



# **Sri Vasavi Engineering College (Autonomous)**

**(Sponsored by Sri Vasavi Educational Society)**

(Approved by AICTE, New Delhi & Permanently affiliated to JNTUK, Kakinada)

(Accredited by NBA & NAAC with 'A' Grade, Recognized by UGC Under Section 2(f) & 12(B))

**Pedatadepalli, Tadepalligudem, W.G.Dt, A.P-534101**

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## **Department of Mechanical Engineering**

### **Agenda of the 4<sup>th</sup> BOS meeting of the department on 30-12-2020**

#### **Item No.1**

Review and approval of course structure of I & II semesters of B. Tech (ME) under V20 Regulations

#### **Item No.2**

Approval of syllabi for the Mechanical Engineering courses offered in I & II semesters B. Tech under V20 Regulation.



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## **Department of Mechanical Engineering**

**Date:30-12-2020**

Fourth meeting of BOS in Mechanical Engineering department along with external members is held on 30/12/2020 at 10.00 AM in online mode through Zoom platform in view of COVID-19 pandemic.

**The following members are present.**

<b>S. No</b>	<b>Name of the BOS Members</b>
1.	Dr.N. Mohan Rao, Professor & Director (IIPT & SDC) JNTUK, Kakinada
2.	Dr. R.V. Chalam, Professor, NIT, Warangal
3.	Dr. A. Krishnaiah, Professor, Osmania University, Hyderabad
4.	Sri S.S. Subramanya Sastry, Director - Projects, Renprotech Solutions Pvt. Ltd., Bangalore.
5.	Sri A.Sai Krishna, Alumni, Maruthi design and engg. Pvt.ltd ,Bangalore
6.	Dr. G.V.N.S.R. RatnakaraRao, Professor & Principal, SVEC
7.	Dr. M.V. Ramesh, Chairman & HOD, SVEC
8.	All the BOS internal members



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## **Department of Mechanical Engineering**

### **Minutes of meeting of 4<sup>th</sup> BOS held on 30.12.2020**


Chairman welcomed all the BOS members and introduced to all the BOS internal members.

**Item No. 1: Review and approval of course structure of I & II semesters of B. Tech (ME) under V20 Regulations.**

- The approved course structure is attached in **Annexure-I**.

**Item No. 2: Approval of syllabi for the Mechanical Engineering courses offered in I & II semesters B. Tech under V20 Regulation.**

- The approved syllabi for the courses are attached in **Annexure-II**.

  
Chairman (Head -ME)  
Head of the Department  
Mechanical Engineering  
Sri Vasavi Engineering College  
TADAPALLIGUDEM-534101

## Annexure - I

### Course Structure of Mechanical Engineering – V20 Regulation (For 2020 – 2021 Admitted Batch)

#### I SEMESTER

S.No	Course Code	Course Title	Hours per week			
			L	T	P	C
1	V20MAT01	Linear Algebra and Differential Equations	3	0	0	3
2	V20PHT01	Engineering Physics	3	0	0	3
3	V20ENT01	English for Professional Enhancement	3	0	0	3
4	V20MET01	Engineering Graphics	1	0	4	3
5	V20CST01	Programming in C for problem solving	3	0	0	3
6	V20ENL01	Hone Your Communications Skills Lab-I	0	0	3	1.5
7	V20PHL01	Engineering Physics Lab	0	0	3	1.5
8	V20CSL01	Programming lab in C for problem solving	0	0	3	1.5
9	V20CHT02	Environmental Studies	2	0	0	0

Total Contact Hours: 28 Total Credits: 19.5

#### II SEMESTER

S.No	Course Code	Course Title	Hours per week			
			L	T	P	C
1	V20MAT02	Numerical Methods and Vector Calculus	3	0	0	3
2	V20CHT01	Engineering Chemistry	3	0	0	3
3	V20MET02	Engineering Mechanics	3	0	0	3
4	V20EET02	Basic Electrical and Electronics Engineering	3	0	0	3
5	V20MEL01	Engineering Workshop	1	0	4	3
6	V20EEL02	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5
7	V20CHL01	Engineering Chemistry Lab	0	0	3	1.5
8	V20ENL02	Hone Your Communications Skills Lab-II	0	0	3	1.5

Total Contact Hours: 26 Total Credits: 19.5

## Annexure - II

### I Semester

#### Syllabi for the Mechanical Engineering courses offered in I & II semesters B. Tech under V20 Regulation

<b>V20MEL01</b>	<b>ENGINEERING GRAPHICS</b> (Common to All Branches)	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>1</b>	<b>0</b>	<b>4</b>	<b>3</b>

	After successful completion of the course, the student will be able to:	Knowledge Level
CO1	Understand the basic commands in CAD Software and draw the conic sections	K3
CO2	Construct different types of scales and special curves	K3
CO3	Draw the projections of the points and lines	K3
CO4	Develop the projections of planes and surfaces of regular solids	K3
CO5	Draw the Isometric projections and conversion of views	K3

#### **UNIT – I**

**INTRODUCTION TO CAD SOFTWARE:** CAD Software Mechanical Desktop, Draw, Modify, Dimension tool bars, Annotations, Layers, ISI conventions in drawing.

**CONIC SECTIONS** – Ellipse, Parabola and Hyperbola

#### **UNIT– II**

**SPECIAL CURVES & SCALES:** Special Curves – cycloid, epicycloids, hypocycloid; Scales – Plain, Diagonal and Vernier Scales.

#### **UNIT– III**

**ORTHOGRAPHIC PROJECTIONS:** Introduction to Orthographic Projections- Projections of Points, Projection of lines inclined to both the planes.

#### **UNIT– IV**

**PROJECTION OF PLANES :** Inclined to both the Planes.

**PROJECTION OF REGULAR SOLIDS :** Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the planes, Development of Surfaces of regular solids.

#### **UNIT– V**

**ISOMETRIC PROJECTIONS:** Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple solids.

Conversion of Isometric Views to Orthographic Views and Vice-versa.

**TEXT BOOKS:**

1. Engineering Drawing by N.D. Bhat, Chariot Publications, 53rd Edition-2014
2. Engineering Drawing by Agarwal&Agarwal, Tata McGraw Hill Publishers, 2<sup>nd</sup> Edition-2016

**REFERENCE BOOKS:**

1. Engineering Drawing by K.L.Narayana& P. Kanniah, Scitech Publishers, 2<sup>nd</sup> Edition-2014
2. Engineering Graphics for Degree by K.C. John, PHI Publishers-2014
3. Engineering Graphics by PI Varghese, McGrawHill Publishers-2013
4. Engineering Drawing AutoCad – K Venugopal, V. Prabhu Raja, New Age, 5<sup>th</sup> Edition-2015

## II Semester

<b>V20MET01</b>	<b>ENGINEERING MECHANICS</b> Common to CE &ME	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Course Outcomes:** After successful completion of the course, the student will be able to

CO1	Compute the resultant force of a given system of forces and understanding of concepts on friction.	K3
CO2	Calculate the forces in the different types of plane trusses	K3
CO3	Find the Centroid, Center of Gravity and Moment of Inertia for plane figures and bodies	K3
CO4	Illustrate the different types of plane motions of a particle to compute its velocity, acceleration and force.	K3
CO5	Illustrate the concept of Work and Energy and apply the principle of Virtual Work to stability of equilibrium of Ladder	K3

### **UNIT – I**

Introduction to Engineering Mechanics – Basic Concepts.

**SYSTEMS OF FORCES:** Coplanar Concurrent Forces – Resultant – Moment of Force and its Application – Couples and Resultant of Force Systems.

**EQUILIBRIUM OF SYSTEMS OF FORCES:** Free Body Diagrams, Equations of Equilibrium of Coplanar Systems for concurrent forces. Lami's Theorem, Graphical method for the equilibrium of coplanar forces, Converse of the law of Triangle of forces, converse of the law of polygon of forces condition of equilibrium.

**FRICITION:** Introduction, Limiting friction and impending friction, ladder and wedge friction.

### **UNIT – II**

**ANALYSIS OF TRUSSES BY METHOD OF JOINTS:** Types of Trusses - Assumptions for forces in members of a perfect truss, Force table, Cantilever Trusses, Structures with one end hinged and the other freely supported on rollers carrying horizontal or inclined loads.

### **UNIT – III**

**CENTROID:** Centroid of simple figures (from basic principles) – Centroid of Composite Figures Centre of Gravity: Centre of gravity body (from basic principles), centre of gravity of composite bodies, Pappus theorems.

**MOMENT OF INERTIA OF PLANE FIGURES:** I-section, T-section, Channel section, Z-section and L-section & other composite sections.

### **UNIT – IV**

**KINEMATICS:** Rectilinear and Curvilinear motions – Velocity and Acceleration – Motion of Rigid Body – Types and their Analysis in Planar Motion.

**KINETICS:** Analysis as a Particle and Analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies.

## **UNIT – V**

**WORK – ENERGY METHOD:** Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion. Impulse momentum method.

**PRINCIPLE OF VIRTUAL WORK:** Principle of virtual work, advantages of principle of virtual work, principle of virtual applied to stability of equilibrium. Application of principle of virtual work limited to ladder problems.

### **TEXT BOOKS:**

1. Engineering Mechanics by A.K.Tayal ,Umesh Publications.
2. Engineering Mechanics, Ferdinand . L. Singer, Harper – Collins.
3. Engineering Mechanics, S.S Bhavikatti, K. G. Rajashekarappa. New Age International publication.

### **REFERENCE BOOKS:**

1. Engg.Mechanics - S.Timoshenko&D.H.Young., 4th Edn - , McGraw Hill publications.
2. Theory & Problems of engineering mechanics, statics & dynamics – E.W.Nelson, C.L.Best& W.G. McLean, 5th Edn – Schaum’s outline series - McGraw Hill Publ.
3. Meriam J. L., Kraige L. G., “Engineering Mechanics – Dynamics”, Wiley Student Edition, (Sixth Edition) reprint 2011.
4. Beer F. P., Johnston E. R., “Vector Mechanics for Engineers Statics and Dynamics”, Tata, McGraw Hill Publishing company Ltd., New Delhi (Eighth Edition) reprint 2009
5. Shames Irving H., “Engineering Mechanics”, Prentice Hall, New Delhi (Fourth edition) reprint 2009.



## II Semester

<b>V20MEL01</b>	<b>ENGINEERING WORKSHOP (Common to All Branches)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>1</b>	<b>0</b>	<b>4</b>	<b>3</b>

Course Outcomes:

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

CO1	Prepare different models in the carpentry trade and understand basic concepts of carpentry	K3
CO2	Develop various basic prototypes in the trade of Tin smithy and understand basic concepts of Tin smithy.	K3
CO3	Prepare various basic prototypes in the trade of fitting and understand basic concepts of fitting.	K3
CO4	Prepare different models in the Black smithy and understand basic concepts of Black smithy.	K3
CO5	Develop various basic House Wiring techniques, Electrical wiring circuits	K3
CO6	Develop various basic prototype models in Welding and Foundry shop.	K3

### Module-I

#### **General safety Considerations during operation of:**

Bench Tools, Hammers, Screw Drivers, Punches, Chisels, Scrapers, Scribers, Files, Pliers and Cutters, Wrenches, Hacksaw, Bench Vise, Hand drill, Taps and Dies, Hand Shears, Rules, Tapes and Squares, Soldering Iron, Rivets.

#### **Hand Working Operations:**

Sawing, Filing, Threading, Scribing, Shearing, Soldering, Sharpening of hand tools.

Measuring and Gauging:

Calipers, depth Gauge, Feeler Gauge, Micrometers, Vernier Calipers, Vernier Height Gauge, Snap Gauge, Hole Gauge, Bevel Protractor, Dial Indicator, Gauge Blocks and Surface Plate

### Module-II

#### **Carpentry:**

Introduction, Carpentry Tools, Marking and Layout, Operations.

#### **Sheet Metal Works :**

Introduction, Sheet Metal Tools, Marking and Layout, Operations – Bending, Cutting, Rolling.

#### **Fitting :**

Introduction, Fitting Tools, Marking and Layout, Operations.

#### **Forging :**

Introduction , Forging Tools ,Operations – Upsetting, Drawing, Cutting, Bending, Punching ,Forging Presses and Hammers.

#### **House wiring:**

Introduction, House wiring Tools and accessories, Connections, Circuit diagrams.

**Metal Joining:**

Safety Considerations, Introduction, Soldering, Brazing, Welding – Gas Welding, Arc Welding,

**Foundry:**

Introduction, Pattern Making, Foundry Tools, Core Making, Melting Furnace – Cupola, Sand Casting Process.

**Module-III**

Note: At least two exercises to be done from each.

**Carpentry**

1. T-Lap Joint
2. Cross Lap Joint
3. Dovetail Joint
4. Mortise and Tenon Joint

**Tin Smithy**

1. Taper Tray
2. Square Box without lid
3. Open Scoop
4. Funnel

**Fitting shop**

1. V- Fit
2. Square Fit
3. Half Round Fit
4. Dovetail Fit

**Black smithy**

1. Round rod to Square
2. S-Hook
3. Round Rod to Flat Ring
4. Round Rod to Square headed bolt

**House wiring**

1. Parallel / Series Connection of three bulbs
2. Stair Case wiring
3. Florescent Lamp Fitting
4. Measurement of Earth Resistance

**Welding shop (Arc welding)**

1. Butt Joint
2. Lap Joint

**Foundry Practice**

Preparation of sand mould using split piece pattern and cast the component.

**Text Books:**

1. A Course in Work shop Technology, Vol.1, Raghuwanshi, Dhanpat Rai & Co.
2. Elements of Workshop Technology, Vol.1, S.K.Hajra Choudary, Asia Publishing House.
3. Production Technology, Vol.1, R.K.Jain and S.C Gupta, Khanna Publications.
4. Workshop Practice Manual, K.Venkata Reddy, B.S.Publications.
5. Workshop Manual, P.Kannaiah, K.L.Narayana, Scitech Publications.

**Evaluation procedure:**

**Internal Lab Evaluation (30M):**

1. Day to Day Evaluation (15M): Practice (Minimum of 15 Exercises)
2. Lab Internal examination (10M)
3. Record evaluation (5M)

**External Lab Examination (70M):**

1. Experimental procedure (25M)
2. Experimentation (35M)
3. Viva voce (10M)