railways, Nuclear, Non-nuclear and Chemical Industries, Aircraft and Aerospace Industries, Automotive Industries, Offshore Gas and Petroleum Projects, Coal Mining Industry, NDE of pressure vessels, castings, welded constructions.

Prescribed Textbooks:

1. J Prasad, GCK Nair ,Nondestructive test and evaluation of Materials, Tata Mcgraw
2. Josef Krautkrämer, Herbert Krautkrämer, Ultrasonic testing of materials, 3/e, Springer

Reference Books:

1. Gary L. Workman, Patrick O. Moore, Doron Kishoni, Non-destructive, Hand Book, Ultrasonic Testing, 3/e, Amer Society for Nondestructive, 2007.
2. ASTM Standards, Vol 3.01, Metals and alloys.
3. X.P.V.Maldague, Nondestructive evaluation of materials by infrared thermography, 1/e, Springer- Verlag, 1993.
4. I. J. Khan, *Non-Destructive Testing*, S. K. Kataria & Sons Publishers, New Delhi.

Online Learning Resources:

- http://www.twivirtualacademy.com/online-courses/ndt
- https://www.classcentral.com/course/swayam-theory-and-practice-of-non-destructive- testing-9872
- https://onlinecourses.nptel.ac.in/noc20_mm07/preview
- https://www.youtube.com/watch?v=dyMR58TZMbo
- https://www.youtube.com/watch?v=Wam-Ewcn3aQ
- https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_NDT_LECTURE_NOTES.pdf
- https://lecturenotes.in/subject/390/non-destructive-testing

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037AT.1	2	2	2	2	-	-	-	-	-	-	-	2	2
23A037AT.2	2	2	2	2	-	-	-	-	-	-	-	2	2
23A037AT.3	3	3	3	3	-	-	-	-	-	-	-	1	1
23A037AT.4	3	3	3	3	-	-	-	-	-	-	-	2	2
23A037AT.5	3	3	3	3	-	-	-	-	-	-	-	2	2

(G. Aruna Rao) (Dr. N. Kishore Kumar) (Ramadevi Pasupuleti)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	**Finite Element Methods**
Category:	PE
Couse Code:	23A037BT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Learn basic principles of finite element analysis procedure.
2. To Gain knowledge of the concepts of Nodes and elements.
3. To Know the theory and characteristics of finite elements that represent engineering structures.
4. To Apply finite element solutions to structural, thermal, and dynamic problems.
5. To Develop the knowledge and skills to evaluate finite element analyses and apply design analysis effectively.

Course Outcomes:

At the end of the course, the student will be able to

1. Identify mathematical models to solve common engineering problems by applying the finite element method and able to solve one dimensional problem like bars.
2. Derive element matrices to find stresses in beams and truss problems.
3. Analyze the plain stress, plain strain and axis-symmetric problems by formulating FE characteristic equations for two dimensional elements.
4. Analyze the Curved boundary elements using Iso-parametric elements & heat transfer problems by formulating the FE characteristic equations.
5. Identify how the finite element method expands beyond the structural domain, for problems involving dynamics and Torsion problems.

Unit 1 Introduction to finite element methods 15

Introduction to FEM: Introduction to finite element methods for solving field problems, applications, Stress and equilibrium, Boundary conditions, Strain-Displacement relations, Stress- strain relations for 2D and 3D Elastic problems: Potential energy and equilibrium, Rayleigh-Ritz method, Formulation of Finite Element Equations.

One-dimensional Problems: Finite element modelling of ID bar elements coordinates and shape functions. Requirements for Convergence and Interpolation functions, Pascal's Triangle, Assembly of global stiffness matrix and load vector. Finite element equations, Treatment of boundary conditions, Quadratic shape functions.

Unit 2 1D Analysis of Trusses and Beam 08

Analysis of trusses: Stiffness Matrix for 1D truss element, Stress Calculations and Problems with maximum of three elements.

Analysis of beams: Element Stiffness Matrix and Load vector for 1 D beam element, Hermite shape functions and simple problems.

Unit 3 2D Analysis 08

Finite element modeling of two dimensional stress analysis with constant strain triangles and treatment of boundary conditions. Estimation of load Vector, Stresses.

Finite element modeling of axi-symmetric solids subjected to axi-symmetric loading with triangular elements.

09

Unit 4 Quadrilateral Elements & Thermal Analysis

Quadrilateral Elements: Isoparametric, Sub parametric and Super parametric elements, Modelling of 4 noded and 8 noded quadrilateral elements and simple problems. Numerical Integration.
Steady state heat transfer analysis: One dimensional analysis of composite slab and fin.

10

Unit 5 Dynamic analysis

Dynamic analysis: Analysis of a 1D uniform shaft subjected to torsion – Simple problems
Dynamic analysis: Formulation of finite element model, element – mass matrices, evaluation of Eigen values and Eigen vectors for a bar and shaft.

Textbooks:

1. T. R. Chandrupatla and Ashok D. Belegundu, *Introduction to Finite Elements in Engineering*, 4th Edition, Pearson Publications, 2011.
2. J. N. Reddy, *An Introduction to the Finite Element Method*, McGraw-Hill, New York, 1993.

Reference Books:

1. S. S. Rao, *The Finite Element Method in Engineering*, 2nd Edition, Elsevier Butterworth-Heinemann, 2011.
2. K. J. Bathe, *Finite Element Procedures in Engineering Analysis*, Prentice-Hall, Englewood Cliffs, 1982.
3. O. C. Zienkiewicz and R. L. Taylor, *The Finite Element Method*, 3rd Edition, McGraw-Hill, 1989.
4. G. Lakshmi Narasaiah, *Finite Element Analysis*, 1st Edition, B.S. Publications, 2008.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037BT.1	3	3	3	3	-	-	-	1	-	-	-	2	2	3
23A037BT.2	3	3	3	3	-	-	-	1	-	-	-	1	3	2
23A037BT.3	3	3	3	3	-	-	-	1	-	-	-	-	2	2
23A037BT.4	3	3	3	3	-	-	-	1	-	-	-	-	1	1
23A037BT.5	3	3	3	3	-	-	-	1	-	-	-	-	2	2

(G. Aravind)

(Dr. Kishore Kesavulu N)

(Ramesh Kesavulu C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Non-Conventional Energy Sources
Category:	PE
Couse Code:	23A037CT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To grasp the role and potential of new and renewable source
2. To Provide on insight the types and working principles of solar energy collectors.
3. To Gain Knowledge as of solar energy storage and Wind Energy.
4. To Familiarize the concepts of Biomass & Geothermal energy.
5. To Conversant with Ocean energy and direct energy conversion.

Course Outcomes:

At the end of the course, the student will be able to

1. Summarize the basics of solar radiation and its instruments.
2. Summarize the types of solar collectors and their applications.
3. Summarize the types of energy storage systems and working of wind mills and their applications.
4. Summarize the concepts of Bio-Mass energy and Geothermal resources.
5. Summarize the concepts of Ocean thermal energy conversion plants, wave energy, tidal energy and different direct energy conversion systems.

Unit 1 Principles of Solar Radiation 09

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant; extra-terrestrial and terrestrial solar radiation, solar radiation on titled surface, Instruments for measuring solar radiation and sun shine, solar radiation data.

Unit 2 Solar Energy Collection 09

Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

Unit 3 Solar Energy Storage and Applications & Wind Energy 09

Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria

Unit 4 Bio-Mass & Geo-Thermal Energy 09

Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects.

GEOTHERMAL ENERGY: Resources, types of wells, methods of harnessing the energy, potential in India.

Unit 5 Ocean Energy & Direct Energy Conversion 10

OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, limitations, and principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule Thomson effects, Figure of merit, materials, applications,

MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

Textbooks:

1. G. D. Rai, *Non-Conventional Energy Sources*, Khanna Publishers, New Delhi, ISBN-10: 8174090738 (ISBN-13: 9788174090737)
2. Anjaneyulu Yerramilli and Francis Tuluri, *Energy Resources, Utilization and Technologies*, BS Publications, 2012, ISBN-10: 0415621135.

Reference Books:

1. John Twidell and Tony Weir, *Renewable Energy Resources*, 3rd Edition, Routledge, 2015.
2. B. H. Khan, *Non-Conventional Energy Resources*, McGraw-Hill Education, 2015
3. Frank Kreith and John F. Kreider, *Principles of Solar Energy*, Hemisphere Publishing Corporation.
4. Richard Stone and Jeffrey K. Ball, *Automotive Engineering Fundamentals*, SAE International, 2004.
5. Ashok V. Desai, *Non-Conventional Energy*, Wiley Eastern Limited.

Online Learning Resources:

- https://youtube.com/playlist?list=PL3QMEfkolRFbGhXveCE7RFDBgY0_gRxkh&si=ZYwAnUNtmIwsIq
- https://youtube.com/playlist?list=PLfxYQ3zfSrafm79OhjA7hvdCgm29EKrcq&si=wBQZsw0JtePVc2f-
- https://youtube.com/playlist?list=PLcWcvGXrBFeRV7f9oyuuX9RabYUuanGrK&si=TVHISydk9cPw5MsV

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037CT.1	2	2	1	2	-	-	-	-	-	-	-	1	2	1
23A037CT.2	2	2	1	2	-	-	-	1	-	-	-	1	1	1
23A037CT.3	2	2	1	2	-	-	-	1	-	-	-	1	2	1
23A037CT.4	2	2	1	2	-	-	-	1	-	-	-	1	1	1
23A037CT.5	2	2	1	2	-	-	-	1	-	-	-	1	2	1

(G. Amarnath) (CDR. Kishore Kumar N) (Ravi Jayapalan. C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Mechatronics and Mems
Category:	PE
Couse Code:	23A037DT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:
1. To Introduce the concept of mechatronics and its significance in modern industrial applications
2. To Explain the working principles, characteristics, and selection of various types of sensors.
3. To Describe different actuator systems and their integration in automation circuits.
4. To Develop understanding of microprocessors, microcontrollers, and PLCs including programming and control logic.
5. To Explore MEMS technologies, fabrication techniques, and their applications in miniaturized systems.

Course Outcomes:
At the end of the course, the student will be able to
1. Define and explain the fundamental concepts and applications of mechatronics in industrial systems
2. Identify and analyze various types of sensors and their performance characteristics for specific applications.
3. Design and evaluate actuator systems including hydraulic and pneumatic circuits for automation tasks
4. Describe and develop PLC ladder logic programs for industrial automation using sequencing, timers, counters, and analog I/O.
5. Describe MEMS fabrication methods, apply and analyze the effect of scaling in micro electromechanical system

Unit 1 Introduction 09

Definition of Mechatronics, Need for Mechatronics in Industry, Objectives of mechatronics, mechatronics design process, Mechatronics key elements, mechatronics applications – Computer numerical control (CNC) machines, Tool monitoring systems, Flexible manufacturing system (FMS), Industrial Robots, Automatic packaging systems, Automatic inspection systems.

Unit 2 Sensors 08

Static and dynamic characteristics of sensors, Displacement, Position and Proximity sensors, Force and torque sensors, Pressure sensors, Flow sensors, Temperature sensors, Acceleration sensors, Level sensors, Light sensors, Smart material sensors, Micro and Nano sensors, Selection criteria for sensors.

Unit 3 Actuators 08

Mechanical, Electrical, Hydraulic and Pneumatic Actuation systems, Characteristics and their limitations, Design of Hydraulic and Pneumatic circuits, Piezoelectric actuators, Shape memory alloys, Selection criteria for actuators.

Unit 4 Microprocessors, Microcontrollers and Programmable Logic Controllers 09

Architecture of Microprocessor, Microcontroller and Programmable Logic Controller, PLC Programming using ladder diagrams, logics, latching, sequencing, timer's relays and counters, data handling, Analog input/output, selection of controllers.

Unit 5 Micro Electro Mechanical Systems (MEMS) 08

Introduction, Integrated circuits, MEMS, History, Effect of scaling, Fabrication Techniques: Oxidation, Physical Vapor disposition, Chemical Vapor Deposition, Lithography, Etching, Wafer bonding, LIGA, DRIE, Applications: Lab on chip

Case Studies (Integrated Mechatronic Systems):

- CNC Machine Tool Monitoring System
- Industrial Robotic Manipulator
- Automated Packaging System
- Automotive Anti-lock Braking System (ABS)
- Smart Manufacturing/Industry 4.0 System using Sensors and PLC
- MEMS-based Accelerometer in Automotive Airbag Systems

Textbooks:

1. W. Bolton, *Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering*, 7th Edition, Pearson Education, 2023, ISBN-13: 978-9357052849.
2. Devdas Shetty and Richard A. Kolk, *Mechatronics System Design*, 2nd Edition, Cengage Learning, 2010, ISBN: 9788131518281.

Reference Books:

1. N. P. Mahalik, *MEMS*, 1st Edition, McGraw Hill Education, 2017, ISBN-10: 125908274X, ISBN-13: 9781259082740
2. Clarence W. de Silva, *Mechatronics: An Integrated Approach*, 1st Edition, CRC Press, 2004, ISBN-13: 9780849312748
3. James J. Allen, *Micro Electro Mechanical Systems Design*, 1st Edition, CRC Press, Taylor & Francis Group, 2005, ISBN-13: 9780429116865
4. Ganesh S. Hegde, *Mechatronics*, 1st Edition, Jones & Bartlett Learning, 2010, ISBN-13: 9781934015202
5. Mohamed Gad-el-Hak, *MEMS: Design and Fabrication*, 1st Edition, CRC Press, 2010, ISBN-13: 9780429125461

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc22_me54/preview
- https://nptel.ac.in/courses/112108092
- https://nptel.ac.in/courses/112101304
- https://onlinecourses.nptel.ac.in/noc20_ee56/preview
- https://www.cet.edu.in/noticefiles/259_Lecturer%20Note%20on%20Mechatronics-ilovepdf-compressed.pdf

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037DT.1	3	2	2	1	2	-	-	-	-	-	-	2	3	2
23A037DT.2	3	3	2	2	2	-	-	-	-	-	-	2	3	2
23A037DT.3	3	3	3	2	3	-	-	-	1	-	1	2	3	3
23A037DT.4	3	2	3	2	3	-	-	-	1	2	2	2	3	3
23A037DT.5	3	2	2	2	3	-	1	-	-	-	-	3	3	2

(G. Amarnath) CDS-N.Krishore (Convener) (Ramachandrudu.C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Applications of Computational Fluid Dynamics
Category:	PE
Couse Code:	23A037ET
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Familiarize with numerical techniques, and finite element methods for solving partial differential equations under various boundary conditions.
2. To Conversant of numerical methods for solving time-dependent partial differential equations, with emphasis on stability and accuracy analysis.
3. To Familiarize about numerical formulations for incompressible and compressible viscous flows using finite difference and advanced computational techniques.
4. To Provide Knowledge of finite volume method using finite difference formulations for solving two- and three-dimensional fluid flow and heat transfer problems.
5. To Impart knowledge of the concepts of linear fluid flow problems, steady state problems and transient problems.

Course Outcomes:

At the end of the course, the student will be able to

1. Solve partial differential equations using finite element methods.
2. Analyze explicit and implicit numerical schemes to solve nonlinear and second-order PDEs, using appropriate numerical techniques.
3. Solve incompressible and compressible viscous flow problems with appropriate boundary conditions.
4. Develop finite volume formulations based on finite difference methods, ensuring accurate and conservative solutions in CFD applications.
5. Analyze linear fluid flow problems, using appropriate numerical methods.

Unit 1 Introduction and Solution methods **12**

Introduction: Finite difference method, finite volume method, finite element method, governing equations and boundary conditions, Derivation of finite difference equations. Solution methods: Solution methods of elliptical equations — finite difference formulations, Interactive solution methods, direct method with Gaussian elimination. Parabolic equations-explicit schemes and Von Neumann stability analysis, Implicit schemes, alternating direction implicit schemes, approximate factorization, fractional step methods, direct method with tridiagonal matrix algorithm.

Unit 2 Hyperbolic equations **10**

Hyperbolic equations: Explicit schemes and Von Neumann stability analysis, Implicit schemes, multi-step methods, nonlinear problems, second order one-dimensional wave equations. Burgers equations: Explicit and implicit schemes, Runge-Kutta method.

Unit 3 Formulations Of Incompressible Viscous Flows **10**

Formulations of incompressible viscous flows by finite difference methods, pressure correction methods, vortex methods. Treatment of compressible flows: potential equation, Euler equations, Navier-stokes system of equations, flow field-dependent variation methods, boundary conditions, example problems.

Unit 4 Finite Volume Method 08

Finite Volume Method Finite volume method via finite difference method, formulations for two and three-dimensional problems.

Unit 5 Standard Variational Methods 08

Standard Variational Methods: Linear fluid flow problems, steady state problems, Transient problems.

Textbooks:

1. T. J. Chung, *Computational Fluid Dynamics*, 2nd Edition, Cambridge University Press, 2010, ISBN-13: 978-0521769693
2. John D. Anderson Jr., *Computational Fluid Dynamics: The Basics with Applications*, McGraw-Hill Education, 2017, ISBN-13: 978-1259025969

Reference Books:

1. Frank Chorlton, *Textbook of Fluid Dynamics*, CBS Publishers & Distributors, 1985, ISBN-13: 978-8123908816.
2. Suhas V. Patankar, *Numerical Heat Transfer and Fluid Flow*, Hemisphere Publishing Corporation / McGraw-Hill, 2017, ISBN-13: 978-1138564695
3. K. Muralidhar and T. Sundararajan, *Computational Fluid Flow and Heat Transfer*, Narosa Publishing House, 2003, ISBN-13: 978-1842651728
4. Tapan K. Sengupta, *Fundamentals of Computational Fluid Dynamics*, Universities Press, 2004, ISBN-13: 978-8173714788
5. C. Pozrikidis, *Introduction to Theoretical and Computational Fluid Dynamics*, 2nd Edition, Oxford University Press, 2011, ISBN-13: 978-0199752072

Online Learning Resources:

- https://nptel.ac.in/courses/112107079
- https://www.youtube.com/watch?v=3QFT7pGx03I
- https://www.youtube.com/watch?v=t7jS7V_6TGQ
- https://nptel.ac.in/courses/112107080

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037ET.1	3	3	3	2	2	-	-	-	-	-	-	2	3	3
23A037ET.2	3	3	3	2	2	-	-	-	-	-	-	2	3	3
23A037ET.3	3	3	3	2	2	-	-	-	-	-	-	2	3	3
23A037ET.4	3	3	3	2	2	-	-	-	-	-	-	2	3	3
23A037ET.5	3	3	3	2	2	-	-	-	-	-	-	2	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Total Quality Management
Category:	PE
Couse Code:	23A037FT
Branch/es:	Mechanical Engineering
Year &Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:
1. To introduce the students, the basic concepts of Total Quality Management.
2. To expose with various quality issues in Inspection.
3. To gain Knowledge on quality control and its applications to real time.
4. To know the extent of customer satisfaction by the application of various quality concepts.
5. To understand the importance of Quality standards in Production.

Course Outcomes:
At the end of the course, the student will be able to
1. Explain definition of quality, TQM, quality planning, quality costs and techniques of quality cost.
2. Explain quality council, quality statements, characteristics of a quality leader and can apply the knowledge of Deming's 14 principle of philosophy
3. Describe customer satisfaction and his perception of quality, TQM principles like Juran Trilogy, PDSA cycle, Kaizen principles for achieving continuous process improvement
4. Explain the concept of bench marking for organizational processes, the quality function deployment, Taguchi quality loss functions, TPM concepts, seven tools of quality and the concepts of six sigma in production processes
5. Summarize the ISO 9000, ISO 14000 quality systems concept, requirements and benefits and can apply the documentation procedures of quality systems

Unit 1 Introduction 10

Introduction: Definition of Quality, Dimensions of Quality, Definition of Total quality management, Quality Planning, Quality costs – Analysis, Techniques for Quality costs, Basic concepts of Total Quality Management.

Unit 2 Historical Review 09

Quality council, Quality statements, Strategic Planning, Deming Philosophy, Barriers of TQM Implementation, Benefits of TQM, Characteristics of successful quality leader, Contributions of Gurus of TQM, Case studies.

Unit 3 TQM Principles 10

Customer Satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment teams, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure Case studies.

Unit 4 TQM Tools 10

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA, The seven tools of quality, Process capability, Concept of Six Sigma, New Seven management tools, Case studies.

09

Unit 5 Quality Systems

Need for ISO 9000 and Other Quality Systems, ISO 9000: 2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, QS 9000, ISO 14000 – Concept, Requirements and Benefits, Case Studies.

Textbooks:

1. Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield and Mary Besterfield-Sacre, *Total Quality Management*, 4th Edition, Pearson Education, 2015, ASIN: B07G1B484M.
2. Subburaj Ramasamy, *Total Quality Management*, Tata McGraw-Hill Publishing Company Ltd., 2005, ISBN: 1259001415.

Reference Books:

1. V. Narayanan and N. S. Sreenivasan, *Quality Management: Concepts and Tasks*, New Age International Publishers, 1996, ISBN-10: 9395161620.
2. Eugene L. Grant and Richard S. Leavenworth, *Statistical Quality Control*, 7th Edition, Tata McGraw-Hill, 2015, ISBN: 0070435553
3. Samuel K. Ho, *TQM: An Integrated Approach*, Kogan Page Ltd., USA, 1995.

Online Learning Resources:

- https://www.youtube.com/watch?v=VD6tXadibk0
- https://www.investopedia.com/terms/t/total-quality-management-tqm.asp
- https://onlinecourses.nptel.ac.in/noc21_mg03/preview
- https://nptel.ac.in/courses/110/104/110104085/
- https://nptel.ac.in/noc/courses/noc18/SEM2/noc18-mg39/

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037FT.1	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037FT.2	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037FT.3	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037FT.4	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037FT.5	2	2	1	1	-	-	-	-	-	-	-	-	1	2

(G. Amarnath)

(Dr. Ikishore Kumar. N)

(Parameshwaran. C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Mechanical Vibrations
Category:	PE
Course Code:	23A037GT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Introduce fundamental concepts of vibration analysis, focusing on Single Degree Freedom (SDOF) systems and their solutions.
2. To Develop understanding of forced vibration, resonance, and damping effects in Single Degree Freedom systems, including vibration isolation.
3. To Explore the dynamics of Two Degree Freedom (2DOF) systems and their application in vibration absorbers and coupled systems.
4. To Familiarize Multi Degree Freedom (MDOF) systems, methods for formulating equations of motion, and vibration analysis techniques.
5. To Explain vibration measurement tools, transducers, and exciters used in experimental vibration analysis.

Course Outcomes:

At the end of the course, the student will be able to

1. Define, Understand and Solve problems related to undamped and damped free vibrations in Single Degree Freedom systems using classical and energy methods.
2. Analyze forced vibrations in Single Degree Freedom systems under various excitation forces, apply and evaluate the concepts of transmissibility and isolation.
3. Derive the equations of motion, calculate natural frequencies, modes of vibration, and understand their application in dynamic vibration absorbers.
4. Formulate equations of motion, and perform modal analysis of free and forced vibrations. Apply vibration measurement tools to select appropriate exciters for vibration testing.
5. Explain and evaluate the damping characteristics in vibrating systems, including the effects of viscous damping, Coulomb damping, and damping in whirling of shafts.

Unit 1 Single Degree Freedom Systems 10

Single Degree Freedom Systems: Un-damped free vibration: Classical method, Energy method, equivalent systems, torsional systems. Damped free vibration- Viscous damping, under damping, critical damping, over damping. Coulomb damping, equivalent damping coefficient. Simple problems.
Whirling of shafts: Transverse vibrations: Dunkerley's lower bound approximation, Critical speed of shafts.

Unit 2 Forced vibrations of Single Degree Freedom Systems 10

Steady state forced vibration, sources of excitation, impressed harmonic force, resonance impressed force due to unbalance, motion excitation, transmissibility and isolation, performance of different type of isolators, power absorbed by viscous damping.

Unit 3 Two Degree Freedom Systems 09

Two Degree Freedom Systems: Formulation of Equation of motion, Natural frequencies and modes of vibration by classical method, coupled pendulum, forced vibration, dynamic vibration absorber.

Unit 4 Multi Degree Freedom Systems 09

Lagrangian method for formulation of equation of motion Influence co- efficient method, Lumped mass and distributed mass systems, Stodola method, Holzer's method, model analysis of free and forced vibrations.

Unit 5 Vibration measurement and Applications 10

Transducers: variable resistance transducers, Piezoelectric transducers, electro dynamic transducers and linear variable differential transformer transducer; Vibration pickups: vibrometer, accelerometer, velometer and phase distortion; Frequency-measuring instruments; Vibration exciters- Mechanical exciters and electro dynamic shaker.

Prescribed Textbooks:

1. Singiresu S. Rao, *Mechanical Vibrations*, 6th Edition, Pearson Education, 2018.
2. G. K. Grover, *Mechanical Vibrations*, 8th Edition, Nem Chand & Bros., 2009.

Reference Books:

1. Leonard Meirovitch, *Elements of Vibration Analysis*, Tata McGraw-Hill, 1986.
2. S. Graham Kelly, *Mechanical Vibrations*, Tata McGraw-Hill, 1996.
3. William T. Thomson and Marie Dillon Dahleh, *Theory of Vibration with Applications*, 5th Edition, Pearson Education, 2008.
4. William Weaver Jr., Stephen P. Timoshenko and Don H. Young, *Vibration Problems in Engineering*, 5th Edition, John Wiley & Sons, 2013.
5. C. Nataraj, *Vibration of Mechanical Systems*, 1st Edition, Cengage Learning, 2012.

Online Learning Resources:

- https://nptel.ac.in/courses/112107212
- https://nptel.ac.in/courses/112103111
- https://nptel.ac.in/courses/112103112
- https://nptel.ac.in/courses/101105081
- https://www.iare.ac.in/sites/default/files/PPT/MVSD%20PPT.pdf
- https://www.iare.ac.in/sites/default/files/lecture_notes/MV_LECTURE_NOTES.pdf

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037GT.1	3	3	2	2	-	-	-	1	-	1	-	1	2	3
23A037GT.2	2	3	2	2	-	-	-	1	-	1	-	1	3	3
23A037GT.3	3	3	2	2	-	-	-	1	-	1	-	1	3	3
23A037GT.4	2	3	2	3	-	-	-	1	-	1	-	1	2	3
23A037GT.5	3	2	2	2	-	-	-	1	-	1	-	1	3	3

(Gr Amarnath) (COE-N. Kishore Kumar)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	**Refrigeration & Air Conditioning**
Category:	PE
Couse Code:	23A037HT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Conversant with the fundamental concepts and laws of refrigeration systems including Carnot and air-based cycles.
2. To Familiarize with the working principles, components, and performance parameters of vapour compression refrigeration systems.
3. To Gain Knowledge of alternative refrigeration systems such as vapour absorption, steam jet, thermoelectric, and vortex refrigeration.
4. To Provide an insight of psychrometric processes and air conditioning load calculations.
5. To Familiarize with air conditioning components and the concept of human thermal comfort and heat pumps.

Course Outcomes:

At the end of the course, the student will be able to

1. Apply the principles of refrigeration for different refrigeration methods.
2. Analyze the working of Vapour Compression Refrigeration system and the effects of sub cooling, superheating on its performance.
3. Summarize the operation of various Vapor Absorption and Steam Jet Refrigeration Systems.
4. Analyze psychometric processes under various heat loads for different air conditioning systems.
5. Summarize the working of air conditioning equipment and configurations of heat pump circuits.

Unit 1 Introduction to Refrigeration 10

Introduction to Refrigeration Necessity and Applications, Carnot Refrigerator, First and Second Law Applied to Refrigerating Machines, Unit of Refrigeration, COP, EER, Different Refrigeration Methods. Air Refrigeration: Bell-Coleman Cycle, Ideal and Actual Cycles, Open and Dense Air Systems - Numerical Problems - Refrigeration Needs of Air Crafts.

Unit 2 Vapour Compression Refrigeration (VCR) System 10

Vapour Compression Refrigeration (VCR) System - Basic Cycle - Working Principle and Essential Components of the Plant - COP - Representation of Cycle On T-S and P-h Charts - Expander Vs. Throttling, Effect of Sub Cooling and Super Heating - Cycle Analysis – Actual Cycle- Influence of Various Parameters on System Performance - Construction and Use of P-h Charts - Numerical Problems. Refrigerants - Desirable Properties - Classification of Refrigerants Used - Nomenclature- Secondary Refrigerants- Lubricants - Ozone Depletion - Global Warming- Newer Refrigerants.

Unit 3 Vapor Absorption Refrigeration (VAR) System & Steam Jet Regrigeration System 08

Vapor Absorption Refrigeration (VAR) System-Description and Working of NH3 - Water System and Li Br - Water (Two Shell & Four Shell) System -Calculation of Max COP, Principle of Operation of Three Fluid Absorption System

STEAM JET REFRIGERATION SYSTEM: Working Principle and Basic Components-Estimation of Motive Steam Required Principle and Operation of: (I) Thermo-Electric Refrigerator (II) Vortex Tube or Hilsch Tube.

Unit 4 Introduction to Air Conditioning: 10

Psychrometric Properties & Processes - Characterization of Sensible and Latent Heat Loads - Need for Ventilation, Consideration of Infiltrated Air - Heat Load Concepts. Air Cooler (Evaporative Cooling), Window, Split, Summer, Winter, Year-Round, Central Air Conditioning Systems.

Unit 5 Air Conditioning Equipment 10

Air Conditioning Equipment - Humidifiers - Dehumidifiers - Air Filters, Fans and Blowers. Human Comfort: Requirements of Temperature, Humidity and Concept of Effective Temperature, Comfort Chart. Heat Pump - Heat Sources - Different Heat Pump Circuits. Energy efficient AC system Star Rating.

Textbooks:

1. C. P. Arora, *Refrigeration and Air Conditioning*, 4th Edition, McGraw Hill Education, 2021, ISBN-13: 978-9390385843
2. R. S. Khurmi and J. K. Gupta, *A Textbook of Refrigeration and Air Conditioning*, S. Chand Publishing, 2020, ISBN-13: 978-8121927819.

Reference Books:

1. Manohar Prasad, *Refrigeration and Air Conditioning*, 3rd Edition, New Age International Publishers, 2021, ISBN-13: 978-8122436945.
2. Roy J. Dossat and Thomas J. Horan, *Principles of Refrigeration*, 4th Edition, Pearson Education, 2007, ISBN-13: 978-8177588811.
3. P. L. Ballaney, *Refrigeration and Air Conditioning*, 3rd Edition, Khanna Publishers, 2025, ISBN-13: 978-8174091369.
4. P. N. Ananthanarayanan, *Basic Refrigeration and Air Conditioning*, 4th Edition, Tata McGraw-Hill (TMH), 2013, ISBN-13: 978-1259062704.
5. S. C. Arora and Domkundwar, *A Course in Refrigeration and Air Conditioning*, 12th Edition, Dhanpat Rai Publications, 2012, ISBN: 9788177000009.

Online Learning Resources:

- https://archive.nptel.ac.in/courses/112/105/112105128/
- https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_RAC_Lecture_Notes.pdf
- https://www.studocu.com/en-us/document/saint-louis-university/fluid-dynamics-laboratory/refrigeration-lecture-notes-1/3020577
- https://nptel.ac.in/courses/112105129
- http://dte.karnataka.gov.in/Institutes/gptkampli/GenericDocHandler/68-fc177b7d-f5d1-4580-b577-b1118df994f4.pdf

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037HT.1	3	3	2	-	-	-	-	-	-	-	-	1	2	2
23A037HT.2	3	3	2	2	-	-	-	-	-	-	-	1	3	2
23A037HT.3	3	-	-	-	-	-	-	-	-	-	-	-	1	1
23A037HT.4	3	3	3	2	-	-	-	-	-	-	-	1	2	3
23A037HT.5	3	-	-	-	-	-	-	-	-	-	-	-	1	1

G. Amarnath

Dr. Ishwar Kumar N

Dr. Ramanjaneyulu C

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	**Automation & Robotics**
Category:	PE
Couse Code:	23A037IT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To acquire basic knowledge on automation and hardware components of automation.
2. To learn about the automated flow lines, line balancing methods and automated assembly systems.
3. To learn about the robotics and fundamentals of robots with their needs in present trend and the sensors, actuators.
4. To understand robot kinematics, dynamics and to acquire knowledge on importance of trajectory planning in robots.
5. To learn about the robot programming methods and applications of industrial robots.

Course Outcomes:

At the end of the course, the student will be able to

1. Summarize the concepts of an automation and hardware components of automation
2. Analyze the line balancing methods and automated assembly systems, automated flow lines.
3. Summarize the fundamentals of Robots, sensors and actuators.
4. Analyze the Robot kinematics, dynamics and trajectory planning
5. Summarize the concept of robot programming methods and robot applications

Unit 1 Introduction to Automation **12**

Introduction to Automation, Need, Types, Basic elements of an automated system, Manufacturing Industries, Types of production, Functions in manufacturing, Organization and information processing in manufacturing, Automation strategies and levels of automation, Hardware components for automation and process control, mechanical feeders, hoppers, orienters, high speed automatic insertion devices.

Unit 2 Automated Flow Lines and Assembly line balancing **12**

Automated flow lines, Part transfer methods and mechanisms, types of Flow lines, flow line with/without buffer storage, Quantitative analysis of flow lines. Assembly line balancing: Assembly process and systems assembly line, line balancing methods, ways of improving line balance, flexible assembly lines.

Unit 3 Introduction to Industrial Robotics, actuators and Feedback components **12**

Introduction to Industrial Robotics: Introduction to Industrial Robotics, Classification of Robot Configurations, functional line diagram, degrees of freedom. Components common types of arms, joints grippers, factors to be considered in the design of grippers.

Robot actuators and Feedback components: Actuators, Pneumatic, Hydraulic actuators, Electric & Stepper motors, comparison. Position sensors - potentiometers, resolvers, encoders - velocity sensors, Tactile sensors, Proximity sensors.

Unit 4 Manipulator Kinematics, Manipulator Dynamics and Trajectory Planning **12**

Manipulator Kinematics: Homogenous transformations as applicable to rotation and transition - D-H notation, forward inverse kinematics.

Manipulator Dynamics: Differential transformations, Jacobians, Lagrange - Euler and Newton – Euler formations.

Trajectory Planning: Trajectory Planning and avoidance of obstacles path planning, skew motion, joint integrated motion - straight line motion.

Unit 5 Robot Programming and Robot Application in Manufacturing 10

Robot Programming: Methods of programming - requirements and features of programming languages, software packages. Problems with programming languages.

Robot Application in Manufacturing: Material Transfer - Material handling, loading and unloading - Process - spot and continuous arc welding & spray painting - Assembly and In

Textbooks:

1. Mikell P. Groover, *Automation, Production Systems, and Computer-Integrated Manufacturing*, Pearson Education, 2004, ISBN-10: 9789332572492, ISBN-13: 978-9332572492.
2. Saeed B. Niku, *Introduction to Robotics: Analysis, Systems, Applications*, Prentice Hall of India (PHI), New Delhi, ISBN-10: 0130613096.

Reference Books:

1. K. S. Fu, R. C. Gonzalez and C. S. G. Lee, *Robotics: Control, Sensing, Vision, and Intelligence*, McGraw-Hill Education, 2014, ISBN: 9780071822282.
2. Subir Kumar Saha, *Introduction to Robotics*, 2nd Edition, McGraw-Hill Education, 2014, ISBN: 9789332902800.
3. Mikell P. Groover, Mitchell Weiss, Roger N. Nagel and Nicholas G. Odrey, *Industrial Robotics: Technology, Programming and Applications*, Tata McGraw-Hill (TMH), 2003, ISBN-10: 007024989X.
4. John J. Craig, *Introduction to Robotics: Mechanics and Control*, Pearson Education, 2017, ISBN: 0133489795.

Online Learning Resources:

- https://youtu.be/oxMdDsud5vg
- https://www.youtube.com/watch?v=xrwz9IxpMJg&t=1311

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037IT.1	3	2	1	1	-	-	-	-	-	-	-	3	1	1
23A037IT.2	3	3	2	2	-	-	-	-	-	-	-	3	2	2
23A037IT.3	3	2	1	1	-	-	-	-	-	-	-	3	1	1
23A037IT.4	3	3	2	2	-	-	-	-	-	-	-	3	2	2
23A037IT.5	3	2	1	1	-	-	-	-	-	-	-	3	1	1

(G. Amarnath)

(Dr. Krishore Kumar P)

(Praveen Kumar C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Smart Manufacturing
Category:	PE
Couse Code:	23A037JT
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Understand the fundamental concepts of Smart Manufacturing, Industry 4.0 and IoT in Manufacturing.
2. To Understand the fundamental concepts of Data Analytics and Artificial Intelligence in Manufacturing.
3. To Know about Smart Sensors, RFID, and Block chain in Manufacturing.
4. To Explain the techniques of Digital Twin & Simulation in Manufacturing.
5. To Familliarize Sustainable and Green Manufacturing.

Course Outcomes:

At the end of the course, the student will be able to

1. Define and explain the evolution of Smart Manufacturing, Industry 4.0 and IoT in Manufacturing.
2. Concepts of Data Analytics and Artificial Intelligence in Manufacturing.
3. Apply knowledge of Smart Sensors, RFID, and Block chain in Manufacturing.
4. Summarize the techniques of Digital Twin & Simulation in Manufacturing.
5. Importance of Sustainable and Green Manufacturing.

Unit 1 08

Definition, Evolution, and Importance of Smart Manufacturing, Industry 4.0 and Its Impact on Manufacturing, Traditional Vs. Smart Manufacturing, Key Technologies in Smart Manufacturing.

Cyber-Physical Systems & Industrial IoT (IIoT)

Basics of Cyber-Physical Systems (CPS), Internet of Things (IoT) in Manufacturing, Smart Sensors and Actuators Communication Protocols (MQTT, OPC-UA, Modbus),

Unit 2 08

Data Analytics and Artificial Intelligence in Manufacturing

Role of Big Data in Manufacturing, Machine Learning & Deep Learning for Smart Manufacturing, Predictive Maintenance and Anomaly Detection, Condition Monitoring Techniques, Vibration Analysis and Natural Frequency Testing (NFT) for Machine Health Assessment, Digital Twin Technology

Automation & Robotics in Smart Manufacturing

Industrial Automation: PLCs, SCADA, and DCS, Autonomous Robots and Cobots (Collaborative Robots), Additive Manufacturing (3D Printing), Case Studies of Smart Factories.

Unit 3 07

Cloud Computing and Edge Computing in Manufacturing

Introduction to Cloud Computing for Manufacturing, Edge and Fog Computing in Real-time Manufacturing Systems, Cloud-based Manufacturing Execution Systems (MES)

Smart Sensors, RFID, and Block chain in Manufacturing

Role of Smart Sensors and RFID in Inventory Management, Blockchain for Secure Supply Chains Smart Contracts and Decentralized Manufacturing Systems

Unit 4 09

Digital Twin & Simulation in Manufacturing : Digital Twin Technology and Virtual Prototyping, Simulation

Software for Smart Manufacturing, Augmented Reality (AR) and Virtual Reality (VR) in Industry 4.0
Cybersecurity in Smart Manufacturing: Threats and Risks in Smart Manufacturing, Cybersecurity Frameworks for Industrial Systems, Best Practices for Securing IoT and IIoT Devices

08

Unit 5

Sustainable and Green Manufacturing: Energy Efficiency in Smart Manufacturing, Sustainable Supply Chain Management, Role of AI in Green Manufacturing

Case Studies and Future Trends : Case Studies of Leading Smart Manufacturing Companies, Emerging Technologies in Smart Manufacturing, Future of Industry 5.0 and Beyond

Prescribed Textbooks:

1. J. Paulo Davim (Ed.), *Green Manufacturing Processes and Systems*, Springer, 2013.
2. Kamalakar Mutalik, *Smart Manufacturing*, The Write Order Publications, 2023.

Reference Books:

1. Dr. Rajkumar E., *Introduction to Smart Manufacturing and Automation*, Namya Press, New Delhi, 29 March 2024.
2. Michael Deng and Colin Koh, *Smart Manufacturing*, Kindle Edition, 2023.

Online Learning Resources:

- https://www.youtube.com/watch?v=sdgl072DJNM&pp=ygUUU01BUlQgTUFOVUZBQ1RVUklORyA%3D(2023)

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037JT.1	3	2	2	1	3	-	-	-	-	-	-	2	3	2
23A037JT.2	3	3	2	2	3	-	-	-	-	-	-	2	3	3
23A037JT.3	3	3	3	2	3	1	-	-	1	-	-	2	3	3
23A037JT.4	3	2	3	2	3	-	-	-	-	1	1	2	3	3
23A037JT.5	3	2	2	1	2	2	3	-	-	-	-	2	2	2

(Dr. Kishore Kesavan. N)

(G. Amarnath)

(Ramaraj Ganguli. C)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	Introduction to Drone Technology
Category:	SEC
Couse Code:	23A0372L
Branch/es:	Mechanical Engineering
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
0	1	2	2

Course Objectives:

1. To learn and understand the fundaments of design, fabrication and programming of drone
2. To teach technical characteristics of the Drone parts and its functions
3. To impart the knowledge of an flying and operation of drone
4. To know about the various applications of drone
5. To understand the safety risks and guidelines of fly safely

Course Outcomes:

At the end of the course, the student will be able to

1. Know about a various type of drone technology, drone fabrication and programming
2. Execute the suitable operating procedures for functioning a drone
3. Select appropriate sensors and actuators for Drones
4. Develop a drone mechanism for specific applications
5. Create the programs for various drones

Unit 1 Introduction to Drone Technology 08

Drone Concept - Vocabulary Terminology- History of drone - Types of current generation of drones based on their method of propulsion- Drone technology impact on the businesses- Drone business through entrepreneurship- Opportunities/applications for entrepreneurship and employability.

Unit 2 Drone Design, Fabrication and Programming 10

Classifications of the UAV -Overview of the main drone parts- Technical characteristics of the parts -Function of the component parts -Assembling a drone- The energy sources- Level of autonomy- Drones configurations -The methods of programming drone- Download program -Install program on computer- Running Programs- Multi rotor stabilization- Flight modes -WI-FI connection.

Unit 3 Drone Flying and Operation 07

Concept of operation for drone -Flight modes- Operate a small drone in a controlled environment- Drone controls Flight operations –management tool –Sensors-Onboard storage capacity -Removable storage devices- Linked mobile devices and applications.

Unit 4 Drone Commercial Applications 09

Choosing a drone based on the application -Drones in the insurance sector- Drones in delivering mail, parcels, and other cargo- Drones in agriculture- Drones in inspection of transmission lines and power distribution - Drones in filming and panoramic picturing.

Unit 5 Future Drones and Safety 10

The safety risks- Guidelines to fly safely -Specific aviation regulation and standardization- Drone license- Miniaturization of drones- Increasing autonomy of drones -The use of drones in swarms.

Prescribed Textbooks:

1. Daniel Tal and John Altschuld, *Drone Technology in Architecture, Engineering and Construction: A Strategic Guide to Unmanned Aerial Vehicle Operation and Implementation*, John Wiley & Sons, Inc., 2021, ISBN-13: 9781119545927.
2. Terry Kilby and Belinda Kilby, *Make: Getting Started with Drones – Build and Customize Your Own Quadcopter*, Maker Media, Inc. (Make Community, LLC), 2015, ISBN-10: 1457183307, ISBN-13: 9781457183300

Reference Books:

1. John Baichtal, *Building Your Own Drones: A Beginner's Guide to Drones, UAVs, and ROVs*, Que Publishing, 2016, ISBN-13: 978-0789755599
2. Aleš Završnik (Ed.), *Drones and Unmanned Aerial Systems: Legal and Social Implications for Security and Surveillance*, Springer, 2018, ISBN-13: 978-3319958927

Online Learning Resources:

- https://nptel.ac.in/courses/101108661
- https://www.youtube.com/watch?v=lJnuTtUFiWM

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A0372L.1	3	1	-	-	2	1	-	-	-	-	-	2	2	1
23A0372L.2	2	2	1	1	3	-	-	1	1	-	-	1	2	2
23A0372L.3	2	2	2	1	3	-	-	-	1	-	-	1	2	3
23A0372L.4	2	2	3	1	2	2	1	-	1	1	1	1	3	2
23A0372L.5	2	1	3	1	3	-	-	1	1	1	1	2	2	3

(G. Amarnath)

(Dr. Nelshore Kumar. N)

(Ramaraj Thangavelu. C)

ANNAMACHARYAINSTITUTEOFTECHNOLOGYANDSCIENCESRAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	**Total Quality Management**
Category:	OE
Couse Code:	23A037LT
Branch/es:	CE, EEE, ECE, CSE, AIDS, AIML, CSE-DS, CSE-AI
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To introduce the students, the basic concepts of Total Quality Management.
2. To expose with various quality issues in Inspection.
3. To gain Knowledge on quality control and its applications to real time.
4. To know the extent of customer satisfaction by the application of various quality concepts.
5. To understand the importance of Quality standards in Production.

Course Outcomes:

At the end of the course, the student will be able to

1. Explain definition of quality, TQM, quality planning, quality costs and techniques of quality cost.
2. Explain quality council, quality statements, characteristics of a quality leader and can apply the knowledge of Deming's 14 principle of philosophy
3. Describe customer satisfaction and his perception of quality, TQM principles like Juran Trilogy, PDSA cycle, Kaizen principles for achieving continuous process improvement
4. Explain the concept of bench marking for organizational processes, the quality function deployment, Taguchi quality loss functions, TPM concepts, seven tools of quality and the concepts of six sigma in production processes
5. Summarize the ISO 9000, ISO 14000 quality systems concept, requirements and benefits and can apply the documentation procedures of quality systems

Unit 1 Introduction **10 Hrs**

Definition of Quality, Dimensions of Quality, Definition of Total quality management, Quality Planning, Quality costs – Analysis, Techniques for Quality costs, Basic concepts of Total Quality Management.

Unit 2 Historical Review **9 Hrs**

Quality council, Quality statements, Strategic Planning, Deming Philosophy, Barriers of TQM Implementation, Benefits of TQM, Characteristics of successful quality leader, Contributions of Gurus of TQM, Case studies.

Unit 3 TQM Principles **10 Hrs**

Customer Satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment teams, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure Case studies.

Unit 4 TQM Tools **10 Hrs**

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA, The seven tools of quality, Process capability, Concept of Six Sigma, New Seven management tools, Case studies

Unit 5 Quality Systems 9 Hrs

Need for ISO 9000 and Other Quality Systems, ISO 9000: 2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, QS 9000, ISO 14000 – Concept, Requirements and Benefits, Case Studies.

Textbooks:

1. Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield and Mary Besterfield-Sacre, *Total Quality Management*, 4th Edition, Pearson Education, 2015, ASIN: B07G1B484M
2. Subburaj Ramasamy, *Total Quality Management*, Tata McGraw-Hill Publishing Company Ltd., 2005, ISBN: 1259001415

Reference Books:

1. V. Narayanan and N. S. Sreenivasan, *Quality Management: Concepts and Tasks*, New Age International Publishers, 1996, ISBN-10: 9395161620.
2. Eugene L. Grant and Richard S. Leavenworth, *Statistical Quality Control*, 7th Edition, Tata McGraw-Hill, 2015, ISBN: 0070435553
3. Samuel K. Ho, *TQM: An Integrated Approach*, Kogan Page Ltd., USA, 1995.

Online Learning Resources:

- https://www.youtube.com/watch?v=VD6tXadIbk0
- https://www.investopedia.com/terms/t/total-quality-management-tqm.asp
- https://blog.capterra.com/what-is-total-quality-management/
- https://nptel.ac.in/courses/110/104/110104080/
- https://onlinecourses.nptel.ac.in/noc21_mg03/preview
- https://nptel.ac.in/courses/110/104/110104085/
- https://nptel.ac.in/noc/courses/noc18/SEM2/noc18-mg39/

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037LT.1	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037LT.2	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037LT.3	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037LT.4	2	2	1	1	-	-	-	-	-	-	-	-	1	2
23A037LT.5	2	2	1	1	-	-	-	-	-	-	-	-	1	2

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)
Department of Mechanical Engineering

Title of the Course:	**3D Printing Technologies**
Category:	OE
Couse Code:	23A037MT
Branch/es:	CE, EEE, ECE, CSE, AIDS, AIML, CSE-DS, CSE-AI
Year & Semester:	IV Year I Semester

Lecture Hours	Tutorial Hours	Practice Hours	Credits
3	0	0	3

Course Objectives:

1. To Understand the fundamental concepts of prototyping and distinguish between traditional and rapid prototyping methods.
2. To Demonstrate the working principles, materials, and applications of solid-, liquid-, and powder-based RP systems.
3. To Define the processes and classifications of rapid tooling and reverse engineering techniques.
4. To Identify common errors in 3D printing and evaluate pre-processing, processing, and post-processing issues.
5. To Familiarize RP-related software and its role in applications such as design, manufacturing, and medical fields.

Course Outcomes:

At the end of the course, the student will be able to

1. Define and explain the evolution and need for rapid prototyping in modern product development.
2. Compare and contrast various 3D printing technologies based on working principles, materials, and limitations.
3. Apply knowledge of rapid tooling and reverse engineering techniques for industrial and design applications.
4. Diagnose and interpret different types of errors encountered in 3D printing processes and recommend solutions.
5. Use RP-specific software tools to manipulate STL files and prepare models for printing in real-world scenarios.

Unit 1 Introduction to 3D Printing 09

Introduction to Prototyping, Traditional Prototyping Vs. Rapid Prototyping (RP), Need for time compression in product development, Usage of RP parts, Generic RP process, Distinction between RP and CNC, other related technologies, Classification of RP.

Unit 2 Solid and Liquid Based RP Systems 09

Working Principle, Materials, Advantages, Limitations and Applications of Fusion Deposition Modelling (FDM), Laminated Object Manufacturing (LOM), Stereo lithography (SLA), Direct Light Projection System (DLP) and Solid Ground Curing (SGC).

Unit 3 Powder Based & Other RP Systems 09

Powder Based RP Systems: Working Principle, Materials, Advantages, Limitations and Applications of Selective Laser Sintering (SLS), Direct Metal Laser Sintering (DMLS), Laser Engineered Net Shaping (LENS) and Electron Beam Melting (EBM). Other RP Systems: Working Principle, Materials, Advantages, Limitations and Applications of Three Dimensional Printing (3DP), Ballastic Particle Manufacturing (BPM) and Shape Deposition Manufacturing (SDM).

Unit 4 Rapid Tooling & Reverse Engineering 09

Rapid Tooling: Conventional Tooling Vs. Rapid Tooling, Classification of Rapid Tooling, Direct and Indirect Tooling Methods, Soft and Hard Tooling methods. Reverse Engineering (RE): Meaning, Use, RE—The Generic Process, Phases of RE Scanning, Contact Scanners and Noncontact Scanners, Point Processing, Application Geometric Model, Development

Unit 5 Errors in 3D Printing and Applications: 09

Pre-processing, processing and post-processing errors, Part building errors in SLA, SLS, etc. Software: Need for software, MIMICS, Magics, SurgiGuide, 3-matic, 3D-Doctor, Simplant, Velocity2, VoXim, Solid View, 3DView, etc., software, Preparation of CAD models, Problems with STL files, STL file manipulation, RP data formats: SLC, CLI, RPI, LEAF, IGES, HP/GL, CT, STEP. Applications: Design, Engineering Analysis and planning applications, Rapid Tooling, Reverse Engineering, Medical Applications of RP.

Prescribed Textbooks:

1. Chee Kai Chua and Kah Fai Leong, —3D Printing and Additive Manufacturing Principles and Applications‖ 5/e, World Scientific Publications, 2017.
2. Ian Gibson, David W Rosen, Brent Stucker, —Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing‖, Springer, 2/e, 2010.

Reference Books:

1. Frank W.Liou, —Rapid Prototyping & Engineering Applications‖, CRC Press, Taylor & Francis Group, 2011.
2. Rafiq Noorani, —Rapid Prototyping: Principles and Applications in Manufacturing‖, John Wiley&Sons, 2006.

Online Learning Resources:

- NPTEL Course on Rapid Manufacturing.
- https://nptel.ac.in/courses/112/104/112104265/
- https://www.hubs.com/knowledge-base/introduction-fdm-3d-printing/
- https://slideplayer.com/slide/6927137/
- https://www.mdpi.com/2073-4360/12/6/1334
- https://www.centropiaggio.unipi.it/sites/default/files/course/material/2013-11-29%20-%20FDM.pdf
- https://lecturenotes.in/subject/197
- https://www.cet.edu.in/noticefiles/258_Lecture%20Notes%20on%20RP-ilovepdfcompressed.pdf
- https://www.vssut.ac.in/lecture_notes/lecture1517967201.pdf
- https://www.youtube.com/watch?v=NkC8TNts4B4.

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	PSO1	PSO2
23A037MT.1	3	2	3	3	2	2	1	2	-	2	3	3	3	3
23A037MT.2	3	2	3	3	3	2	1	2	-	2	2	3	3	3
23A037MT.3	3	2	3	3	3	2	1	2	-	2	2	3	3	3
23A037MT.4	3	2	3	3	3	2	1	2	-	2	2	3	3	3
23A037MT.5	3	2	3	3	3	2	1	2	-	2	2	3	3	3

G. Amarnath

(DD-N. Krishore Kumar)

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

MEETING MINUTES

of

BOARD OF STUDIES

ACADEMIC YEAR: 2026-27

ANNAMACHARYA INSTITUTE OF TCHNOLOGY & SCIENCES
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Ref. No.:/AITS/AIML/BOS-19/2026-27/MOM-19 Date: 10/06/2025

Department of Artificial Intelligence and Machine Learning 19th BoS Minutes of Meeting

The 19th meeting of the Board of Studies (BoS) for the Department of Artificial Intelligence and Machine Learning was held in Online mode on 08th June 2026 at 10:30AM, coordinated from Annamacharya Institute of Technology and Sciences (AITS), Rajampet, with the following members.

Members Present:

Sl. No	Name	Affiliation	Role in BoS	Signature
1	Dr. N. Penchalaiah	Associate Professor & HOD Department of AIML Ph: 9640435371 Email: penchalaiah550@gmail.com	Chairman	
2	Mrs. P. Swathi	Assistant Professor Dept. of AIML AITS, Rajampet Ph: 9666625725 Email: 1260swathi@gmail.com	Member	P. Swathi
3	Mr. N. Siva	Assistant Professor Dept. of CSE AITS, Rajampet Ph: 9640846838 Email: nsiva5809@gmail.com	Member	
4	Dr. C. Nagaraju	Dean of Engineering YSR Engineering College of Yogi Vemana University Proddatur, Kadapa Dist., Ph.9949218570. Nagaraju.c@yogivemanauniversity.ac.in	Outside subject Expert	Attended online
5	Dr. Srinivasa Rao. B	Professor School of Computer and Information Sciences (SCIS), University of Hyderabad. Prof. C.R. Rao Road, Gachibowli, Hyderabad 500046. Ph.9666428448. mail: srinivas.battula@uohyd.ac.in	Outside subject Expert	Attended online
6	Dr. K. Usha Rani	Professor, Dept. of Computer Science Sri Padmavathi Mahila Viswavidyalayam (Women's University), Tirupati. Ph.9440451010 Email: usharanikuruba@yahoo.co.in	University Nominee	Attended online
7	Mr. Praveen Bandaru	Lead Consultant, Sony India Software Centre Banglore, Ph.9550098800. mail: Praveen.bandaru@sony.com	Industry Expert	Attended online
8	Mr. S. Satheesh Reddy	Averixis Solutions Role - Business Development Associate, Hyderabad Mobile No - 9059645025 Gmail: saddalasatheesh@gmail.com	Alumni	Attended online

Members Absence: NIL

Agenda of the Meeting:

Item No	Particulars
BoS/2026/AIML/1	Welcome and Introduction
BoS/2026/AIML/2	Confirmation of the Minutes of the 18th Board of Studies held on 19.06.2025 and the action taken report of the same.
BoS/2026/AIML/3	Discussion on the R23 IV B. Tech course structure, with a detailed discuss on the IV Year syllabi.
BoS/2026/AIML/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.
BoS/2026/AIML/5	Any other item with the permission of the Chair.

MINUTES OF THE MEETING

BoS/2026/AIML/1	Welcome and Introduction

Welcome:

Dr. N. Penchalaiah, Head, Department of Artificial Intelligence and Machine learning has extended warm welcome to all the members.

Introduction:

Dr. N. Penchalaiah expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of Artificial Intelligence and Machine learning.

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 19th June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved. These included R23 II & III course structures and syllabi for B.Tech.

Dr. N. Penchalaiah informed the members that the minutes of the 18th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/AIML/2	Confirmation of the Minutes of the 18th Board of the Board of Studies held on 19.06.2025 and the action taken repot of the same.

Resolution:

The BOS Confirmed and approved 18th Board of Studies Meeting held on 19th June 2025 (Minutes of Meeting is enclosed in the **Annexure-I.**)

BoS/2026/AIML/3	Discussion on the R23 IV B. Tech course structure, with a detailed discuss on the IV Year syllabi.

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure and syllabus for the IV B.Tech program under the AITS R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

The Board unanimously approved the revised course structure and syllabus for IV-B.Tech. under the AITS R23 Regulations. The BoS further recommended that the finalized version be submitted to the Academic Council for ratification and be implemented from the academic year 2026–27.

The Course Structure and Syllabus for IV-B.Tech is enclosed in the **Annexure-II**

BoS/2026/AIML/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.

Resolution:

BOS Approved the List of Examiners for second-year Courses/Subjects.
The list of Examiners is attached in the **Annexure-III**

BoS/2026/AIML/5	Any other item with the permission of the Chair.

Resolution:

NIL

Dr. N. Penchalaiah
Chairman-BOS-AIML
AITS, Rajampet.

Internal Members:

1. Dr. N. Penchalaiah -
2. Mrs. P. Swathi -
3. Mr. N. Siva -

Head of the Department
Artificial Intelligence & Machine Learning
ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516 126, Kadapa Dist.

Attendance sheet:

BoS Members:

Sl.No	Name	Role in BoS	Signature with Date
1	Dr. N. Penchalaiah	Chairman	08/6/26
2	Mrs. P. Swathi	Member	P. Swathi 8/6/26
3	Mr. N. Siva	Member	08/6/26
4	Dr. C. Nagaraju	Member	Attended Online
5	Dr. B. Srinavasa Rao	Member	Attended Online
6	Dr. K. Usha Rani	Outside subject Expert	Attended Online
7	Mr. Praveen Bandaru	Outside subject Expert	Attended Online
8	Mr. S. Satheesh Reddy	University Nominee	Attended Online

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Academic Year 2026-27

Meeting : Board of Studies – Electronics and Communication Engineering

Date and Time : 12th June 2026 at 10:00 AM

Venue : AITS, Rajampet.

Minutes of 19th Board of Studies- Electronics and Communication Engineering meeting held on 12th June 2026 at AITS, Rajampet.

Members Present:

S.No.	Name of the Board Member	Designation	Institute/Industry	Role
		INTERNAL MEMBERS		
1.	Dr. J.Chinna Babu	Asso. Professor & Head Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Chairman
2.	Dr. Ch. Nagaraju	Professor, Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member
3.	Mrs. P. Syamala Devi	Assistant Professor Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member
4.	Mr. M. Hanumanthu	Assistant Professor Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member
5.	Dr. S. Fayaz Begum	Assistant Professor Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member
		EXTERNAL EXPERT MEMBERS		
6.	Dr N.N Murthy	Professor, Dept. of ECE	IIT Tirupati.	Member
7.	Dr. K. Murali	Professor & Head,	Narayana Engineering College, Nellore	Member
8.	Dr. G. Srinivasulu	Professor	SV University, Tirupati	Member
9.	Mr. Vikas Reddy Rapuru	Director	Technotran, Hyderabad. Telangana.	Member
10.	Mr. Syed Javeed Basha	Design Verification Engineer	Smart SOC Pvt. Ltd, Bangalore, Karnataka.	Member

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Agenda:

Item No.	Particulars
BoS/2023/ECE/UG/19.1	Ratification of 18th Board of Studies Meeting Minutes
BoS/2023/ECE/UG/19.2	Review of Current IV Year I & II Semesters Course structure and Syllabi.
BoS/2023/ECE/UG/19.3	Amendment to Include MOOC Courses in the Curriculum
BoS/2023/ECE/UG/19.4	Preparation and Approval of the Panel of External Examiners
BoS/2023/ECE/UG/19.5	Any Other Item with Permission of the Chair

RESOLUTIONS

Welcome Address by the chairman of BOS and Introduction of members

The Chairman welcomed all the members of the Board of Studies (BoS) in Electronics and Communication Engineering (ECE) for the R23 Regulations meeting. He introduced the external subject experts, Dr. N. N. Murthy, Professor, Department of Electrical Engineering, IIT Tirupati, and Dr. K. Murali, Professor and Head, Narayana Engineering College, Nellore. He also introduced the University Nominee, Dr. G. Srinivasulu, Professor, Sri Venkateswara University, Tirupati; the Industry Expert, Mr. Vikas Reddy Rapuru, Director, Technotran Pvt. Ltd., Hyderabad; and the Alumni Representative, Mr. S. Javeed Basha, Design Verification Engineer, Smart SoC Pvt. Ltd., Bengaluru, Karnataka. Thereafter, the internal BoS members were introduced.

The agenda of the ECE-BoS meeting was presented, and the forum was opened for detailed deliberations on the agenda items. The Chairman requested the members to provide their valuable suggestions and recommendations regarding the course structure & detailed syllabi of IV B.Tech. I & II Semesters under the R23 Regulations, ensuring alignment with the guidelines of AICTE and APSCHE. After extensive discussions and careful consideration of the proposed syllabi, the following resolutions and recommendations were made:

Item No. 19.1: Ratification of the 18th Board of Studies Meeting

The Chairman presented the minutes of the 18th Board of Studies Meeting of the Department of Electronics and Communication Engineering, Annamacharya Institute of Technology & Sciences (Autonomous), Rajampet, held on 12 July 2024, for ratification. The members reviewed the minutes and, after due deliberation and discussion, unanimously ratified the proceedings of the 18th BoS Meeting.

Item No. 19.2: Review of Current IV Year I & II Semesters Course structure and Syllabi

The Chairman of the Board of Studies proposed a review of the curriculum and detailed syllabi for IV B.Tech. I and II Semesters under the R23 Regulations. The members examined the proposed syllabus and offered the following observations and suggestions:

1. Dr. K. Murali, Professor and Head, Narayana Engineering College, Nellore, suggested that minor modifications to the course contents may be made wherever necessary to further enhance the relevance and effectiveness of the curriculum.
2. Dr. N. N. Murthy, Professor, Department of Electrical Engineering, IIT Tirupati, appreciated the overall organization of the course structure and the systematic placement of Professional Elective and Open Elective courses across the semesters. He opined that the curriculum was well-designed and provided a balanced progression of learning.
3. Dr. G. Srinivasulu, Professor, Sri Venkateswara University, Tirupati, and Mr. S. Javeed Basha, Alumni Representative and Design Verification Engineer, Smart SoC Pvt. Ltd., Bengaluru, reviewed the syllabus and expressed their satisfaction with the organization of the course contents and the placement of MOOC courses. They observed that the existing structure was appropriate and well-aligned with the programme objectives.
4. Mr. Vikas Reddy Rapuru, Director, Technotran Pvt. Ltd., Hyderabad, suggested reviewing the sequence of Professional Elective and Open Elective courses and, wherever appropriate, rearranging them to ensure better continuity and progressive learning throughout the programme.

After detailed deliberations, the Board appreciated the proposed curriculum and resolved to incorporate the necessary modifications and recommendations wherever applicable.

Item No. 19.3: Amendment to Include MOOC Courses in the Curriculum.

The Chairman of the Board of Studies presented the requirement to include a MOOC course in the IV B.Tech. I Semester curriculum as per the directions issued by JNTUA, Ananthapuramu. The proposal, along with the details of the course and its placement in the curriculum, was placed before the Board for discussion and approval. After due deliberations, the members approved the proposal. The details of the MOOC course and its placement are appended as Annexure-I.

Item No. 19.4: Preparation and Approval of the Panel of External Examiners.

The Chairman of the Board of Studies presented the proposed panel of external examiners and subject experts for the approval of the members. The Board reviewed the panel and, after detailed discussion,

approved the inclusion of qualified Ph.D. holders from reputed academic institutions and industries as external examiners and subject experts. The panel was unanimously ratified by the Board, and the finalized list is appended as Annexure-II.

Item No. 19.5: Any other item with the permission of chair

As all the agenda items had been discussed and resolved, the Chairman of the Board of Studies declared that there were no further matters for consideration and formally concluded the meeting.

Thereafter, the Chairman of the Board of Studies, Dr. J. Chinna Babu, proposed the Vote of Thanks. He expressed his sincere gratitude to all the BoS members for their active participation, constructive discussions, and valuable suggestions towards the development and refinement of the curriculum and syllabus. He also conveyed his appreciation to the external subject experts, University Nominee, industry expert, alumni representative, and all other members of the Board for their insightful contributions and support in making the deliberations fruitful and productive.

12/6/26

CHAIRMAN-BOS
Department of ECE
AITS, Rajampet.

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Attendance sheet:

BOS members:

S.No.	Name of the Board Member	Designation	Institute/Industry	Role	Signature
			INTERNAL MEMBERS		
1.	Dr. J.Chinna Babu	Asso. Professor & Head Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Chairman	
2.	Dr. Ch. Nagaraju	Professor, Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member	
3.	Mrs. P. Syamala Devi	Assistant Professor Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member	
4.	Mr. M. Hanumanthu	Assistant Professor Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member	
5.	Dr. S. Fayaz Begum	Assistant Professor Department of ECE	Annamacharya Institute of Technology & Sciences, Rajampet	Internal Member	
			EXTERNAL EXPERT MEMBERS		
6.	Dr N.N Murthy	Professor, Dept. of ECE	IIT Tirupati.	Member	**Attended Online**
7.	Dr. G. Srinivasulu	Professor	SV University, Tirupati	Member	**Attended Online**
8.	Dr. K. Murali	Professor & Head,	Narayana Engineering College, Nellore	Member	**Attended Online**
9.	Mr. Vikas Reddy Rapuru	Director,	Technotran, Hyderabad. Telangana.	Member	**Attended Online**
10.	Mr. Syed Javeed Basha	Design Verification Engineer	Smart SOC Pvt. Ltd, Bangalore, Karnataka.	Member	**Attended Online**

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Annexure-I

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

R23

IV YEAR COURSE STRUCTURE

I Semester							
S.No.	**Category**	**Code**	**Title**	**L**	**T**	**P**	**Credits**
1.	PCC	23A0471T	Data Communications and Networking	3	0	0	3
2	Management Course-II	23AHSM7CT	Management Science	2	0	0	2
		23AHSM7DT	Entrepreneurship and Incubation				
		23AHSM7ET	Human Resource Management				
3	PEC - IV	23A047AT	Radar Engineering	3	0	0	3
		23A047BT	DSP Processors & Architectures				
		23A047CT	5G Communications				
4	PEC - V	23A047DT	Low Power VLSI Design	3	0	0	3
		23A047ET	Wireless Sensor Networks				
		23A047FT	Cellular & Mobile Communications				
5	OEC-III	23A047GT	MOOCs	3	0	0	3
6	OEC-IV		Open Elective-IV	3	0	0	3
7	SOC - V	23A0472L	RF System Design tools	0	1	2	2
		23A0473L	Industrial IOT & Automation				
8	Audit Course	23AHS79T	Gender Sensitization	2	0	0	-
9	INTERN	23A0473I	Evaluation of Industry Internship	-	-	-	2
			Total	**19**	**1**	**2**	**21**

Open Elective – IV

S.No.	Code	Title	Offered by the Dept
1.	23A017IT	Geo-Spatial Technologies	CIVIL
2.	23A017JT	Solid Waste Management	
3.	23A027JT	Electric Vehicles	EEE
4.	23A037LT	Total Quality Management	ME
5.	23A057KT	Introduction to Computer Networks	CSE& Allied/IT
6.	23A057LT	Internet of Things	
7.	23A057MT	Introduction to Quantum Computing	
8.	23AHS75T	Financial Mathematics	Mathematics
9.	23AHS76T	Sensors And Actuators for Engineering Applications	Physics
10.	23AHS77T	Chemistry Of Nano materials And Applications	Chemistry
11.	23AHS78T	Literary Vibes	Humanities

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Open Electives offered by ECE for other Departments **R23**

SL. No	Category	Year & Sem	Course Code	Title	L	T	P	C
					3	0	0	3
1	OE 3	IV - I	23A047GT	MOOCs	3	0	0	3
2	OE 4	IV - I	23A047HT	Introduction to Image Processing	3	0	0	3
			23A047IT	VLSI Design				

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Annexure-II
LIST OF SUBJECT EXPERTS

S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1	Data Communications and Networking	Dr.M.V.Subramanyam	Professor	Shantiram Engg College, Nandyal
2		Dr.T.Lakshmi Narayana	HOD & Associate Professor	Dept of E.C.E, KLMCE,Kadapa
3		Dr D Suresh	Professor	RNSIT,Bengaluru
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	Radar Engineering	Dr.K.Mahesh Babu	Associate Professor	Dept of E.C.E, SVCE, Tirupathi
2		Dr.K. Murali	Professor	Dept. of ECE, NEC, Nellore
3		Dr.P.Shamsheer Khan	Associate Professor	Dept of E.C.E, GPRCE, Kurnool
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	VLSI Design	Dr.S.Naga Jyothi	Associate Professor	Dept of E.C.E, MITS, Madanapalli

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2		Dr.K.V.Ramanaiah	Professor	Dept. of ECE, YSR Engg College, Proddutur
3		Dr G Sudheer Kumar	Associate Professor	Dept. of ECE, GPREC,Kurnool
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	Introduction to Image Processing	Dr G Sudheer Kumar	Associate Professor	Dept. of ECE, GPREC,Kurnool
2		Dr S Martin	Associate Professor	Dept. of ECE, Karunya University
3		Dr. V. Jyothi	Associate Professor	Department of ECE, Vardhaman College of Engineering, Hyderabad.
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	5G Communication	Dr K Harikishore	Professor	KLU,Vijayawada
2		Dr.K.Mahesh Babu	Associate Professor	Dept of E.C.E, SVCE, Tirupathi
3		Dr.S.Naga Jyothi	Associate Professor	Dept of E.C.E, MITS, Madanapalli

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S.No	Subject Title & Code	Subject Expert Name	Designation	Address
1	Wireless Sensor Networks	Dr G Sudheer Kumar	Associate Professor	Dept. of ECE, GPREC,Kurnool
2		Dr S Martin	Associate Professor	Dept. of ECE, Karunya University
3		Dr.S.Naga Jyothi	Associate Professor	Dept of E.C.E, MITS, Madanapalli
S.No	**Subject Title & Code**	**Subject Expert Name**	**Designation**	**Address**
1	Cellular & Mobile Communications	Dr.K. Murali	Professor	Dept. of ECE, NEC, Nellore
2		Dr.P.Shamsheer Khan	Associate Professor	Dept of E.C.E, GPRCE, Kurnool
3		Dr S. Shafiulla Basha	Assistant Professor	Dept. of ECE, YVU, Proddatur
S.No	**Subject Title & Code**	Dr S Mahaboob Basha	Professor	Dept of ECE, SIETK, Puttur
1	DSP Processors & Architectures	Dr. B. Saroja	Professor	GIT,Nellore
2		Dr B Polaiah	Professor	KLU,Vijayawada
3		Dr S Mahaboob Basha	Professor	Dept of ECE, SIETK, Puttur

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MEETING MINUTES

of

BOARD OF STUDIES

ACADEMIC YEAR: 2026-27

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
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Ref. No.:/AITS/CSE/BOS-19/2026-27/MOM-19. Date: 06/06/2026

Department of Computer Science and Engineering 19th BoS Minutes of Meeting

The 19th meeting of the Board of Studies (BoS) for the Department of Computer Science and Engineering was held in hybrid mode on 6th June 2026 in Silicon lab of the CSE Block at 10:30 AM, with the following members of the board present.

Members Present:

Sl. No	Name	Affiliation	Role in BoS
1	Dr. M. Subba Rao	Professor & Head Dept. of CSE, AITS, Rajampet. Ph: 9848885492 msraoswap@gmal.com	Chairman
2	Dr. T. Harikrishna	Associate Professor Dept. of CSE, AITS, Rajampet. Ph: 9441325066 thk.itd@gmal.com	Member
3	Dr. M. Sankara Prasanna Kumar	Assistant Professor Dept. of CSE, AITS, Rajampet Ph: 9866395769 sankaraprasannakumar@gmail.com	Member
4	Mr. D. Subhash Chandra Mouli	Assistant Professor Dept. of CSE, AITS, Rajampet Ph: 9640846838 dschandramouli@gmail.com	Member
5	Mrs. G. I. K. Durga Bhavani	Assistant Professor Dept. of CSE AITS, Rajampet Ph: 9642963818 bhavani.kurnool@mail.com	Member
6	Dr. S. Ravi Chandra	Professor in CSE, NIT Warangal, Telangana Ph: 8332969414 ravic@nitw.ac.in	Member
7	Mr. Venkata Rao Lellapall	Programme Manager CAPGEMINI India Pvt.ltd., Hyderabad Ph: 995974573 Email: venkatarao.lellapalli@capgemini.com	Member
8	Mr. Palle Reddaiah	Team Lead, Kyndryl India Pvt.Ltd., Hyderabad, Telangana, Ph. 9052008787 palle.reddeiah@kyndryl.com	Member

Members of Absence:

Sl. No	Name	Affiliation	Role in BoS
1	Dr. Madhu Mutyam	Professor in CSE, IIT Madras, Chennai Ph: 9952982971 madhu@cse.iitm.ac.in	Member
2	Dr. Ch. Sudhakar	Professor in CSE, NIT Warangal, Telangana Ph: 9440647945 chapram@nitw.ac.in	Member

Agenda of the Meeting:

Item No	Particulars
BoS/2026/CSE/1	Welcome and Introduction
BoS/2026/CSE/2	Confirmation of the Minutes of the 18th Board of the Board of Studies held on 21.06.2025.
BoS/2026/CSE/3	Discussion on the R23 IV B. Tech. course structure, with a detailed discuss on the IV Year syllabi.
BoS/2026/CSE/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.
BoS/2026/CSE/5	Any other item with the permission of the Chair.

MINUTES OF THE MEETING

BoS/2026/CSE/1	Welcome and Introduction

Welcome:

Dr. M. Subba Rao, Head, Department of Computer Science & Engineering has extended warm welcome to all the members.

Introduction:

Dr. M. Subba Rao expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of Computer Science and Engineering.

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 21st June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved.

Dr. M. Subba Rao informed the members that the minutes of the 19th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/CSE/2	Confirmation of the Minutes of the 18th Board of Studies held on 21.06.2025.

Resolution:

The BOS Confirmed and approved 18th Board of Studies Meeting held on 21th June 2025 (Minutes of Meeting is enclosed in the **Annexure-I.**)

BoS/2026/CSE/3	Discussion on the R23 IV B. Tech. course structure, with a detailed discuss on the IV-Year syllabi.

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure and syllabus for the IV-B.Tech. program under the AITS R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

BOS resolved that students shall be permitted to apt one MOOC course through Swayam or **NPTEL in place of one Open Elective or Professional Elective as per the academic**

regulations. The selected MOOC course shall be relevant to program, carry equivalent credit s and shall not duplicate course already include in curriculum. Further it is resolved that the department shall prepare list of approved MOOC courses for the benefit of students. Hence the BoS unanimously approved provision of **opting one MOOC course under Open elective or Professional elective in R23 Curriculum**.

The Course Structure and Syllabus for IV-B. Tech is enclosed in the **Annexure-II**

BoS/2026/CSE/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.

Resolution:

BOS Approved the List of Examiners for Third -year Courses / Subjects.

The list of Examiners is attached in the **Annexure-III**

BoS/2026/CSE/5	Any other item with the permission of the Chair.

Resolution:

NIL

Dr. M. Subba Rao
Chairman-BOS-CSE
AITS, Rajampet.

Internal Members:

1. Dr. T. Harikrisha -
2. Dr. M. Sankara Prasanna Kumar -
3. Mr. D. Subhash Chandra Mouli -
4. Mrs. G. I. K. Durga Bhavani -

Attendance sheet:

BoS Members:

Sl. No	Name	Role in BoS	Signature with Date
1	Dr. M. Subba Rao	Chairman	
2	Dr. T. Hari Krishna	Member	
3	Mr. D. Subhash Chandra Mouli	Member	
4	Dr. M. Sankara Prasanna Kumar	Member	
5	Mrs. G. I. K. Durga Bhavani	Member	
6	Dr. Madhu Mutyam	Course Coordinator - Member	Absent
7	Dr. S. Ravi Chandra	Course Coordinator - Member	Attended Online
8	Dr. Ch. Sudhakar	Subject Expert - Member	Absent
9	Mr. Venkata Rao Lellapall	Subject Expert - Member	Attended Online
10	Mr. Palle Reddaiah	University Nominee Member	Attended Online

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

Thallapaka Panchayath, New Boyanapalli, Rajampet, Annamayya Dist., A.P. – 516126
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Accredited by NBA (CSE, ECE & EEE), Autonomous conferred by UGC, New Delhi under Section 2(f) & 12 (B)

Meeting: Board of Studies- Artificial Intelligence and Data Science.
Date and Time: 08-06-2025
Venue: AITS, Rajampet and Online (Microsoft Teams)

Minutes of 19th Board of Studies- Artificial Intelligence and Data Science meeting held on 08th June 2026 in Online (Microsoft Teams).

Members Present:

1. Dr. P Phanindra Kumar Reddy - Chairman
2. Mr. S Ashok Kumar - Member
3. Mr. B Venkatesu Goud - Member
4. Dr. B.R. Chandavarkar - Member
5. Dr. R. Rajasekhar - Member
6. Mr. Varun Kumar Reddy Gangu - Member
7. Mr. B. Krishna Reddy - Member

Members Absent:

1. Dr. V.C. Bharathi - Member

Agenda of the Meeting:

Item No	Particulars
BoS/2026/AI&DS/1	Welcome and Introduction
BoS/2026/ AI&DS /2	Confirmation of the Minutes of the 18th Board of Studies Meeting
BoS/2026/ AI&DS /3	Discussion and Finalization of Course Structure for IV-B.Tech. under R23 Regulations
BoS/2026/ AI&DS /4	Discussion and Finalization of Syllabus for IV-B.Tech. under R23 Regulations.
BoS/2026/ AI&DS /5	To approve the list of examiners for IV-B.Tech courses/subjects
BoS/2026/ AI&DS /6	Any other item with permission of the Chair

MINUTES OF THE MEETING

BoS/2026/AI&DS/1	Welcome and Introduction

Welcome:

Dr. P Phanindra Kumar Reddy, Head, Department of Artificial Intelligence and Data Science has extended warm welcome to all the members.

Introduction:

Dr. P Phanindra Kumar Reddy expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of Artificial Intelligence and Data Science.

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 21st June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved.

Dr. P Phanindra Kumar Reddy informed the members that the minutes of the 18th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/ AI&DS/2	Confirmation of the Minutes of the 18th Board of Studies Meeting

Resolution:

The BOS Confirmed and approved Artificial Intelligence and Data Science Department's 18th Board of Studies Meeting held on 21st June 2025.

The list is enclosed in the Annexure-I.

BoS/2026/ AI&DS /3	Discussion and Finalization of Course Structure for IV -B.Tech. under R23 Regulations

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure for the IV -B.Tech. under R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

The Course Structure for IV -B.Tech is attached in the Annexure-II

BoS/2026/ AI&DS /4	Discussion and Finalization of Syllabus for IV -B.Tech. under R23 Regulations

Resolution:

During the discussion in the Board of Studies, Dr. B. R. Chandavarkar , Associate Professor, NITK, Surathkal recommended the following points:

- It was suggested to allot a faculty guide/mentor to each student during the internship period for continuous monitoring and academic support.
- The BoS members also recommended allowing the respective company/industry to assess the performance of the students during the internship based on their work, participation, and learning outcomes.

Dr. R. Rajasekhar Professor, Dept. of CSE, JNTUA, Anantapuramu, recommended the following point

- It was proposed to replace the Professional Elective Course with a MOOC course as per the directions and current academic requirements.

BoS/2026/ AI&DS /5	To approve the list of examiners for IV-B.Tech courses/subjects

Resolution:

BOS Approved the List of Examiners for IV-B.Tech Courses/Subjects.

The list of Examiners is attached in the Annexure-IV

BoS/2026/ AI&DS /5	Any other item with permission of the Chair

Resolution:

NIL

Dr. P Phanindra Kumar Reddy
Chairman-BoS-AI&DS,
AITS, Rajampet.
Head of the Department
Artificial Intelligence & Data Science
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516 126, Kadapa Dist

Internal Members:

1. Dr. P Phanindra Kumar Reddy -
2. Mr. S Ashok Kumar -
3. Mr. B Venkatesu Goud -

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Accredited by NBA (CSE, ECE & EEE), Autonomous conferred by UGC, New Delhi under Section 2(f) & 12 (B)

Artificial Intelligence and Data Science, Computer Science & Engineering (Data Science)

Date: 08-06-2026

Following are the list of B.o.S members attended to 19th Board of Studies meeting held on 08-06-2026 in the in Online Mode, Microsoft teams for the departments of Artificial Intelligence & Data Science, Computer Science and Engineering(Data Science), AITS, Rajampet.

S.No.	Name of the Member	Account Details	Present/Absent
1	Ex-officio Dr. P Phanindra Kumar Reddy Associate Professor & Head Dept. of AI&DS, A.I.T.S. Rajampet.	Internal Members	Present
2	Internal Member Mr. S Ashok Kumar Assistant Professor, Dept. of AI&DS, A.I.T.S, Rajampet.		
3	Internal Member Mr. B Venkatesu Goud Assistant Professor, Dept. of AI&DS, A.I.T.S, Rajampet.		
4	Outside Subject Expert Dr. V C Bharathi, Professor, VIT-AP University, Amaravati, Andhra Pradesh, India Phone:+91 96007 08416, Email:bharathi.vc@vitap.ac.in	Indian Bank Account details: Acco.No: 735353495 Name: V.C.Bharathi Bank name: Indian Bank Branch name: AEC, Tiruvannamalai,Tamilnadu IFSC Code: IDIB000A127	Absent
5	Outside Subject Expert Dr. B. R. Chandavarkar, Associate Professor, NITK,Surathkal E-mail. brc@nitk.edu.in, brcnitk@gmail.com Telephone: 0824- 2473408	Bank: SBI, Branch: NITK, Name: B R Chandavarkar, Acc. No.: 30293116030, IFSC: SBIN0002273.	Present
6	University Nominee Dr. R. Rajasekhar Professor Dept. of CSE, JNTUA, Anantapuramu Ph. 9966660226, Mail: drasharaj2002@gmail.com	Details Submitted to office	Present
7	Industry Expert: Varun Kumar Reddy Gangu; Designation: Software Architect Company Name: ICE data services Email id: varunkumarreddy.gangu@ice.com Mobile: +91 7674946949	Bank: SBI Branch: BHEL TOWNSHIP HYDERABAD Name: Varun Kumar Reddy Gangu Account No.: 62248649611 IFSC: SBIN0020075	Present
8	Alumni Member: B. Krishna Reddy, Mobile: +91 6302272347, Email: soulkittu6666@gmail.com	Bank: HDFC Branch: NGO COLONY CUDDAPAH Name: BOVILLA KRISHNA REDDY Account No.:50100666280208 IFSC:HDFC0008162	Present

HoD – AI&DS

BoS Chairman

Head of the Department
Artificial Intelligence & Data Science
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516 126, Kadapa Dist

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

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Meeting: Board of Studies- Computer Science and Engineering(Data Science).
Date and Time: 08-06-2025
Venue: AITS, Rajampet and Online (Microsoft Teams)

Minutes of 19th Board of Studies- Computer Science and Engineering(Data Science) meeting held on 08th June 2026 in Online (Microsoft Teams).

Members Present:

1. Dr. P Phanindra Kumar Reddy - Chairman
2. Mr. S Ashok Kumar - Member
3. Mr. B Venkatesu Goud - Member
4. Dr. B.R. Chandavarkar - Member
5. Dr. R. Rajasekhar - Member
6. Mr. Varun Kumar Reddy Gangu - Member
7. Mr. B. Krishna Reddy - Member

Members Absent:

2. Dr. V.C. Bharathi - Member

Agenda of the Meeting:

Item No	Particulars
BoS/2026/ CSE(DS)//1	Welcome and Introduction
BoS/2026/ CSE(DS)//2	Confirmation of the Minutes of the 18th Board of Studies Meeting
BoS/2026/ CSE(DS)//3	Discussion and Finalization of Course Structure for IV-B.Tech. under R23 Regulations
BoS/2026/ CSE(DS)//4	Discussion and Finalization of Syllabus for IV-B.Tech. under R23 Regulations
BoS/2026/ CSE(DS)//5	To approve the list of examiners for IV-B.Tech courses/subjects
BoS/2026/ CSE(DS)//6	Any other item with permission of the Chair

MINUTES OF THE MEETING

BoS/2026/CSE(DS)/1	Welcome and Introduction

Welcome:

Dr. P Phanindra Kumar Reddy, Head, Department of Computer Science and Engineering (Data Science) has extended warm welcome to all the members.

Introduction:

Dr. P Phanindra Kumar Reddy expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of Computer Science and Engineering (Data Science).

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 21st June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved.

Dr. P Phanindra Kumar Reddy informed the members that the minutes of the 18th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/ CSE(DS)/2	Confirmation of the Minutes of the 18th Board of Studies Meeting

Resolution:

The BOS Confirmed and approved of Computer Science and Engineering (Data Science) Department's 18th Board of Studies Meeting held on 21st June 2025.

The list is enclosed in the Annexure-I.

BoS/2026/CSE(DS)/3	Discussion and Finalization of Course Structure for IV -B.Tech. under R23 Regulations

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure for the IV-B.Tech. under R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

The Course Structure for IV-B.Tech is attached in the Annexure-II

BoS/2026/CSE(DS)/4	Discussion and Finalization of Syllabus for IV -B.Tech. under R23 Regulations

Resolution:

During the discussion in the Board of Studies, Dr. B. R. Chandavarkar , Associate Professor, NITK, Surathkal recommended the following points:

- It was suggested to allot a faculty guide/mentor to each student during the internship period for continuous monitoring and academic support.
- The BoS members also recommended allowing the respective company/industry to assess the performance of the students during the internship based on their work, participation, and learning outcomes.

Dr. R. Rajasekhar Professor Dept. of CSE, JNTUA, Anantapuramu, recommended the following point

- It was proposed to replace the Professional Elective Course with a MOOC course as per the directions and current academic requirements.

BoS/2026/CSE(DS)/5	To approve the list of examiners for IV-B.Tech courses/subjects

Resolution:

BOS Approved the List of Examiners for IV-B.Tech Courses/Subjects.

The list of Examiners is attached in the Annexure-IV

BoS/2026/CSE(DS)/6	Any other item with permission of the Chair

Resolution:

NIL

Dr. P Phanindra Kumar Reddy
Chairman-BoS- CSE(DS),
AITS, Rajampet.

Head of the Department
Artificial Intelligence & Data Science
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516126, Kadapa Dist.

Internal Members:

1. Dr. P Phanindra Kumar Reddy -
2. Mr. S Ashok Kumar -
3. Mr. B Venkatesu Goud -

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Artificial Intelligence and Data Science, Computer Science & Engineering (Data Science)

Date: 08-06-2026

Following are the list of B.o.S members attended to 19th Board of Studies meeting held on 08-06-2026 in the in Online Mode, Microsoft teams for the departments of Artificial Intelligence & Data Science, Computer Science and Engineering(Data Science), AITS, Rajampet.

S.No.	Name of the Member	Account Details	Present/Absent
1	Ex-officio Dr. P Phanindra Kumar Reddy Associate Professor & Head Dept. of AI&DS, A.I.T.S. Rajampet.	Internal Members	Present
2	Internal Member Mr. S Ashok Kumar Assistant Professor, Dept. of AI&DS, A.I.T.S, Rajampet.		
3	Internal Member Mr. B Venkatesu Goud Assistant Professor, Dept. of AI&DS, A.I.T.S, Rajampet.		
4	Outside Subject Expert Dr. V C Bharathi, Professor, VIT-AP University, Amaravati, Andhra Pradesh, India Phone:+91 96007 08416, Email:bharathi.vc@vitap.ac.in	Indian Bank Account details: Acco.No: 735353495 Name: V.C.Bharathi Bank name: Indian Bank Branch name: AEC, Tiruvannamalai,Tamilnadu IFSC Code: IDIB000A127	Absent
5	Outside Subject Expert Dr. B. R. Chandavarkar, Associate Professor, NITK,Surathkal E-mail: brc@nitk.edu.in, brcnitk@gmail.com Telephone: 0824- 2473408	Bank: SBI, Branch: NITK, Name: B R Chandavarkar, Acc. No.:30293116030, IFSC: SBIN0002273	Present
6	University Nominee Dr. R. Rajasekhar Professor Dept. of CSE, JNTUA, Anantapuramu Ph. 9966660226. Mail: drasharaj2002@gmail.com	Details Submitted to office	Present
7	Industry Expert: Varun Kumar Reddy Gangu, Designation: Software Architect Company Name: ICE data services Email id: varunkumarreddy.gangu@ice.com Mobile: +91 7674946949	Bank: SBI Branch: BHEL TOWNSHIP HYDERABAD. Name: Varun Kumar Reddy Gangu Account No.: 62248649611 IFSC: SBIN0020075	Present
8	Alumni Member: B. Krishna Reddy, Mobile: +91 6302272347, Email: soulkittu6666@gmail.com	Bank: HDFC Branch: NGO COLONY CUDDAPAH Name: BOVILLA KRISHNA REDDY. Account No.:50100666280208 IFSC:HDFC0008162	Present

HoD – AI&DS

BoS Chairman

Head of the Department
Artificial Intelligence & Data Science
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516 126, Kadapa Dist.

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(Institute Accrdiated by N.A.A.C, Bangolore)(Institute Accrediated by IE(I),Kolkata)

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

MEETING MINUTES

of

BOARD OF STUDIES

ACADEMIC YEAR: 2026-27

ANNAMACHARYA INSTITUTE OF TCHNOLOGY & SCIENCES
(An Autonomous institution)
(Approved by A.I.C.T.E, New Delhi & Affiliated to JNTU Anantapur, Anantapuramu)
(Institute Accrdiated by N.A.A.C, Bangolore)(Institute Accrediated by IE(I),Kolkata)

Ref. No.:/AITS/AIML/BOS-19/2026-27/MOM-19 Date: 10/06/2025

Department of Artificial Intelligence and Machine Learning 19th BoS Minutes of Meeting

The 19th meeting of the Board of Studies (BoS) for the Department of Artificial Intelligence and Machine Learning was held in Online mode on 08th June 2026 at 10:30AM, coordinated from Annamacharya Institute of Technology and Sciences (AITS), Rajampet, with the following members.

Members Present:

Sl. No	Name	Affiliation	Role in BoS	Signature
1	Dr. N. Penchalaiah	Associate Professor & HOD Department of AIML Ph: 9640435371 Email: penchalaiah550@gmail.com	Chairman	
2	Mrs. P. Swathi	Assistant Professor Dept. of AIML AITS, Rajampet Ph: 9666625725 Email: 1260swathi@gmail.com	Member	P.Swathi
3	Mr. N. Siva	Assistant Professor Dept. of CSE AITS, Rajampet Ph: 9640846838 Email: nsiva5809@gmail.com	Member	
4	Dr. C. Nagaraju	Dean of Engineering YSR Engineering College of Yogi Vemana University Proddatur, Kadapa Dist., Ph.9949218570. Nagaraju.c@yogivemanauniversity.ac.in	Outside subject Expert	Attended online
5	Dr. Srinivasa Rao. B	Professor School of Computer and Information Sciences (SCIS), University of Hyderabad. Prof. C.R. Rao Road, Gachibowli, Hyderabad 500046. Ph.9666428448. mail: srinivas.battula@uohyd.ac.in	Outside subject Expert	Attended online
6	Dr. K. Usha Rani	Professor, Dept. of Computer Science Sri Padmavathi Mahila Viswavidyalayam (Women's University), Tirupati. Ph.9440451010 Email: usharanikuruba@yahoo.co.in	University Nominee	Attended online
7	Mr. Praveen Bandaru	Lead Consultant, Sony India Software Centre Banglore, Ph.9550098800. mail: Praveen.bandaru@sony.com	Industry Expert	Attended online
8	Mr. S. Satheesh Reddy	Averixis Solutions Role - Business Development Associate, Hyderabad Mobile No - 9059645025 Gmail: saddalasatheesh@gmail.com	Alumni	Attended online

Members Absence: NIL

Agenda of the Meeting:

Item No.	Particulars
BoS/2026/AIML/1	Welcome and Introduction
BoS/2026/AIML/2	Confirmation of the Minutes of the 18th Board of Studies held on 19.06.2025 and the action taken report of the same.
BoS/2026/AIML/3	Discussion on the R23 IV B. Tech course structure, with a detailed discuss on the IV Year syllabi.
BoS/2026/AIML/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.
BoS/2026/AIML/5	Any other item with the permission of the Chair.

MINUTES OF THE MEETING

BoS/2026/AIML/1	Welcome and Introduction

Welcome:

Dr. N. Penchalaiah, Head, Department of Artificial Intelligence and Machine learning has extended warm welcome to all the members.

Introduction:

Dr. N. Penchalaiah expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of Artificial Intelligence and Machine learning.

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 19th June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved. These included R23 II & III course structures and syllabi for B.Tech.

Dr. N. Penchalaiah informed the members that the minutes of the 18th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/AIML/2	Confirmation of the Minutes of the 18th Board of the Board of Studies held on 19.06.2025 and the action taken repot of the same.

Resolution:

The BOS Confirmed and approved 18th Board of Studies Meeting held on 19th June 2025 (Minutes of Meeting is enclosed in the **Annexure-I.**)

BoS/2026/AIML/3	Discussion on the R23 IV B. Tech course structure, with a detailed discuss on the IV Year syllabi.

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure and syllabus for the IV B.Tech program under the AITS R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

The Board unanimously approved the revised course structure and syllabus for IV-B.Tech. under the AITS R23 Regulations. The BoS further recommended that the finalized version be submitted to the Academic Council for ratification and be implemented from the academic year 2026–27.

The Course Structure and Syllabus for IV-B.Tech is enclosed in the **Annexure-II**

BoS/2026/AIML/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.

Resolution:

BOS Approved the List of Examiners for second-year Courses/Subjects.
The list of Examiners is attached in the **Annexure-III**

BoS/2026/AIML/5	Any other item with the permission of the Chair.

Resolution:

NIL

Dr. N. Penchalaiah
Chairman-BOS-AIML
AITS, Rajampet.

Internal Members:

1. Dr. N. Penchalaiah -
2. Mrs. P. Swathi -
3. Mr. N. Siva -

Artificial Int. Machine Learning
ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516 126, Kadapa Dist.

Attendance sheet:

BoS Members:

Sl.No	Name	Role in BoS	Signature with Date
1	Dr. N. Penchalaiah	Chairman	08/6/26
2	Mrs. P. Swathi	Member	P. Swathi 8/6/26
3	Mr. N. Siva	Member	08/6/26
4	Dr. C. Nagaraju	Member	Attended Online
5	Dr. B. Srinavasa Rao	Member	Attended Online
6	Dr. K. Usha Rani	Outside subject Expert	Attended Online
7	Mr. Praveen Bandaru	Outside subject Expert	Attended Online
8	Mr. S. Satheesh Reddy	University Nominee	Attended Online

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
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(Institute Accrdiated by N.A.A.C, Bangolore)(Institute Accrediated by IE(I),Kolkata)

DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE)

MEETING MINUTES

of

BOARD OF STUDIES

ACADEMIC YEAR: 2026-27

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
(An Autonomous institution)
(Approved by A.I.C.T.E, New Delhi & Affiliated to JNTU Anantapur, Anantapuramu)
(Institute Accrdiated by N.A.A.C, Bangolore)(Institute Accrediated by IE(I),Kolkata)

Ref. No.:/AITS/CSE(AI)/BOS-19/2026-27/MOM-19 Date: 10/06/2026

Department of CSE (Artificial Intelligence) 19th BoS Minutes of Meeting

The 19th meeting of the Board of Studies (BoS) for the Department of CSE (Artificial Intelligence) was held in Online Mode on 08th June 2026 at 10:30 AM, coordinated from Annamacharya Institute of Technology and Sciences (AITS), Rajampet, with the following members.

Members Present:

Sl. No	Name	Affiliation	Role in BoS	Signature
1	Dr. N. Penchalaiah	Associate Professor & HOD Department of AIML Ph: 9640435371 Email: penchalaiah550@gmail.com	Chairman	
2	Mrs. P. Swathi	Assistant Professor Dept. of AIML AITS, Rajampet Ph: 9666625725 Email: 1260swathi@gmail.com	Member	
3	Mr. N. Siva	Assistant Professor Dept. of AIML AITS, Rajampet Ph: 7799468785 Email: nsiva5809@gmail.com	Member	
4	Dr. C. Nagaraju	Dean of Engineering YSR Engineering College of Yogi Vemana University Proddatur, Kadapa Dist., Ph.9949218570. Nagaraju.c@yogivemanauniversity.ac.in	Outside subject Expert	Attended online
5	Dr. Srinivasa Rao. B	Professor School of Computer and Information Sciences (SCIS), University of Hyderabad. Prof. C.R. Rao Road, Gachibowli, Hyderabad 500046. Ph.9666428448. mail: srinivas.battula@uohyd.ac.in	Outside subject Expert	Attended online
6	Dr. K. Usha Rani	Professor, Dept. of Computer Science Sri Padmavathi Mahila Viswavidyalayam (Women's University), Tirupati. Ph.9440451010 Email: usharanikuruba@yahoo.co.in	University Nominee	Attended online
7	Mr. Praveen Bandaru	Lead Consultant, Sony India Software Centre Banglore, Ph.9550098800. mail: Praveen.bandaru@sony.com	Industry Expert	Attended online
8	Mr. S. Satheesh Reddy	Averixis Solutions Role - Business Development Associate, Hyderabad Mobile No - 9059645025 Gmail: saddalasatheesh@gmail.com	Alumni	Attended online

Members of Absence: NIL

Agenda of the Meeting:

Item No	Particulars
BoS/2026/CSE(AI)/1	Welcome and Introduction
BoS/2026/CSE(AI)/2	Confirmation of the Minutes of the 18th Board of the Board of Studies held on 19.06.2025 and the action taken report of the same.
BoS/2026/CSE(AI)/3	Discussion on the R23 IV B. Tech course structure, with a detailed discuss on the IV Year syllabi.
BoS/2026/CSE(AI)/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.
BoS/2026/CSE(AI)/5	Any other item with the permission of the Chair.

MINUTES OF THE MEETING

BoS/2026/CSE(AI)/1	Welcome and Introduction

Welcome:

Dr. N. Penchalaiah, Head, Department of CSE (Artificial Intelligence) has extended warm welcome to all the members.

Introduction:

Dr. N. Penchalaiah expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of CSE (Artificial Intelligence).

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 19th June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved. These included R23 II & III course structures and syllabi for B.Tech.

Dr. N. Penchalaiah informed the members that the minutes of the 18th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/CSE(AI)/2	Confirmation of the Minutes of the 18th Board of the Board of Studies held on 19.06.2025 and the action taken repot of the same.

Resolution:

The BOS Confirmed and approved 18th Board of Studies Meeting held on 19th June 2025 (Minutes of Meeting is enclosed in the **Annexure-I.**)

BoS/2026/CSE(AI)/3	Discussion on the R23 IV B. Tech course structure, with a detailed discuss on the IV Year syllabi.

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure and syllabus for the IV B.Tech. program under the AITS R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

During the discussion, the Board unanimously **approved the revised course structure and syllabus for IV-B.Tech.** under the AITS R23 Regulations. The BoS further recommended that the finalized version be submitted to the Academic Council for ratification and be implemented from the academic year 2026–27.

The Course Structure and Syllabus for IV-B.Tech is enclosed in the **Annexure-II**

BoS/2026/CSE(AI)/4	To consider and approve the panel of examiners for external examination for the Academic year 2026-27.

Resolution:

BOS Approved the List of Examiners for second-year Courses/Subjects.
The list of Examiners is attached in the **Annexure-III**

BoS/2026/CSE(AI)/5	Any other item with the permission of the Chair.

Resolution:

NIL

Dr. N. Penchalaiah
Chairman-BOS-CSE(AI)
AITS, Rajampet.

Internal Members:

1. Dr. N. Penchalaiah -
2. Mrs. P. Swathi - P. Swathi
3. Mr. N. Siva -

Head of the Department
Artificial Intelligence & Machine Learning
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516 126, Kadapa Dist.

Attendance sheet:

BoS Members:

Sl.No	Name	Role in BoS	Signature with Date
1	Dr. N. Penchalaiah	Chairman	08/6/26
2	Mrs. P. Swathi	Member	P. Swathi 8/6/26
3	Mr. N. Siva	Member	08/6/26
4	Dr. C. Nagaraju	Member	Attended Online
5	Dr. B. Srinavasa Rao	Member	Attended Online
6	Dr. K. Usha Rani	Outside subject Expert	Attended Online
7	Mr. Praveen Bandaru	Outside subject Expert	Attended Online
8	Mr. S. Satheesh Reddy	University Nominee	Attended Online

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

Thallapaka Panchayath, New Boyanapalli, Rajampet, Annamayya Dist., A.P. – 516126
(Approved by A.I.C.T.E, New Delhi & Affiliated to JNTU Anantapur, Anantapuramu)
(Institute Accredited by NAAC, Bangalore) (Institute Accredited by IE (I), Kolkata)
Accredited by NBA (CSE, ECE & EEE), Autonomous conferred by UGC, New Delhi under Section 2(f) & 12 (B)

Meeting: Board of Studies- Computer Science and Engineering(Data Science).
Date and Time: 08-06-2026
Venue: AITS, Rajampet and Online (Microsoft Teams)

Minutes of 19th Board of Studies- Computer Science and Engineering(Data Science) meeting held on 08th June 2026 in Online (Microsoft Teams).

Members Present:

1. Dr. P Phanindra Kumar Reddy - Chairman
2. Mr. S Ashok Kumar - Member
3. Mr. B Venkatesu Goud - Member
4. Dr. B.R. Chandavarkar - Member
5. Dr. R. Rajasekhar - Member
6. Mr. Varun Kumar Reddy Gangu - Member
7. Mr. B. Krishna Reddy - Member

Members Absent:

2. Dr. V.C. Bharathi - Member

Agenda of the Meeting:

Item No	Particulars
BoS/2026/ CSE(DS)//1	Welcome and Introduction
BoS/2026/ CSE(DS)//2	Confirmation of the Minutes of the 18th Board of Studies Meeting
BoS/2026/ CSE(DS)//3	Discussion and Finalization of Course Structure for IV-B.Tech. under R23 Regulations
BoS/2026/ CSE(DS)//4	Discussion and Finalization of Syllabus for IV-B.Tech. under R23 Regulations
BoS/2026/ CSE(DS)//5	To approve the list of examiners for IV-B.Tech courses/subjects
BoS/2026/ CSE(DS)//6	Any other item with permission of the Chair

MINUTES OF THE MEETING

BoS/2026/CSE(DS)/1	Welcome and Introduction

Welcome:

Dr. P Phanindra Kumar Reddy, Head, Department of Computer Science and Engineering (Data Science) has extended warm welcome to all the members.

Introduction:

Dr. P Phanindra Kumar Reddy expressed his gratitude for their continued support and valuable contributions toward strengthening the academic framework of the Department of Computer Science and Engineering (Data Science).

Before proceeding with the day's agenda, he recalled the proceedings of the 18th Board of Studies Meeting held on 21st June 2025. He stated that the meeting had been a significant step in shaping the academic direction of the department, with several key items discussed and approved.

Dr. P Phanindra Kumar Reddy informed the members that the minutes of the 18th meeting had been documented and circulated in advance for their review. He then requested the board to kindly confirm the minutes as recorded and invited any comments or suggestions for modification, if necessary.

BoS/2026/ CSE(DS)/2	Confirmation of the Minutes of the 18th Board of Studies Meeting

Resolution:

The BOS Confirmed and approved of Computer Science and Engineering (Data Science) Department's 18th Board of Studies Meeting held on 21st June 2025.

The list is enclosed in the Annexure-I.

BoS/2026/CSE(DS)/3	Discussion and Finalization of Course Structure for IV -B.Tech. under R23 Regulations

Resolution:

The Board of Studies (BoS) convened to review, discuss, and finalize the proposed course structure for the IV - B.Tech. under R23 Regulations. The board conducted a detailed evaluation of the curriculum, with particular focus on academic progression, relevance to current industry needs, and alignment with program outcomes.

The Course Structure for IV-B.Tech is attached in the Annexure-II

BoS/2026/CSE(DS)/4	Discussion and Finalization of Syllabus for IV -B.Tech. under R23 Regulations

Resolution:

During the discussion in the Board of Studies, Dr. B. R. Chandavarkar , Associate Professor, NITK, Surathkal recommended the following points:

- It was suggested to allot a faculty guide/mentor to each student during the internship period for continuous monitoring and academic support.
- The BoS members also recommended allowing the respective company/industry to assess the performance of the students during the internship based on their work, participation, and learning outcomes.

Dr. R. Rajasekhar Professor Dept. of CSE, JNTUA, Anantapuramu, recommended the following point

- It was proposed to replace the Professional Elective Course with a MOOC course as per the directions and current academic requirements.

BoS/2026/CSE(DS)/5	To approve the list of examiners for IV-B.Tech courses/subjects

Resolution:

BOS Approved the List of Examiners for IV-B.Tech Courses/Subjects.

The list of Examiners is attached in the Annexure-IV

BoS/2026/CSE(DS)/6	Any other item with permission of the Chair

Resolution:

NIL

Dr. P Phanindra Kumar Reddy
Chairman-BoS- CSE(DS),
AITS, Rajampet.

Head of the Department
Artificial Intelligence & Data Science
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(Autonomous)
RAJAMPET-516126, Annamayya Dist.

Internal Members:

1. Dr. P Phanindra Kumar Reddy -
2. Mr. S Ashok Kumar -
3. Mr. B Venkatesu Goud -

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Artificial Intelligence and Data Science, Computer Science & Engineering (Data Science)

Date: 08-06-2026

Following are the list of B.o.S members attended to 19th Board of Studies meeting held on 08-06-2026 in the in Online Mode, Microsoft teams for the departments of **Artificial Intelligence & Data Science, Computer Science and Engineering(Data Science)**, AITS, Rajampet.

S.No.	Name of the Member	Account Details	Present/Absent
1	**Ex-officio Dr. P Phanindra Kumar Reddy** Associate Professor & Head Dept. of AI&DS, A.I.T.S. Rajampet.	Internal Members	**Present**
2	**Internal Member** **Mr. S Ashok Kumar** Assistant Professor, Dept. of AI&DS, A.I.T.S, Rajampet.		
3	**Internal Member** **Mr. B Venkatesu Goud** Assistant Professor, Dept. of AI&DS, A.I.T.S, Rajampet.		
4	**Outside Subject Expert** **Dr. V C Bharathi**, Professor, VIT-AP University, Amaravati, Andhra Pradesh, India Phone:+91 96007 08416, Email:bharathi.vc@vitap.ac.in	Indian Bank Account details: Acco.No: 735353495 Name: V.C.Bharathi Bank name: Indian Bank Branch name: AEC, Tiruvannamalai,Tamilnadu IFSC Code: IDIB000A127	**Absent**
5	**Outside Subject Expert** **Dr. B. R. Chandavarkar,** Associate Professor, NITK,Surathkal E-mail: brc@nitk.edu.in, brcnitk@gmail.com Telephone: 0824- 2473408	Bank: SBI, Branch: NITK, Name: B R Chandavarkar, Acc. No.: 30293116030, IFSC: SBIN0002273.	**Present**
6	**University Nominee** **Dr. R. Rajasekhar** Professor Dept. of CSE, JNTUA, Anantapuramu Ph. 9966660226. Mail: drasharaj2002@gmail.com	Details Submitted to office	**Present**
7	**Industry Expert:** **Varun Kumar Reddy Gangu,** Designation: Software Architect Company Name: ICE data services Email id: varunkumarreddy.gangu@ice.com Mobile: +91 7674946949	Bank: SBI Branch: BHEL TOWNSHIP HYDERABAD Name: Varun Kumar Reddy Gangu Account No.: 62248649611 IFSC: SBIN0020075	**Present**
8	**Alumni Member:** **B. Krishna Reddy,** Mobile: +91 6302272347, Email: soulkittu6666@gmail.com	Bank: HDFC Branch: NGO COLONY CUDDAPAH Name: BOVILLA KRISHNA REDDY Account No.:50100666280208 IFSC:HDFC0008162	**Present**

HoD – AI&DS

BoS Chairman

Head of the Department
Artificial Intelligence & Data Science
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
Autonomous
RAJAMPET-516 126.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
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Title of the Course : Business Ethics And Corporate Governance
Category : HSMC
Course Code : 23AHS7AT
Year : IV B.Tech I Semester (Common to CE, MECH, ECE, EEE, CSE & Allied Branches)

Course Objectives:

- To enable them in knowing about the ethics in management
- To understand the ethics in different functional areas
- To facilitate the student' role in corporate culture
- To impart knowledge about the fair-trade practices
- To encourage the student in knowing about the corporate governance

Unit 1 Ethics

Introduction–Meaning–Nature, Scope, significance, Loyalty, and ethical behavior.. Value systems - Business Ethics - Types, Characteristics, Factors, Contradictions and Ethical Practices in Management –Corporate Social Responsibility– Issues of Management – Crisis Management.

Unit 2 ETHICS IN MANAGEMENT

Introduction – Ethics in production, finance, Human resource management and Marketing Management –The Ethical Value System – Universalism, Utilitarianism, Distributive Justice, Social Contracts, Individual Freedom of Choice, Professional Codes; Culture and Ethics – Ethical Values in different Cultures - Culture and Individual Ethics – professional ethics and technical ethics.

Unit 3 CORPORATE CULTURE

Introduction - Meaning, definition, Nature, and significance – Key elements of corporate culture, shared values, beliefs and norms, rituals, symbols and language - Types of corporate culture, hierarchical culture, market driven culture – Organization leadership and corporate culture, leadership styles and their impact on culture, transformational leadership and culture change.

Unit 4 LEGAL FRAME WORK

Law and Ethics -Agencies enforcing Ethical Business Behavior -Legal Impact – Environmental Protection, Fair Trade Practices, legal Compliances, Safeguarding Health and wellbeing of Customers – Corporate law, Securities and financial regulations, corporate governance codes and principles.

Unit 5 E-Marketing

Introduction - Meaning– Corporate governance code, transparency & disclosure -Role of auditors, board of directors and shareholders. Global issues, accounting and regulatory frame work – Corporate scams – Committees in India and abroad, corporate social responsibility. Bo Ds composition, Cadbury Committee –Various committees - Reports- Benefits and Limitations.

Prescribed Textbooks:

1. Murthy CSV: Business Ethics and Corporate Governance, HPH July 2017
2. Bholananth Dutta, S.K. Podder – Corporation Governance, VBH. June 2010

Reference Books:

1. Dr. K. Nirmala, Karunakara Readdy. *Business Ethics and Corporate Governance*, HPH
2. H.R. Machiraju: *Corporate Governance*, HPH, 2013
3. K.Venkataramana, *Corporate Governance*, SHBP.
4. N.M. Khandelwal. *Indian Ethos and Values for Managers*

Course Outcomes:

At the end of the course, the student will be able to	Blooms Level of Learning
1. Understand the Ethics and different types of Ethics.	L2
2. Summarize the ethics in different functional areas of management.	L2
3. Comprehend the beliefs and norms of ethics in management.	L2
4. Analyze the corporate law, ethics, codes &principles	L3
5. Evaluate corporate governance & corporate scams.	L4

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	PSO1	PSO2
23AHS7AT - 1	1	1	1	1	-	-	3	1	1	-	1	-	-
23AHS7AT - 2	1	1	-	1	-	-	2	1	1	1	1	-	-
23AHS7AT - 3	1	1	1	1	-	1	2	1	1	-	1	-	-
23AHS7AT - 4	1	2	-	1	-	-	2	1	2	-	1	-	-
23AHS7AT - 5	1	-	1	1	1	-	1	1	1	-	-	-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET
(An Autonomous Institution)

Title of the Course : E-Business
Category : HSMC
Course Code : 23AHS7BT
Year : IV B. Tech. I Semester (Common to CE, MECH, ECE, EEE, CSE & Allied Branches)

Course Objectives:

- To provide knowledge on emerging concept on E-Business related aspect.
- To understand various electronic markets & business models.
- To impart the information about electronic payment systems & banking.
- To create awareness on security risks and challenges in E-commerce.
- To the students aware on different e-marketing channels & strategies

Unit 1 ELECTRONIC BUSINESS

Introduction – Nature, meaning, significance, functions and advantages - Definition of Electronic Business - Functions of Electronic Commerce (EC)-Advantages & Disadvantages of ECommerce – E-Commerce and E-Business, Internet Services, Online Shopping- E-Commerce Opportunities for Industries.

Unit 2 ELECTRONIC MARKETS AND BUSINESS MODELS

Introduction –E-Shops-E-Malls E-Groceries - Portals - Vertical Portals-Horizontal Portals - Advantages of Portals - Business Models- Business to Business (B2B)-Business to Customers(B2C) - Business to Government(B2G)-Auctions-B2B Portals in India

Unit 3 ELECTRONIC PAYMENT SYSTEMS

Introduction to electronic payment systems (EPS) -Types of electronic payments - Credit/debit cards, e-wallets, UPI, and crypto currencies -Smart cards and digital wallets: Features and usage -Electronic Fund Transfer (EFT): Role in business transactions -Infrastructure requirements and regulatory aspects of e-payments

Unit 4 E-SECURITY

Security risks and challenges in electronic commerce - Cyber threats - Phishing, hacking, identity theft, and malware - Digital Signatures & Certificates - Security protocols over public networks (HTTP, SSL, TLS) -Firewalls in securing e-business platforms.

Unit 5 E-MARKETING

Introduction – Online Marketing – Advantages of Online Marketing – Internet Advertisement – Advertisement Methods – Conducting Online Market Research– – E-marketing planning: Online branding, social media marketing, and email marketing - E-business strategies: Digital advertising, content marketing, and analytics – E-Customer Relationship Management (eCRM) E-supply chain management (e-SCM).

Prescribed Textbooks:

1. Arati Oturkar&Sunil Khilari. E-Business. Everest Publishing House, 2022
2. P.T.S Joseph. E-Commerce, Fourth Edition, Prentice Hall of India, 2011

Reference Books:

1. Debjani, Kamalesh K Bajaj. E-Commerce, Second Edition Tata McGraw-Hill‘s, 2005
2. Dave Chaffey.E-Commerce E-Management, Second Edition, Pearson, 2012.
3. Henry Chan. E-Commerce Fundamentals and Application, RaymondLeathamWiley India, 2007
4. S. Jaiswal. E-Commerce GalgotiaPublication Pvt Ltd., 2003.

Course Outcomes

At the end of the course, the student will be able to	Blooms Level of Learning
1. Describe E-Business & its nature, scope and functions	L2
2. Understand E-market-Models which are practicing by the organizations.	L2
3. Analyze the various E-payment systems & importance of net banking.	L4
4. Comprehend importance of E-security & control.	L2
5. Evaluate market research strategies & E-advertisements.	L5

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	PSO1	PSO2
23AHS7BT - 1	2	-	-	-	2	-	-	-	-	2	-	-	-
23AHS7BT -2	2	-	-	-	2	-	-	-	-	-	-	-	-
23AHS7BT -3	-	3	3	-	2	-	-	-	-	-	-	-	-
23AHS7BT -4	-	-	-	-	2	3	2	-	-	-	2	-	-
23AHS7BT -5	2	3	-	-	2	-	-	-	-	3		-	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: RAJAMPET
(An Autonomous Institution)

Title of the Course : Management Science
Category : HSMC
Course Code : 23AHS7CT
Year : IV B. Tech. I Semester (Common to CE, MECH, ECE, EEE, CSE & Allied Branches)

Course Objectives:

- To provide fundamental knowledge on Management, Administration, Organization & its concepts.
- To make the students understand the role of management in Production
- To impart the concept of HRM in order to have an idea on Recruitment, Selection, Training & Development, job evaluation and Merit rating concepts
- To create awareness on identify Strategic Management areas & the PERT/CPM for better Project Management
- To make the students aware of the contemporary issues in modern management

Unit 1 INTRODUCTION TO MANAGEMENT

Management - Concept and meaning - Nature-Functions - Management as a Science and Art and both. Schools of Management Thought - Taylor‘s Scientific Theory-Henry Fayol‘s principles - Elton Mayo‘s Human relations - Organizational Designs - Line organization - Line & Staff Organization - Functional Organization - Matrix Organization - Project Organization - Committee form of Organization - Social responsibilities of Management.

Unit 2 OPERATIONS MANAGEMENT

Principles and Types of Plant Layout - Methods of Production (Job, batch and Mass Production), Work Study - Statistical Quality Control- Material Management - Objectives - Inventory-Functions - Types, Inventory Techniques - EOQ-ABC Analysis - Marketing Management - Concept - Meaning - Nature-Functions of Marketing - Marketing Mix - Channels of Distribution - Advertisement and Sales Promotion - Marketing Strategies based on Product Life Cycle.

Unit 3 HUMAN RESOURCES MANAGEMENT (HRM)

HRM - Definition and Meaning – Nature - Managerial and Operative functions - Job Analysis - Human Resource Planning(HRP) - Employee Recruitment-Sources of Recruitment - Employee Selection - Process - Employee Training and Development - methods - Performance Appraisal Concept - Methods of Performance Appraisal – Placement - Employee Induction - Wage and Salary Administration

Unit 4 STRATEGIC & PROJECT MANAGEMENT

Definition& Meaning - Setting of Vision - Mission - Goals - Corporate Planning Process - Environmental Scanning - Steps in Strategy Formulation and Implementation - SWOT Analysis - Project Management - Network Analysis - Programme Evaluation and Review Technique (PERT) - Critical Path Method (CPM) Identifying Critical Path - Probability of Completing the project within given time - Project Cost- Analysis - Project Crashing (Simple problems).

Unit 5 CONTEMPORARY ISSUES IN MANAGEMENT

Customer Relations Management(CRM) - Total Quality Management (TQM) - Six Sigma Concept - Supply Chain Management(SCM) - Enterprise Resource Planning (ERP) - Performance Management – employee engagement and retention - Business Process Re-engineering and Bench Marking - Knowledge Management – change management –sustainability and corporate social responsibility.

Prescribed Textbooks:

1. Frederick S. Hillier, Mark S. Hillier. Introduction to Management Science, October 26, 2023

Reference Books:

1. A.R Aryasri, Management Science, TMH, 2019
2. Stoner, Freeman, Gilbert.Management, Pearson Education, New Delhi, 2019.
3. Koontz &Weihrich, Essentials of Management, 6/e, TMH, 2005.
4. Thomas N.Duening& John M.Ivancevich, Management Principles and Guidelines, Biztantra.
5. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2004.
6. Samuel C.Certo, Modern Management, 9/e, PHI, 2005

Course Outcomes:

Student will be able to	Blooms Level of Learning
1.Summarize management concepts, functions, principles, and organizational structures.	L2
2. Analyze operations and marketing management techniques in business situations.	L4
3. Apply human resource management functions for effective workforce management.	L3
4. Apply strategic and project management tools for organizational planning.	L3
5. Comprehend contemporary management practices for improving organizational performance.	L2

CO-PO Mapping:

Course Outcomes	Engineering Knowledge	Problem Analysis	Design/Development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	PSO1	PSO2
23AHS7CT - 1	2	1	–	–	–	2	1	2	2	2	1	-	-
23AHS7CT - 2	2	2	2	1	1	1	2	1	2	2	3	-	-
23AHS7CT - 3	1	2	1	–	–	2	–	2	3	2	2	-	-
23AHS7CT - 4	2	3	2	2	2	1	1	2	2	2	3	-	-
23AHS7CT - 5	1	2	2	1	2	3	3	3	2	2	2	-	-