Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
gram Name: Bachelor of Technology (Textile Engineering)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BTMA401	BS	Statistics and Quality Control	60	20	20	-	-	3	1	-	4

Course Objective

1. *To provide the knowledge of statistical analysis of test data.*
2. *To provide knowledge of quality control chart.*
3. *To build up skill and ability for R and D work through statistical analysis.*

Course Outcomes

After the successful completion of this course students will be able to:

1. *demonstrate the knowledge for statistical analysis of test data.*
2. *make the quality control chart of the manufactured product.*
3. *identify and analyze the reason of defect through statistical analysis and use the knowledge in developing the product.*
4. *illustrate and discuss the sampling methods.*

Course Content:

UNIT – I
Collection and presentation of data, Measures of central tendency, Measures of variation, Skewness, Moments and kurtosis, Probability Theory, priori and posteriori probabilities, conditional probabilities Bay's theorem (Simple Problems).

UNIT – II
Probability distribution: discrete distribution, binomial, and poison distributions. Continuous Normal Distribution, Exponential Distribution, central value theorem, Normal Probability curve, calculation of mean and variance From Normal Curve, Practical usefulness of normal Distribution, sampling distribution, Bivariate Distribution, Correlation and Regression, Analysis of Variance, significance of error R2 (one way classification only).

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Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
gram Name: Bachelor of Technology (Textile Engineering)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BTMA401	**BS**	**Statistics and Quality Control**	60	20	20	-	-	3	1	-	4

UNIT – III

Elementary theory of testing of hypothesis, Statistical Hypothesis, Null Hypothesis, Errors of first and second kind, Critical Region, level of Significance. Chi-square test of goodness of fit Test of significance based on T, F and Z distribution.

UNIT – IV

General idea of sampling method, random sample, sampling size, sample size for different distribution, differences between average and variances.

UNIT – V

Statistical quality control chart, control limits, X, R, P, Pn chart etc., analysis by defects, number of defects (C chart), introduction to TQM and ISO 9000.

References:

- Gupta, Kapoor: Fundamental of Mathematical Statistics
- Booth J.E.: Textile Testing.
- SITRA : Application of statistics in textile.
- Grover B. & Hanby D. S.: Textile testing and Quality Control. Grant Eugene; Statistical Quality control; TMH

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B. Tech. (Common for All branches)

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment *	End Sem University Exam	Teachers Assessment*				
BTPH101	DC	Applied Physics	60	20	20	30	20	3	1	2	5

Course Objectives	1. To develop the comprehensive understanding of laws of physics. 2. To develop ability to apply laws of physics for various engineering applications. 3. To develop the experimental skills, ability to analyze the data obtained experimentally to reach substantiated conclusions.
Course Outcomes	1. Student will be able to comprehend laws of physics. 2. 2. Student will be able to apply laws of physics for various engineering applications. 3. 3. Student will be able to determine physical parameter experimentally and will be able to analyze the data obtained experimentally to draw substantiate conclusions.

Abbreviation		
Th	Theory	**Teacher Assessment (Theory) shall be based on following components: Quiz / Assignment/ Project / Participation in class (Given that no component shall be exceed 10 Marks).**
T	Tutorial	**Teacher Assessment (Practical) shall be based on following components: Viva / File / Participation in Lab work (Given that no component shall be exceed 50% of Marks).**
P	Practical	

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BTPH101: Applied Physics

UNIT I: Quantum Physics

Introduction to Quantum hypothesis, Matter wave concept, Wave Group and Particle velocity and their relations, Uncertainty principle with elementary proof and applications to microscope and single slit, Compton Effect, Wave function and its physical significance, Development of time dependent and time independent Schrodinger wave equation, Applications of time independent Schrodinger wave equation.

UNIT II: Solid State Physics

Free electron model, Qualitative Analysis of Kronig Penney Model, Effective mass, Fermi level for Intrinsic and Extrinsic semiconductors, P-N junction diode, Zener diode, Tunnel diode, Photodiode, Solar-cells, Hall Effect, Introduction to Superconductivity, Meissner effect, Type I & II Superconductors.

UNIT III: Nuclear Physics

Nuclear Structure & Properties Nuclear models: Liquid drop with semi-empirical mass formula & shell model. Particle accelerators: Cyclotron, Synchrotron, Betatron. Counters and Detectors: Giger-Muller counters, Bainbridge Mass Spectrograph and Auston Mass Spectrograph.

UNIT VI: Laser & Fiber Optics

Stimulated and Spontaneous Emission, Einstein's A&B Coefficients, Population Inversion, Pumping, Techniques of Pumping, Optical Resonator, Properties and Applications of Laser, Ruby, Nd:Y AG, He-Ne lasers. Introduction to Optical fibre, Acceptance angle and cone, Numerical Aperture, V-Number, Ray theory of propagation through optical fibre, Pulse dispersion, applications of optical fibre.

UNIT V: Wave Optics

Introduction to Interference, Fresnel's Bi-prism, Interference in Thin films, Newton's rings experiment, Michelson's interferometer and its application, Introduction to Diffraction and its Types, Diffraction at single slit, double slit, resolving power, Rayleigh criterion, Resolving power of grating, Concept of polarized light, Double refraction, quarter and halfwave plate, circularly & elliptically polarized light.

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BTPH101: Applied Physics

REFERENCES

1. "Engineering Physics", by Dr. S. L. Gupta and Sanjeev Gupta, Dhanpat Rai Publication, New Delhi.
2. "Engineering Physics", by Navneet Gupta, Dhanpat Rai Publication, New Delhi.
3. "Engineering Physics", by H. J Sawant, Technical Publications, Pune, Maharashtra.
4. "Engineering Physics". by MN. Avdhanulu & P. G. Kshirsagar, S. Chand & Co.Edition (2012).
5. "Fundamentals of Physics", by Halliday, Wiley, India.
6. "Concepts of Modern Physics", by Beiser, TMH, New Delhi.
7. "Atomic and Nuclear physics", by Brijlal and Subraminiyan.
8. "LASERSs and Electro Optics". by Christopher C. Davis, Cambridge Univ. Press (1996).
9. "Optoelectronics an Introduction", by J Wilson & JF.B.Hawkes, "" Prentice-Hall II Edition.
10. "LASER theory and applications", by A. K. Ghatak & Tyaga raja n, TMH (1984).

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BTPH101: Applied Physics

List of experiments

1. Measurement of radius of curvature "R" of convex lens by Newton's ring experiment.
2. Measurement of Numerical aperture of fiber by LASER.
3. Determination of Energy band gap .Eg" ofGe using Four Probe method.
4. Measurement of Frequency of A.C. mains by electrically maintained vibrating rod.
5. Measurement of Resolving Power of Telescope.
6. Measurement of "'A" of LASER light source using Diffraction Grating.
7. Determination of Planck's constant by using photocell.
8. Determination of Energy band gap (Eg) using PN Junction Diode.
9. To determine the mass of cane sugar dissolved in water using half shade polarimeter.
10. To study forward and reverse characteristics of Zener diode.
11. To study forward and reverse characteristics of P-N diode.
12. To study characteristics of Photo diode.
13. To study characteristics of LDR.
14. μ and ω of given prism using spectrometer.
15. Measuring height of a given object using Sextant.

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Choice Based Credit System (CBCS) in Light of NEP-2020
B.Tech. in Textile
(2023-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEI508		INSTRUMENTATION AND MEASUREMENT CONTROL	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To provide knowledge on the fundamentals of measuring instruments with common types of errors.
2. To provide a knowledge on the basics of control system theory
3. To introduce different types of sensors, transducers and strain gauges ,thermocouples, thermometers and flow meters used for measurements
4. To introduce measuring equipments used for linear and angular measurements.
5. To familiarize students with surface roughness measurements on machine components

Course Outcomes (COs):

Students will be able to

1. Understand measurement techniques and use of measuring instruments
2. knowledge for dealing with problems involving control system fundamentals
3. work in Quality control and quality assurances divisions in industries
4. Design a sensors and transducers used for analysis.
5. Design measuring equipments for the various Parameters.
6. Check and measure quality in engineering products.

Syllabus

UNIT I **7 Hrs.**

Basic concepts of measurements: Introduction, idea of a generalized measurement system, basic characteristics of measuring devices - accuracy, precision, error, hysteresis, resolution, threshold, repeatability, reliability, span, dynamic accuracy; calibration.

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B.Tech. in Textile
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COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEI508		INSTRUMENTATION AND MEASUREMENT CONTROL	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT II **7 Hrs.**

Transducer: Introduction, classification, basic requirements. Displacement measurement, Transformers: LVDT, RVDT, capacitive, shaft encoders, hall effect devices proximity devices. Strain gauge: basic principle, gauge factor, types of strain gauge, materials and their properties.

UNIT III **8 Hrs.**

Temperature Measurement: Temperature standards, Temperature scales,Thermometry based on thermal expansion, Liquid in glass thermometers, Bimetallic Thermometers, Electrical resistance thermometry: Resistance Temperature Detectors, Thermistors, Thermocouple.

UNIT IV **7 Hrs.**

Pressure and Velocity Measurement: Relative pressure scales, pressure reference instruments, barometer, manometer, deadweight tester, pressure gauges and transducers, total and static pressure measurement in moving fluids Flow measurement: Pressure differential meters: Orifice meter, Venturi meter, Rota meter.

UNIT V **9 Hrs.**

Introduction to control systems: Examples of control systems. Open loop and closed loop control. Transfer function, impulse response function, block diagram of closed loop system, and block diagram reduction, modeling of mechanical systems, modeling of electrical systems, signal flow graphs. Transient and steady state response analyses: First order systems, unit step and unit impulse response of first order systems, second order systems, unit step and unit Impusle response of second order system.

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEI508		INSTRUMENTATION AND MEASUREMENT CONTROL	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Text Books:

1. Metrology and Instrumentation – Swahney.
2. Instrumentation Measurement and Analysis; TMH, - Nakra B C and Chaudhary K K.
3. Instrumentation for Engineers and scientist;Oxford higher Ed - Turner J D and Hill M.

References:

1. Instrumentation & Control - Rangan, Mani & Sharma.
2. Transducers & Instrumentation - Murty.
3. Control Systems Engineering - Nagrath and Gopal.
4. Modern Control Engineering; 4e Pearson Education, New Delhi - Katsuhiko Ogata.

List of Experiments:

1. Detailed study of LVDT & Measurement of distance using LVDT.
2. Learning techniques of measurement of strain using strain gauge.
3. Observe and Analysis the characteristics of NTC thermistor.
4. To observe the water level measurement
5. To analysis the Resistance Temperature Detector.
6. Learning the techniques of measurement of temperature of thermocouple.
7. Learning the techniques of measurement of pressure and characteristics of pressure transducer.
8. To observe the dead weight pressure gauge.
9. To measure the distance using ultrasonic transducer.
10. Demonstration and performance of CRO.

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Choice Based Credit System (CBCS) Scheme in light of NEP-2020

B. Tech/B.Tech+MBA in Mechanical Engineering

(2023-2027) Revised Syllabus

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME105	BEC	FUNDAMENTALS OF MECHANICAL ENGINEERING AND APPLIED MECHANICS	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
The objective of the course is to develop basic knowledge of **(A)** engineering materials **(B)** thermodynamics, I.C. engines & boilers **(C)** Forces and Equilibrium **(D)** centroid & moments of inertia.

Course Outcomes:
After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

1. Student would be able to understand the need of engineering materials and its properties.
2. Student would be able to understand the basics of thermodynamics and boilers.
3. Student would be able to understand working principle of IC engines.
4. Students will be able to demonstrate various types of forces and their analysis.
5. Students will be able to calculate the centre of gravity and moment of inertia of different geometrical shaped figures.

Syllabus:

UNIT I **(8 Hrs)**

Introduction to Engineering Materials: Introduction, Classification of Engineering Materials, Mechanical properties like strength, hardness, toughness, ductility, brittleness, malleability etc. of materials, Tensile Test-Stress-strain diagram of ductile and brittle materials, Hooks law and modulus of elasticity, Hardness, and Impact testing of materials, BHN etc.

UNIT II **(9 Hrs)**

Thermodynamics: Thermodynamic system, properties, state, process, Zeroth, First and second law of thermodynamics, thermodynamic processes at constant pressure, volume, enthalpy & entropy.

Steam & Boilers: Formation of steam, steam processes, classification and working of boilers, mountings and accessories of boilers, efficiency and performance analysis of boilers, height of chimney.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME105	BEC	FUNDAMENTALS OF MECHANICAL ENGINEERING AND APPLIED MECHANICS	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III **(8 Hrs)**

IC Engines: Working principle of IC Engine, Terminology of IC engine, Carnot, Otto, and Diesel cycles P-V & T-S diagrams and its efficiency, working of two stroke & four stroke Petrol & Diesel engines.

Unit - IV **(10 Hrs)**

Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and non-concurrent, Co- planner forces, free Diagram, Force Diagram and Bow's notations, Types of supports and their reactions. Analysis of plane Trusses: Method of joints, Method of Sections. Frictional forces in equilibrium problems.

UNIT V **(10 Hrs)**

Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes. Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple.

Text and Reference Books:

1. "Basic Mechanical Engineering" by Dr. V. M. Domkundwar and S. S. Bhavikatti, Nirali Prakashan, 2018.
2. "Mechanical Engineering" by R.K. Rajput, S. Chand & Co. Delhi, 2019.
3. "An Introduction to Mechanical Engineering" by Jonathan Wickert and Kemper Lewis, CENGAGE Learning, 2012.
4. "Engineering Mechanics" by Shames and Rao, Pearson Edu(I), 2005.
5. "Engineering Mechanics (Statics & Dynamics)" by R.C. Hibler, Pearson Edu(I), 2015.
6. "A Text book of Applied Mechanics" by R.K. Rajput, Laxmi Pub. 2016.
7. "A Textbook of Engineering Mechanics" by R K Bansal, Laxmi Pub. 2005.

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B. Tech/B.Tech+MBA in Mechanical Engineering

(2023-2027) Revised Syllabus

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME105	BEC	FUNDAMENTALS OF MECHANICAL ENGINEERING AND APPLIED MECHANICS	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

List of Experiments:

1. To perform tensile test, plot the stress- strain diagram and evaluate the tensile property of a given specimen.
2. Study of different IC Engines.
3. Study of various types of Boilers.
4. Study of different types of Boilers Mountings and accessories.
5. Problems relating to centroid of composite areas.
6. Problems on moment of inertia, polar moment of inertia, radius of gyration, polar radius of gyration of composite areas.
7. Problems involving frictional forces.
8. Analysis of simple trusses by method of joints, method of sections & graphical method.
9. Problems on shear force and bending moment diagrams.

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Choice Based Credit System (CBCS) Scheme in light of NEP-2020

B. Tech/B.Tech+MBA in Mechanical Engineering

(2023-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME103	BEC	WORKSHOP PRACTICES	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
To paraphrases with (A) workshop technology, industrial safety, and understand material properties. (B) Carpentry shop, fitting shop, (C) welding and casting.

Course Outcomes:
After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

1. Student would be able to understand the need of workshop, technology related to it, and industrial safety and precautions.
2. Student would be able to use carpentry tools, analyses various wood joints and their properties.
3. Students would be able to use fitting tools to make various shapes and design.
4. Student would be able to recognize various welding techniques and their needs.
5. Students would be able to design various shapes by using casting technologies.

Syllabus:

UNIT I **(6 Hrs)**

Introduction to Workshop Technology & Industrial Safety:

Workshop Technology: Introduction, need of workshop and types of workshop

Industrial Safety- Introduction, objective of industrial safety, causes of accidents, common sources of accidents, preventive measures, and common safety methods.

UNIT II **(6 Hrs)**

Carpentry Shop:

Introduction, types of timbers, defects in timbers, timber prevention, characteristics of good timber, common tools used in carpentry shop (marking and measuring tools; cutting tools and striking tools), and common wood joints (cross-lap, corner-lap, dovetail and bridle joints).

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME103	BEC	WORKSHOP PRACTICES	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III **(6 Hrs)**

Fitting Shop:

Introduction, tools used in fitting shop (measuring tools, holding tools, cutting tools, striking tools and supporting tools) and operation performed in fitting work.

UNIT IV **(6 Hrs)**

Welding Shop:

Introduction, terminological elements of welding process, welding joints (lap joints and butt weld joint), welding positions, advantages and disadvantages of welding, classification of welding, gas welding processes and safety recommendation for gas welding.

UNIT V **(6 Hrs)**

Casting:

Pattern making and sand casting, Pattern materials, Types of pattern, Pattern allowances. Core prints. Moulding sand, ingredients, classification, sand additives, properties of moulding sand, sand preparation and testing. Green sand mould preparation. Cores and core making – Types of cores.

Text and Reference Books:

1. "Workshop Technology (Part-I)" by W.A.J. Chapman, CBS Pub, 2001.
2. "Production Technology (Vol-I)" by R.K. Jain, Khanna Publishers, 19th ed. 2019.
3. "Principles of Manufacturing Material & Process" by J.S. Campbell McGraw Hill, 1984.
4. "Welding: Principles & Practices" by Edward R. Bonhart, McGraw Hill Edu. India
5. "Welding and Welding Technology" by Richard L. Little, McGraw Hill, 2017.
6. "Principles of Foundry Technology" by P.L. Jain, McGraw Hill, 2017.
7. "Manufacturing Technology (Vol-I)" by P. N. Rao, McGraw Hill, 2017.
8. "Workshop Technology (Vol-I)" by B.S. Raghuvanshi, Dhanpat Rai & Co. 2015.

List of Experiments:

1. To study various industrial safety precautions & preventive measures.
2. To study the various timber properties, its defects and its prevention.
3. To make various joints (L-joint, T-joint, Cross joint, etc.) using carpentry tools.

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Shri Vaishnav Institute of Technology and Science

Choice Based Credit System (CBCS) Scheme in light of NEP-2020

B. Tech/B.Tech+MBA in Mechanical Engineering

(2023-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTME103	BEC	WORKSHOP PRACTICES	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

4. To perform various fitting shop operations using fitting tools.
5. To study various welding methods and its safety precaution.
6. To make various welding joints (Butt joints, Lap, joints, corner joints, etc).
7. To study various types of patterns and pattern allowances.
8. To study properties of moulding sand and prepare a mould.
9. To study various types of cores and its application in casting.

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Shri Vaishnav Institute of Textile Technology
Choice Based Credit System (CBCS) in Light of NEP-2020
B. Tech. in Textile Engineering (168 Credit_2024-2028)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTTX 200	DCC	FUNDAMENTALS OF TEXTILE INDUSTRY AND PROCESSES	60	20	20	-	-	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
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Course Educational Objectives (CEOs):

1. Develop a comprehensive understanding of the textile industry, its products, and its impact in a global scenario.
2. Develop a comprehensive understanding of textile technology, including fiber, yarn, and fabric.
3. Develop knowledge of different textile processes of the industries.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. The students will be able to

1. Identify different textile fibres.
2. Understand the properties of textile fibres.
3. Analyse the application of each textile fibre.
4. Understand the overall view of textile industries.

Syllabus

Unit I Introduction to Textile Fibers **9 h**

Definition - staple fibre and filament - monofilament and multifilament; Classification - natural fibers and man-made fibres, Properties – essential and desirable properties. General fiber characteristics (length, strength, flexibility, spin-ability, uniformity, density, luster, moisture - content and regain, elasticity, elastic recovery, elongation, tenacity, water repellant fibres, resiliency, compressibility, thermal and electrical conductivity, birefringence, Effect of acid and alkalis, etc.).

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Unit II Natural Fibers **9 h**

Production sequence and cultivation of natural fibers -Vegetable fibres: cotton, types of cotton fibers and their usage; Bast fibres: flax and jute; Animal fibres: silk and wool. Natural fibres – qualities, limitations, and recent developments.

Unit III Manmade Fibers **10 h**

Regenerated Fibres- Viscose Rayon, Acetate Rayon, Lyocell, and Bamboo fibres; Regenerated fibers - modification, qualities, and limitation.
Synthetic Fibers - Polyester, Nylon, Acrylic, Polypropylene and Elastane fibres; Synthetic fibre manufacturing systems, factors to be considered while mixing with natural fibres, Scope and demand.

Unit IV Fiber Linear Density and Fiber Identification **6 h**

Systems of linear density of fiber and filament expression - tex, decitex, millitex, denier, micronaire; Identification of textile fibers - feel, microscopic, burning, and solubility.

Unit V Textile Industry and Processes **11 h**

Fiber-to-fabric conversion - Introduction to the process of converting fibre to yarn, Types of yarns - spun yarn and filament yarn, Yarn count and yarn twist, Yarn numbering system, Novelty yarns. Introduction to the process of Conversion of yarn into fabric, Basic weaves and design, Knitted fabrics, Non-woven fabrics, Grey fabric inspection.
Fibres and its application - natural and manmade fibre applications in the field of Apparel industries - Lining, sewing thread and fabric. Technical textile – industrial, geo, medical, footwear, protective, functional, tyre cords and agro textile. Contemporary issues:

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Textbooks:

1. Physical Properties of Textile Fibres, Morton W. E. and Hearle J. W. S., The textile Institute, Washington D.C., 2008.
2. Textile Engineering- An Introduction, Yasir Nawab (Ed.), De Gruyter Oldenbourg, 2016.
3. Textile Science: An Explanation of Fibre Properties, Gohl, E. P. G., Vilensky, L. D., CBS Publisher, 1984.
4. Woven Fabric Production - I (lst Edition) by NCUTE Publication, 2002.
5. Fundamentals of Spun Yarn Technology by Lawrence Carl A. CRC press London, 2003.

Reference Books:

1. H.V. Srinivasa Moorthy, "Introduction to Textile Fibres", Woodhead Publishing Series in Textiles, 2015.
2. S.P. Mishra, "Fibre Science and Technology", New Age International (P) Ltd., 2010.
3. Principle of Weaving by Marks & Robinson, Textile Institute, 1976
4. Weaving Machines, Mechanisms and Management by Talukdar M. K., Ajgaonkar D. B. and Sriramulu P. K. Mahajan Publishers Pvt. Ltd, 2004. Garment Technology for Fashion Design by Cooklin Gerry, Wiley-Blackwell; 2 edition, 2012.
5. Handbook of Technical Textiles, Edited by A. R. Horrocks and S. C. Anand, CRC Press, 2000.

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