SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (AUTONOMOUS)
(Approved by AICTE, New Delhi, Affiliated to JNTUK, Kakinada)
Accredited by NAAC with 'A+' Grade
Recognised as Scientific and Industrial Research Organisation
SRKR MARG, CHINA AMIRAM, BHIMAVARAM – 534204, W.G.Dt., A.P., INDIA

Prof. M. Jagapathi Raju
M.Tech (IIT, KGP), Ph.D (A.U), FIE, MISTE
PRINCIPAL

Estd. 1980

Phones: 08816-223332 Ext. 201
Direct: 08816-222748
Mobile No's.: 9848773515, 9848381818
Email: principal@srkrec.ac.in
principalsrkrec@gmail.com
Website: www.srkrec.ac.in

PROCEEDINGS OF THE PRINCIPAL

Date: 12-09-2023

Ref. No: SRKREC/Committee/BoS/ME/5

Sub: Appointment of BoS members for Mechanical Engineering (ME) department-Reg.

The following members are nominated as Board of Studies members for the Department of Mechanical Engineering. This order will come into force with immediate effect until further orders.

S.No	Name	Position in the committee	Associated with
1	Dr. P.Rama Murthy Raju	Chairman	Professor& Head Dept. of Mechanical Engineering SRKR Engineering College
2	Dr. M.Kumara Swamy	JNTUK Nominee	Associate Professor of Mechanical Engg, University College of Engineering Kakinada (UCEK), JNTU Kakinada
3	Prof. G. Ravi Kiran Sastry	Subject Expert from outside the Parent University	Professor Dept. of Mechanical Engineering National Institute of Technology Andhra Pradesh Tadepalligudem, Andhra Pradesh
4	Prof.K.Venkata Subbaiah	Subject Expert from outside the Parent University	Professor & Head Dept. of Mechanical Engineering College of Engineering (A), Andhra University Visakhapatnam.
5	Dr. P.V.S.Ganesh Kumar	Representative from Research Laboratory	Associate Director Naval Science & Technological Laboratory (NSTL) Visakhapatnam, Andhra Pradesh.
6	Sri. G. Bhanu Prasad	Representative from Industry	Founder & GM Operations, PMI Toolings Pvt. Ltd., Hyderabad
7	Sri. Sateesh L V R K Ponnada	Postgraduate meritorious Alumni	Senior Simulation Engineer, CADFEM India, Somajiguda, Hyderabad.
8	Dr. K.Brahma Raju	Faculty Representatives	Professor, Dept. of Mechanical Engineering, SRKREC
9	Dr.V.Durga Prasada Rao		Professor, Dept. of Mechanical Engineering, SRKREC
10	Dr. K.Suresh Babu		Professor, Dept. of Mechanical Engineering, SRKREC
11	Dr. K.V.M.Krishnam Raju		Professor, Dept. of Mechanical Engineering, SRKREC
12	Dr.V.K.Viswanadha Raju		Professor, Dept. of Mechanical Engineering, SRKREC
13	Dr. S.Rajesh		Professor, Dept. of Mechanical Engineering, SRKREC

S.R.K.R. ENGINEERING COLLEGE Pin: 534 204 BHIMAVARAM

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W.G.Dist., Andhra Pradesh

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14	Dr. K.Sita Rama Raju		Professor, Dept. of Mechanical Engineering, SRKREC
15	Dr. A.Bala Krishna		Professor, Dept. of Mechanical Engineering, SRKREC
16	Sri Ch.Srinivas		Associate Professor Dept. of Mechanical Engineering, SRKREC
17	Sri Ch. GopalaRaju		Associate Professor, Dept. of Mechanical Engineering, SRKREC
18	Sri P.V.R.S. Padma Raju		Associate Professor, Dept. of Mechanical Engineering, SRKREC
19	Sri G. Chatapathi Raju		Associate Professor, Dept. of Mechanical Engineering, SRKREC
20	Dr. Ch. Rama Bhadri Raju		Associate Professor, Dept. of Mechanical Engineering, SRKREC
21	Gedi Jagadeesh (22B91D0402)	9182052211	M.Tech. Student saijagadeeshjd110@gmail.com
22	Kattunga Jagadeesh Sai (20B91A0390)	9508707695	4/4 B.Tech Student jagadeeshsai9177@gmail.
23	Dangeti Sri Sai Supreeth (21B91A0338)	7780753859 Student Representatives	3/4 B.Tech Student supreeth112899@gmai
24	Pakala Saiteja (22B95A0333)	6281446784	3/4 B.Tech Student pakalasaiteja503@gmail
25	Androthu Raju (22B91A0302)	9121683446	2/4 B.Tech Student androthuraju@gmail.com

PRINCIPAL

c.c.to:

1. Principal's table
2. HOD Mech. Engg. . 3. All the above Members 4. Dean Academics Office.

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CHINNA AMIRAM :: BHIMAVARAM-534204
DEPARTMENT OF MECHANICAL ENGINEERING

Dt: 15-09-2023

CIRCULAR

This is to inform you that the Department of Mechanical Engineering has scheduled a 12thBoard of Studies meeting on 16-09-2023 at 10:00 AM in blended mode (both offline and using zoom virtual meeting platform). In this connection all the Board of Studies members are requested to attend the same.

Agenda:

1. To discuss and finalize the course structure and syllabus for 1/4 B.Tech. Mechanical Engineering program under R23 Regulations.
2. Any other item with the permission of the chair.

Head of the Department

Professor & Head
Dept. of Mechanical Engg.
S.R.K.R. Engineering College
CHINA AMIRAM (P.O.)
BHIMAVARAM-534 204.

Gmail

Mechanical Department <hodmechsrkr@gmail.com>

Intimation of Department of Mechanical Engineering Board of Studies Meeting on 16.09.2023 at 10:00 AM-Online Mode @ S.R.K.R. Engineering College (A)-Reg.

1 message

Mechanical Department <hodmechsrkr@gmail.com> Fri, Sep 15, 2023 at 10:14 AM
To: "ganeshkumar.pvs ganeshkumar.pvs" <ganeshkumar.pvs@nstl.drdo.in>

Dear Sir,

Sub: S.R.K.R. Engineering College- Department of Mechanical Engineering-Board of Studies Meeting-Reg.

We take the privilege in inviting you for the Board of Studies Meeting of the Department of Mechanical Engineering, SRKR Engineering College as subject expert other than parent university.

You are requested to attend the online meeting scheduled on 16-09-2023 (Saturday) at 10.00 AM. by using the following online ZOOM meeting link.

https://us05web.zoom.us/j/83212822512?pwd=Z7jIVAJUdQSUuqsFqFoHHiwVSEtgsj.1

Kindly accept our invitation and make it convenient to attend the Board of Studies meeting.

Proposed Syllabus for 1/4 B.Tech. under R23 regulations are enclosed for your kind reference.

Thanking you,

Professor & Head
Dept. of Mechanical Engg.
S.R.K.R. Engineering College
CHINA AMIRAM (P.O.)
BHIMAVARAM-534 204.

Yours Sincerely,
Dr. P. RAMA MURTY RAJU
Professor & Head,
Department of Mechanical Engineering
S.R.K.R. Engineering College (A)
China Amiram, Bhimavaram,
West Godavari District
Andhra Pradesh-534204
Mobile No. : 9440519992

ProposedFirstYearCourses&Syllabus(R23).pdf
234K

Gmail

Mechanical Department <hodmechsrkr@gmail.com>

Intimation of Department of Mechanical Engineering Board of Studies Meeting on 16.09.2023 at 10:00 AM-Online Mode @ S.R.K.R. Engineering College (A)-Reg.

1 message

Mechanical Department <hodmechsrkr@gmail.com> Fri, Sep 15, 2023 at 10:13 AM
To: "Prof. GRK" <grksastry@nitandhra.ac.in>

Dear Sir,

Sub: S.R.K.R. Engineering College- Department of Mechanical Engineering-Board of Studies Meeting-Reg.

We take the privilege in inviting you for the Board of Studies Meeting of the Department of Mechanical Engineering, SRKR Engineering College as subject expert other than parent university.

You are requested to attend the online meeting scheduled on 16-09-2023 (Saturday) at 10.00 AM. by using the following online ZOOM meeting link.

https://us05web.zoom.us/j/83212822512?pwd=Z7jlVAJUdQSUuqsFqFoHHiwVSEtgsj.1

Kindly accept our invitation and make it convenient to attend the Board of Studies meeting.

Proposed Syllabus for 1/4 B.Tech. under R23 regulations are enclosed for your kind reference.

Thanking you,

Yours Sincerely,
Dr. P. RAMA MURTY RAJU
Professor & Head,
Department of Mechanical Engineering
S.R.K.R. Engineering College (A)
China Amiram, Bhimavaram,
West Godavari District
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Mechanical Department <hodmechsrkr@gmail.com>

Intimation of Department of Mechanical Engineering Board of Studies Meeting on 16.09.2023 at 10:00 AM-Online Mode @ S.R.K.R. Engineering College (A)-Reg.

1 message

Mechanical Department <hodmechsrkr@gmail.com> Fri, Sep 15, 2023 at 10:11 AM
To: "Prof.K.Venkatasubbaiah" <drkvsau@yahoo.co.in>

Dear Sir,

Sub: S.R.K.R. Engineering College- Department of Mechanical Engineering-Board of Studies Meeting-Reg.

We take the privilege in inviting you for the Board of Studies Meeting of the Department of Mechanical Engineering, SRKR Engineering College as subject expert other than parent university.

You are requested to attend the online meeting scheduled on 16-09-2023 (Saturday) at 10.00 AM. by using the following online ZOOM meeting link.

https://us05web.zoom.us/j/83212822512?pwd=Z7jIVAJUdQSUuqsFqFoHHiwVSEtgsj.1

Kindly accept our invitation and make it convenient to attend the Board of Studies meeting.

Proposed Syllabus for 1/4 B.Tech. under R23 regulations are enclosed for your kind reference.

Thanking you,

P. Rama Murty Raju
Professor & Head
Dept. of Mechanical Engg.
S.R.K.R. Engineering College
CHINA AMIRAM (P.O.)
BHIMAVARAM-534 204.

Yours Sincerely,
Dr. P. RAMA MURTY RAJU
Professor & Head,
Department of Mechanical Engineering
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West Godavari District
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Mobile No. : 9440519992

ProposedFirstYearCourses&Syllabus(R23).pdf
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Mechanical Department <hodmechsrkr@gmail.com>

Intimation of Department of Mechanical Engineering Board of Studies Meeting on 16.09.2023 at 10:00 AM-Online Mode @ S.R.K.R. Engineering College (A)-Reg.

1 message

Mechanical Department <hodmechsrkr@gmail.com> Fri, Sep 15, 2023 at 10:07 AM
To: Kumaraswamy Mokenapalli <kmpalli12@gmail.com>

Dear Sir,

Sub: S.R.K.R. Engineering College- Department of Mechanical Engineering-Board of Studies Meeting-Reg.

We take the privilege in inviting you for the Board of Studies Meeting of the Department of Mechanical Engineering, SRKR Engineering College as a University Nominee.

You are requested to attend the online meeting scheduled on 16-09-2023 (Saturday) at 10.00 AM. by using the following online ZOOM meeting link.

https://us05web.zoom.us/j/83212822512?pwd=Z7jIVAJUdQSUuqsFqFoHHiwVSEtgsj.1

Kindly accept our invitation and make it convenient to attend the Board of Studies meeting.

Proposed Syllabus for 1/4 B.Tech. under R23 regulations are enclosed for your kind reference.

Thanking you,

P. Rama Murty Raju
Professor & Head
Dept. of Mechanical Engg.
S.R.K.R. Engineering College
CHINA AMIRAM (P.O.)
BHIMAVARAM-534 204.

Yours Sincerely,
Dr. P. RAMA MURTY RAJU
Professor & Head,
Department of Mechanical Engineering
S.R.K.R. Engineering College (A)
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Mobile No. : 9440519992

ProposedFirstYearCourses&Syllabus(R23).pdf
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MINUTES OF THE MEETING

Twelve 12th Board of studies meeting in blended mode (Both offline & virtual using zoom platforms) was held on & 16-09-2023 (Saturday) in CAD Lab-2 of Mechanical Engineering Department at 10:00 AM in order to discuss the following items:

1. Discussion and finalization of course structure and syllabus of I/IV B.Tech Mechanical Engineering program ~~as~~ under R23 Regulations.

MINUTES OF THE MEETING RESOLUTIONS

1. Feedbacks collected from various stake holders like students, alumni, employers and parents has been discussed while designing the course structure and syllabus for I/4 B.Tech (R23) Mechanical Engineering programs.

2. Finalized the course structure and syllabus for I/4 B.Tech (R23) Mechanical Engineering Program.

48 MEMBERS PRESENT

S.NO.	Name of the Member	Designation	Signature
01.	Dr. M. KUMAR SWAMY	JNTUK, UCE, KAKINADA	
02	Dr. K V M K Raju	Professor	
03	Dr. P. R. M. Raju	Professor & HOD	
04	Dr K. Brahmaji Raju	Professor	
5	C. SRINIVAS	Associate professor	ch. Srinivas
6	CH. Gopala Raju	Associate Prof.	CH.G.Raju
7.	Dr. ch. Rama Bhadri Raju	Associate professor	
8.	G. Chakrapani Rao	Associate Professor	
9.	Dr. K. Suresh Babu	Professor	
10	S. RAJESH	professor	
11.	Dr. V. DURGA PRASAD	Professor	Prasad
12.	Dr. V.K. VISWANADHA RAJU	Professor	
13	P.V.R.S.PADMA RAO	Associate Professor	
14.	Prof. G.R.K. SASTRY	Professor, NITAP	
15.	D. Sri sai Supreeth - 21B91A0338	B. Tech - 3/4 student	Supreeth
16.	P. Sai Teja - 22B95A0333	3/4 Btech	P. Sai Teja.
17	A. Raju - 22B91A0302	2/4 B. Tech	

RESOLUTIONS FOR THE MEETING DATED 16-09-2023

Feedbacks collected from various stake holders like students, alumni, employers and parents has been discussed while designing the course structure and syllabus for I/4 B.Tech (R22) Mechanical Engineering program.

S.R.K.R ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING
CHINA AMIRAM: BHIMAVARAM – 534204

Feedback Analysis 2022-23

A feedback on the curriculum is obtained from students, *employers*, faculty and alumni. After study of the feedback form various stake holders some important points of the feedback are identified.

Total 157 feedback forms have been obtained from various stake holders.

The following are the key points obtained from the study of the feedback:

1. Students should be trained to explore and understand emerging technologies
2. All round development of the interpersonal and communicational skills to be encouraged
3. Students need a course/Lab on MATLAB
4. More hands on experience to be provided to students to link theory with practice
5. According to the competence outside we can increase thive e depth of the syllabus. It may loads the students but increases the standards.
6. Need more focus on quality than quantity.
7. Need to include a mini project in the curriculum.
8. Provide time for sports.
9. Can add python language in first year
10. Introduce software courses in every semester
11. Include industrial tours in the curriculum.
12. Put more programming courses as elective subjects
13. Include new technolgies in the syllabus
14. Library stock should be increased

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2. Finalized the course structure and syllabus for I/IV B.Tech (R23) Mechanical Engineering Program.

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Regulation: R23	I / IV - B.Tech. I - Semester

MECHANICAL ENGINEERING

SCHEME OF INSTRUCTION & EXAMINATION
(With effect from 2023-24 admitted Batch onwards)

Course Code	Course Name	Category	L	T	P	Cr	C.I.E.	S.E.E.	Total Marks
B23HS1101	Communicative English	HS	2	0	0	2	30	70	100
B23BS1101	Linear Algebra & Calculus	BS	3	0	0	3	30	70	100
B23BS1106	Engineering Chemistry	BS	3	0	0	3	30	70	100
B23CE1101	Basic Civil & Mechanical Engineering	ES	3	0	0	3	30	70	100
B23ME1101	Engineering Graphics	ES	2	0	2	3	30	70	100
B23IT1101	IT Workshop	ES	0	0	2	1	30	70	100
B23HS1102	Communicative English Lab	HS	0	0	2	1	30	70	100
B23BS1107	Engineering Chemistry Lab	BS	0	0	2	1	30	70	100
B23ME1102	Engineering Workshop	ES	0	0	3	1.5	30	70	100
B23HS1104	Health and wellness, Yoga and sports	HS	-	-	1	0.5	100	0	100
			13	0	12	19	370	630	1000

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Regulation: R23	I / IV - B.Tech. II - Semester

MECHANICAL ENGINEERING

SCHEME OF INSTRUCTION & EXAMINATION
(With effect from 2023-24 admitted Batch onwards)

Course Code	Course Name	Category	L	T	P	Cr	C.I.E.	S.E.E.	Total Marks
B23BS1201	Differential Equations & Vector Calculus	BS	3	0	0	3	30	70	100
B23BS1202	Engineering Physics	BS	3	0	0	3	30	70	100
B23EE1201	Basic Electrical and Electronics Engineering	ES	3	0	0	3	30	70	100
B23ME1203	Engineering Mechanics	PC	3	0	0	3	30	70	100
B23CS1201	Introduction to Programming	ES	3	0	0	3	30	70	100
B23BS1204	Engineering Physics Lab	BS	0	0	2	1	30	70	100
B23EE1202	Electrical and Electronics Engineering Workshop	ES	0	0	3	1.5	30	70	100
B23ME1204	Engineering Mechanics lab	PC	0	0	3	1.5	30	70	100
B23CS1202	Computer Programming Lab	ES	0	0	3	1.5	30	70	100
B23HS1203	NSS/NCC/Scouts & Guides/Community Service	HS	-	-	1	0.5	100	0	100
			15	0	12	21	370	630	1000

PART B: BASIC MECHANICAL ENGINEERING

Course Objectives:

1.	Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.
2.	Explain different engineering materials and different manufacturing processes.
3.	Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

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

S.No	Outcome	Knowledge Level
1.	**Apply** the use of engineering materials and importance of Mechanical Engineering in diverse sectors and industries.	K3
2.	**Apply** the Working of basic thermal engineering systems and different manufacturing processes.	K3
3.	**Illustrate** the basic operation of power plants and fundamentals of different mechanical power transmission systems, robotics, and their applications.	K3

SYLLABUS

UNIT-I (8 Hrs)	**Introduction to Mechanical Engineering:** Role of Mechanical Engineering in Industries and Society- Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. **Engineering Materials** - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart materials.
UNIT-II (8 Hrs)	**Manufacturing Processes:** Principles of Casting, Forming, joining processes, Machining, Introduction to CNC machines, 3D printing and Smart manufacturing. **Thermal Engineering** – Working principle of Cochran and Babcock & Wilcox Boilers, Working of basic principle of domestic refrigerator and air-conditioner, IC engines classification-2-Stroke, 4-Stroke, SI/CI Engines, Introduction to Hybrid and Electric Vehicles.
UNIT-III (8 Hrs)	**Power plants** – Working principle of Steam, Diesel, Nuclear power plants. **Mechanical Power Transmission** - Belt Drives, Chain, Rope drives, Gear Drives and their applications. **Introduction to Robotics** - Joints & links and applications of robotics.

(**Note**: The course covers only the **basic principles** of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the **fundamentals** of the course)

Textbooks:

1.	An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.
2.	G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

Reference Books:

1.	Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I
2.	3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
3.	Elements of Workshop Technology Vol-I by S.K Hajra Choudhury &Nirjhar Roy, MPP Pvt. Ltd.
4.	Thermal Engineering by R K Rajput, Laxmi Publications Pvt. Ltd.
5.	Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.
6.	Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.
7.	Material science &Metallurgy by O.P.Khanna, Dhanpat Rai Publications
8.	Electric and Hybrid Vehicles by A K.Babu, Khanna books, 2nd Edition
9.	A course in Power Plant Engineering /Arora and Domkundwar/Dhanpatrai& Co.

e-Resources

1.	https://onlinecourses.nptel.ac.in/noc23_me78/preview?use
2.	https://onlinecourses.nptel.ac.in/noc23_me101/preview?user

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Course Code	Category	L	T	P	C	C.I.E	S.E.E	Exam
B23ME1101	ES	2	–	2	3	30	70	3 Hrs

ENGINEERING GRAPHICS

(Common to CE, ECE, EEE, ME)

Course Objectives:

1. To bring awareness that Engineering drawing is the language of engineers
2. To impart basic knowledge and skills required to prepare Engineering drawings.
3. To develop the Engineering imagination essential for successful design.

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

S.No	Outcomes	Knowledge Level
1.	Utilize the fundamentals of drawing to Sketch polygons and engineering curves.	K3
2.	**Apply** principles of Orthographic projections to **Draw** the projections of points and lines.	K3
3.	Utilize the fundamentals of Orthographic projections to **Draw** the projections of planes.	K3
4.	Utilize the fundamental principles of Orthographic projections to **Sketch** projections of three-dimensional objects.	K3
5.	**Apply** principles of drawing to **Construct** sectional views and pictorial views of simple solids.	K3

SYLLABUS

UNIT-I (10Hrs)	**Geometrical Constructions and Engineering Curves:** **Introduction** to Engineering Drawing, Lines, Lettering and Dimensioning, Geometrical Constructions and Constructing regular polygons by general methods. **Engineering Curves:** Parabola, Ellipse and Hyperbola by general method (Eccentricity method only), Cycloidal curves, Involutes, tangent & normal for these curves.
UNIT-II (10Hrs)	**Orthographic Projections:** Introduction to orthographic projection, Projections of a point situated in any one of the four quadrants. **Projections of Straight Lines:** Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to the other reference plane, inclined to one reference plane and parallel to the other reference plane. Projections of Straight line inclined to both reference planes.
UNIT-III (10Hrs)	**Projections of planes**: Regular planes perpendicular to one reference plane and parallel to other, planes perpendicular to one reference plane and inclined to the other reference plane; planes inclined to both the reference planes.

UNIT-IV (10Hrs)	**Projections of Solids:** Types of solids- Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane and Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.
UNIT-V (10Hrs)	**Sections of Solids:** Sections and Sectional views of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone – and True shape of section. **Isometric Projection:** Introduction to Isometric projection and Isometric projection of simple Right and Regular Solids – Prism, Cylinder, Pyramid and Cone. **Computer graphics**: Creating 2D&3D drawings of objects and Transformations using Auto CAD (Not for end examination).

Text Books:

1. Engineering Drawing by N D Bhatt, Charotar Publications.
2. Engineering Drawing– K Venugopal, V. Prabhu Raja, New Age

Reference Books:

1. Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers.
2. Engineering Graphics for Degree by K.C. John, PHI Publishers.
3. Engineering Graphics by PI Varghese, McGrawHill Publishers.
4. Engineering Drawing by Agarwal & Agarwal, Tata McGraw Hill Publishers

e-Resources:

1. https://nptel.ac.in/courses/112103019/
2. https://nptel.ac.in/courses/112104172/1

Course Code	Category	L	T	P	C	C.I.E.	S.E.E.	Exam
B23ME1102	ES	–	–	3	1.5	30	70	3 Hrs.

ENGINEERING WORKSHOP

(Common for AIDS, AIML, CE, CSBS, CSG, CIC & ME)

Course Objectives:

1. To familiarize students with Wood working, Fitting & Sheet metal operations.
2. To acquire basic knowledge on tools and equipment used in Foundry, Arc welding, plumbing, etc.

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

S.No	Outcome	Knowledge Level
1.	**Observe** safety precautions, select suitable tools and **practice** on preparing various components in Wood working & Fitting Trades.	K3
2.	**Analyze** the dimensions to be marked and prepare the sheet metal components.	K4
3.	**Examine** the tools and equipment used in Foundry & Arc welding methods.	K3
4.	**Choose** various tools and accessories to prepare pipe joints, change of two-wheeler tyre etc....	K3

SYLLABUS

1.	Demonstration and explanation of **Safety practices and precautions** to be observed in workshop.
2.	**Wood Working:** Familiarity **with** different types of **woods and tools** used in wood carpentry and make following joints. a) Corner halving Joint b) Dovetail halving joint c) Mortise & Tenon Joint
3.	**Fitting:** Familiarity with different types of tools used in fitting and do the following fitting exercises. a) Triangular fit b) Rectangular fit c) Semi-circular fit
4.	**Sheet Metal Working:** Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal job from GI sheets. a) Straight pipe b) Square tray c) Frustum of cone
5.	**Foundry Trade:** Demonstration on Moulding tools and processes, Preparation of Green Sand Moulds for given Patterns.
6.	**Welding Shop**: Demonstration on Arc Welding method and Preparation of Lap joint and Butt joint.
7.	**Plumbing:** Demonstration and practice of Plumbing tools, Preparation of pipe joints with coupling for same diameter and with reducer for different diameters.
8.	Demonstration on Bicycle tire puncture and change of two-wheeler tyre.

Text Books:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published, 2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015
2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A., Atul Prakashan, 2021-22.

PRINCIPAL
S.R.K.R. Engineering College(A)
China Amiram, Bhimavaram - 534 204.
W.G.Dist., Andhra Pradesh

Professor & Head
Dept. of Mechanical Engg.
S.R.K.R. Engineering College
CHINA AMIRAM (P.O.)
BHIMAVARAM-534 204.

Course Code	Category	L	T	P	C	C.I.E.	S.E.E.	Exam
B23ME1203	PC	3	--	--	3	30	70	3 Hrs.

ENGINEERING MECHANICS

(Common to CE & ME)

Course Objectives:

1. To know the effect of force and moment in the different engineering applications.
2. To impart the knowledge about center of gravity and moment of inertia of solids and surfaces.
3. To familiarize Trusses and frictional forces in mechanical applications.
4. To learn fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems.
5. To learn concepts of kinematics and kinetics of rigid bodies under dynamic conditions

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

S. No	Outcome	Knowledge Level
1.	**Solve** for the resultant of the given force systems & **Analyze** force systems using equations of equilibrium.	K4
2.	**Determine** centroid, center of gravity and moment of inertia of areas and bodies.	K3
3.	**Analyze** the forces of the members in trusses and **solve** problems on frictional force.	K4
4.	**Apply** the General equation of motion principles to solve the problems of rectilinear and curvilinear motion of a particle.	K3
5.	**Determine** the displacement, velocity and acceleration relations and **apply** the kinetics on rigid bodies	K3

SYLLABUS

UNIT-I (10Hrs)	**Introduction to Engineering Mechanics**– Basic Concepts - Scope and Applications **System of Forces:** Force, Specification of force - Resultant of Force Systems - Coplanar Concurrent Forces–Free Body Diagrams, Lami's Theorem, Equations of Equilibrium of Coplanar Systems -Moment of a force - Couple- Varignon's Theorem
UNIT-II (10 Hrs)	**Parallel Force System:** Equilibrium Conditions- Concept of Centroid - Centroid of simple figures - Centroid of Composite Figures. **Centre of Gravity:** Centre of gravity of simple body (from basic principles), Centre of gravityof composite bodies, Pappus theorems. **Area Moments of Inertia:** Definition - Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, **Mass Moment of Inertia:** Moment of Inertia of Masses - Standard Shapes- Transfer Formula for Mass Moments of Inertia

UNIT-III (10 Hrs)	**Equilibrium of Systems of Forces:** General case of Force system - Analysis of plane trusses, Method of Joints and Method of Sections for plane trusses- Principle of Virtual Work with simple examples **Friction:** Introduction, limiting friction and impending motion, Coulomb's laws of dry friction,coefficient of friction, Application of Friction - wedge and ladder friction.
UNIT-IV (10 Hrs)	**Rectilinear and Curvilinear motion of a particle** Kinematics and Kinetics – Equation of motion - D'Alembert's Principle - Work Energy method and applications to particle motion-Impulse Momentum method – Central Impact – Coefficient of Restitution
UNIT-V (10 Hrs)	**Rigid body Motion:** Kinematics and Kinetics of Rotation about fixed axis - Equation of Motion - Work Energy method and Impulse Momentum method- Basics of Plane Motion

Textbooks:

1. Engineering Mechanics, S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., McGraw Hill Education 2017. 5th Edition.
2. Engineering Mechanics: Statics and Dynamics; A.K.Tayal

Reference Books:

1. Engineering Mechanics: Statics and Dynamics, Hibbeler R.C., Pearson Education, Inc., New Delhi, 2022, 14th Edition
2. A Textbook of Engineering Mechanics, S.S Bhavikatti, New age international publications 2018. 4th Edition.
3. Engineering Mechanics, Statics and Dynamics, I.H. Shames., PHI, 2002. 4th Edition.
4. Engineering Mechanics, Volume-I: Statics, Volume-II: Dynamics, J. L. Meriam and L.
5. G. Kraige., John Wiley, 2008. 6th Edition.
6. Introduction to Statics and Dynamics, Basudev Battachatia, Oxford University Press, 2014. Second Edition
7. Engineering Mechanics, Statics and Dynamics, Rogers and M.A. Nelson., McGraw Hill Education. 2017. First Edition.

e-Resources :

1. https://nptel.ac.in/courses/112103109/
2. https://nptel.ac.in/courses/112103108/
3. https://nptel.ac.in/courses/122104014/

Course Code	Category	L	T	P	C	C.I.E.	S.E.E.	Exam
B23ME1204	PC	--	--	3	1.5	30	70	3 Hrs.

ENGINEERING MECHANICS LAB

(For ME)

Course Objectives:

1. Verify the Law of Parallelogram and Triangle of Forces.
2. Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.
3. Analize the system of Pulleys and Moment of Inertia of Compound Pendulum and Flywheel.

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

S.No	Outcome	Knowledge Level
1.	**Apply** Law of Polygon of forces and Law of Moment using force polygon and bell crank lever.	K3
2.	**Evaluate** the coefficient of friction between two different surfaces and between the inclined plane and the roller.	K4
3.	**Apply** the equilibrium conditions of a rigid body under the action of different force systems.	K3
4.	**Determine** the Centre of gravity and Moment of Inertia of different configurations.	K3

SYLLABUS

1. Verification of Law of Parallelogram of Forces.
2. Verification of Law of Triangle of Forces.
3. Verification of the Law of polygon for coplanar-concurrent forces acting on a particle in equilibrium and to find the value of unknown forces considering particle to be in equilibrium using universal force table.
4. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever.
5. Determination of coefficient of Static and Rolling Frictions
6. Verification of the conditions of equilibrium of a rigid body under the action of coplanar non-concurrent, parallel force system with the help of a simply supported beam.
7. Study of the systems of pulleys and draw the free body diagram of the system.
8. Determine the acceleration due to gravity using a compound pendulum.
9. Determination of Centre of Gravity of different shaped Plane Lamina.
10. Determine the Moment of Inertia of a Flywheel.
11. Determine the Moment of Inertia of the compound pendulum about an axis perpendicular to the plane of oscillation and passing through its center of mass.

Text Books:

1. S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., Engineering Mechanics, 5th Edition, McGraw Hill Education.
2. Hibbeler R.C., Engineering Mechanics: Statics and Dynamics, 14th Edition, Pearson Education, Inc., New Delhi, 2022

Reference Books:

1. Engineering Mechanics: Statics and Dynamics; N H Dubey, McGraw Hill Education
2. Engineering Mechanics: Statics and Dynamics; A.K.Tayal

P. Ramanuja Rao

Professor & Head
Dept. of Mechanical Engg.
S.R.K.R. Engineering College
CHINA AMIRAM (P.O.)
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M. Jagapathi Raju

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