



ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪ ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)



VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994) "Jnana Sangama" Belagavi-590018, Karnataka, India]

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REGISTRAR

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REF: VTU/BGM/BOS/New UG-PG Prog/2023-24/4618

DATE:

5 DEC 2023

CIRCULAR

Subject: The syllabus of BMEL305-Introduction to Modelling and Design for Manufacturing is revised...

Reference: The email from Chairperson BoS Mechanical Engineering, VTU Belagavi dated 27.11.2023

The Hon'ble Vice Chancellors' approval dated 04.12.2023

The faculty development program has been conducted on the course/subject BMEL305: Introduction to Modelling and Design for Manufacturing between the 6th and 8th of November 2023 at 6 different places in Karnataka to cover the faculty of all zones of VTU Belagavi (ref. VTU/BGM/BOS/FDP/2023-24/3728, Dated October 31, 2023).

Based on the feedback received from the faculty, the syllabus of the course/subject **BMEL305: Introduction to Modelling and Design for Manufacturing** has been revised and submitted to the university for circulation to all concerned by the Board of Studies in Mechanical Engineering, VTU Belagavi.

A revised syllabus copy has been enclosed in this circular for stakeholder reference. The revised syllabus of the course will take effect in the academic year 2023-24 for Mechanical Engineering and its allied branches.

All the principals of the engineering colleges are hereby informed to bring the content of the circular to the notice of all concerned.

Sd/-
Registrar

To,

All the Principals of Affiliated /Constituent Engineering Colleges, under the University.

The Chairperson / Program Coordinator, University Department at Kalaburagai, Belagavi, Bengaluru and Mysuru

Copy to:

1. The Hon'ble Vice-Chancellor through the secretary to VC VTU Belagavi for information
2. The Registrar (Evaluation) VTU Belagavi for information and needful

3. The Director, ITI SMU, VTU Belagavi for information and request to make arrangements for uploading this circular on the VTU web portal in the section of Circular/Notification @ <https://vtu.ac.in/en/category/administration/>
4. The Chairperson/s Board of Studies in Mechanical Engineering and its allied branches
5. The Special Officer, QPDS Examination Section VTU Belagavi for needful.
6. Office Copy

R. ~~05/11/23~~ 05
REGISTRAR
05/11/23

Introduction to Modelling and Design for Manufacturing		Semester	3
Course Code	BMEL305	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	0:0:2:0	SEE Marks	50
Total Hours of Pedagogy	14 Sessions	Total Marks	100
Credits	01	Exam Hours	3
Examination nature (SEE)	Practical		
Course objectives:			
<ul style="list-style-type: none"> • Develop a comprehensive understanding of mechanical assemblies and design for manufacturing principles. • Learn and apply best practices to create designs that are robust, adaptable, and cost-effective. • Master the art of maintaining control over designs throughout the entire lifecycle, from initial sketch to final production. • Gain hands-on experience in practical exercises and projects to reinforce theoretical concepts. • Acquire effective communication and collaboration skills for multidisciplinary teamwork in design and production processes. 			
Teaching-Learning Process (General Instructions)			
These are sample strategies, which teachers can use to accelerate the attainment of the various course outcomes.			
<ul style="list-style-type: none"> • Project-Based Learning: Engage students in hands-on projects that simulate real-world design scenarios, enabling practical application of concepts and fostering deeper understanding. • Interactive Workshops: Conduct collaborative workshops where students work together to solve design challenges, encouraging active participation and knowledge sharing. • Design Reviews with Feedback: Regularly review student designs, providing constructive feedback to guide iterative improvement and promote attention to detail. • Industry Insights: Invite guest speakers from the industry to share experiences and insights, helping students connect theoretical knowledge to real-world applications. • Multidisciplinary Teams: Form diverse teams for group projects, allowing students to leverage different skill sets and perspectives to develop comprehensive designs. 			
Module-1		02 Sessions	
<p>Introduction to Computer Aided Sketching Review of graphic interface of the software. Review of 2D Sketching, Parametric Solid Modelling, Assembly creation and product rendering. Limits, Fits and Tolerances: Introduction, Fundamental tolerances, Deviations, Methods of placing limit dimensions, Types of fits with symbols and applications, Geometrical tolerances on drawings, Standards followed in industry. (Above topics to be studied as a review)</p> <p>Geometrical Dimensioning and Tolerances (GD&T): Introduction, Fundamental tolerances, Deviations, Methods of placing limit dimensions, machining symbols, types of fits with symbols and applications, geometrical tolerances on drawings. Standards followed in industry. (Only for CIE)</p> <p>The basics of sketching and modelling: Explore Fusion 360 User Interface, Navigation and display settings, create new projects and designs, creating basic 2D sketches, Creating & Modifying a solid 3D body with Sections. (For SEE)</p>			
Module-2		02 Sessions	
<p>Create draft during a feature, create draft as a feature, Add ribs and plastic supports, Create holes and threads. Thread Forms: Terminologies, ISO Metric, BSW, Square & Acme. Seller threads, American Standard Thread. Use a coil feature, Mirrors and patterns. Fasteners: 3D & Section views - Hexagonal headed bolt and nut with washer, Square headed bolt and nut with washer. Keys: Parallel Key, Taper Key & Feather Key.</p>			
Module-3		04 Sessions	
<p>The different ways to create components, Use scripts to create gears, Component color swatch and color cycling, Use McMaster-Carr parts in a design. Assembly of Joints and Coupling using 3D environment. Joints: Like Cotter joint (socket and spigot), knuckle joint (pin joint). Couplings: Like flanged coupling, universal coupling.</p>			

21-11-2023.



Module-4

06 Sessions

Assembly Drawings: (Part drawings shall be given) Drawing Basics-Detailing Drawings. Explode a 3D model for a drawing, Create a drawing sheet and views, Add geometry and dimensions to a drawing, Add GD & T text, BOM, tables and symbols, Place an exploded view, Edit a title block, Export to different file formats.

1. LIFTING DEVICE (Screw Jack)
2. BEARINGS (Plumber Block)
3. MACHINE TOOL COMPONENT (Machine Vice or Tailstock)
4. VALVES (Ram's Bottom Safety Valve)
5. IC ENGINE COMPONENTS (Piston or Connecting Rod)

Course outcome (Course Skill Set)

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

1. Create and modify a form-based design.
2. Use design tools for moulded parts.
3. Demonstrate proficiency in the setup and creation of a design.
4. Simulate the assembly of machine components in 3D environment.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE):

- CIE marks for the practical course is 50 Marks.
- CIE shall be evaluated for max marks 100. Marks obtained shall be accounted for CIE final marks, reducing it by 50%.
- CIE component should comprise of
 - Continuous evaluation of Drawing work of students as and when the Modules are covered.
 - At least one closed book Test covering all the modules on the basis of below detailed weightage.
 - *Weightage for Test and Continuous evaluation shall be suitably decided by respective course coordinators.*

Module	Max. Marks weightage	Evaluation Weightage in marks	
		Computer display & printout	Preparatory sketching
Module-1	15	10	05
Module-2	15	10	05
Module-3	30	20	10
Module-4	40	30	10
Total	100	70	30

Semester End Evaluation (SEE):

SEE marks for the practical course is 50 Marks.

- The duration of SEE is 03 hours. Questions shall be set worth of 3 hours
- SEE shall be conducted jointly by the two examiners (one internal and one external) appointed by the University.
- SEE shall be conducted and evaluated for maximum of 100 marks as shown in the table below. Marks obtained shall be accounted for SEE final marks, reducing it to 50 marks.
- Question paper shall be set jointly by both examiners and made available for each batch as per schedule.
- Evaluation shall be carried jointly by both the examiners.
- Scheme of Evaluation: To be defined by the examiners jointly and the same shall be submitted to the university along with question paper.

- One full question shall be set from each Modules as per the below table weightage details. **However, the student may be awarded full marks, if he/she completes solution on computer display without sketch**

Module	Max. Marks weightage	Evaluation Weightage in marks	
		Computer display & printout	Preparatory sketching
Module-1 or Module-2	20	15	05
Module-3	30	20	10
Module-4	50	40	10
Total	100	75	25

Suggested Learning Resources:

Books

Text Books:

1. K L Narayana, P Kannaiah, K Venkata Reddy, "Machine Drawing", New Age International, 3rd Edition. ISBN-13: 978-81-224-2518-5, 2006
2. N D Bhatt, "Machine Drawing", Charotar Publishing House Pvt. Ltd., 50th Edition, ISBN-13: 978-9385039232, 2014
3. Machine drawing by K R Gopalakrishna, Subhash Publication

Web links and Video Lectures (e-Resources):

- Learn Fusion 360 in 90 Minutes
<https://www.autodesk.com/certification/learn/course/learn-fusion-360-in-90-minutes>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

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