DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO. SU/Engg./B.Tech.F.Y./31/2016

It is hereby inform to all concerned that, on the recommendation of the Committee; the Hon'ble Vice-Chancellor has accepted **the "Revised Syllabus of First Year of Bachelor of Technology (F.Y. B.Tech.) under Choice Based Credit and Grading System** under the Faculty of Engineering and Technology in his emergency powers under Section-14[7] of the Maharashtra Universities Act, 1994 on behalf of the Academic Council.

This is effective from the **Academic Year 2016-2017** and onwards.

This syllabus is also available on the University website www.bamu.ac.in

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO. SU/F.Y. B.TECH. /
2016/5517-25
Date:- 02-09-2016.

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Director,
Board of College and
University Development.

Copy forwarded with compliments to:-

1] The Principals of concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.

Copy to :-

1] The Controller of Examinations,
2] The Section Officer, [Engineering Unit],
3] The Programmer [Computer Unit-1] Examinations,
4] The Programmer [Computer Unit-2] Examinations,
5] The Co-Ordinator, E-Suvidha Kendra,
6] The Record Keeper.
Dr. Babasaheb Ambedkar Marathwada University,

N.B. : All are informed that to download a copy of curriculum from the above website as per their requirement..

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DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Revised Syllabus of

BACHLOR OF TECHNOLOGY

FIRST YEAR

(I & IIND SEMESTER)

UNDER CHOICE BASED CREDIT AND GRADING SYSTEM

Under Faculty of Engineering & Technology

[Effective from 2016-17 & onwards]

FACULTY OF ENGINEERING AND TECHNOLOGY
F. Y. B. Tech (All)
Revised Structure w. e. f. July 2016

Course Code	SEMESTER - I	Contact Hrs / Week				Examination Scheme						
	Course	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
BSH101	Engineering Mathematics - I	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH102/103	Engineering Physics/ Engineering Chemistry	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH104	Basic Electrical Engineering	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH105	Engineering Drawing	4	-	-	4	20	80	-	-	100	4	4 Hrs
BSH106	Computer Fundamentals & Programming	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH107	Basic Civil Engineering	2	-	-	2	10	40	-	-	50	2	2 Hrs
BSH121/122	Lab I/Lab II - Engineering Physics/Engineering Chemistry	-	-	2	2	-	-	50	-	50	1	
BSH123	Lab III - Basic Electrical Engineering	-	-	2	2	-	-	50	-	50	1	
BSH124	Lab IV - Engineering Drawing	-	-	2	2	-	-	50	-	50	1	
BSH125	Lab V - Computer Fundamentals & Programming			2	2			-	50	50	1	
BSH126	Lab VI - Workshop Practice I	-	-	2	2	-	-	50	-	50	1	
	Total of Semester-I	**18**	**5**	**10**	**32**	**110**	**440**	**200**	**50**	**800**	**27**	

Course Code	SEMESTER-II	Contact Hrs / Week				Examination Scheme						
	Course	L	T	P	Total	CT	TH	TW	P	Total	Credits	Duration of Theory Exam
BSH151	Engineering Mathematics-II	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH102/103	Engineering Chemistry/ Engineering Physics	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH152	Basic Electronics	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH153	Engineering Mechanics	4	-	-	4	20	80	-	-	100	4	3 Hrs
BSH154	Basic Mechanical Engineering	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH155	Environment & Ecology	2	-	-	2	10	40	-	-	50	2	2 Hrs
BSH121/122	Lab II/Lab I Engineering Chemistry / Engineering Physics	-	-	2	2	-	-	50	-	50	1	
BSH171	Lab VII Basic Electronics	-	-	2	2	-	-	50	-	50	1	
BSH172	Lab VIII Engineering Mechanics	-	-	2	2	-	-	50	-	50	1	
BSH173	Lab IX Basic Mechanical Engineering	-	-	2	2	-	-	50	-	50	1	
BSH174	Lab X Development of Skills-I	-	-	2	2	-	-	-	50	50	1	
	Total of Semester-II	**18**	**5**	**10**	**32**	**110**	**440**	**200**	**50**	**800**	**27**	
	Grand Total of I & II									**1600**	**54**	

L: Lecture hours per week T: Tutorial hours per week P: Practical hours per week CT: Class Test
TH: University Theory Examination TW: Term Work P: Practical/Oral Examination

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of F. Y. B. Tech (All)

Course Code: BSH101

Course: Engineering Mathematics - I	**Credits: 4**
Teaching Scheme:	**Class Test: 20 Marks.**
Theory: 3 hrs/week	**Theory Examination: 80 Marks**
Tutorial: 1 hr/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) To develop Logical understanding of the subject. 2) To develop mathematical skills so that students are able to apply mathematical methods and principles in solving problems from different engineering fields. 3) To inculcate computational skills.
Unit-I	**Matrix** Rank of matrix, canonical form of matrix, normal form of matrix, solution of simultaneous linear equations (homogeneous & non homogenous), linear dependence & independence of the vectors, Caley- Hamilton theorem, Application of matrices (Rotation, Alternate to Gauss Elimination). **(10 h)**
Unit-II	**Infinite series** Introduction to infinite sequences & infinite series, Test of convergence & divergence of infinite series: nth term test, integral test, p-series, comparison test, ratio test, nth root test. **(06 h)**
Unit-III	**Successive Differentiation** Nth derivative of some standard functions, Leibnitz's theorem, Taylor's and Maclaurin's Theorem, Expansion of function in power series (standard series), Evaluation of standard series, Indeterminate form. **(08 h)**
Unit-IV	**Complex Number** Introduction to complex number, De-Moivrer's theorem, root of complex number, circular function & hyperbolic function, relation between circular & hyperbolic function, inverse hyperbolic functions, separation of real & imaginary parts. Logarithm of complex quantity**.** **(12 h)**
Unit-V	**Partial Differentiation** Partial derivatives, Total Derivatives, Euler's theorem on Homogeneous function, Implicit Function, Change of independent variables. **(07 h)**
Unit-VI	**Maxima and Minima** Maxima and Minima of two independent variables, Jacobians and Their Applications **(05 h)**

	Sr. No.	Title	Authors	Publication
Reference Books	1	A Text Book Of Applied Mathematics Volume-I	P. N. Wartikar J. N. Wartikar	Pune Vidyaryhi Griha Prakashan
	2	Advanced Engineering Mathematics	H. K. Dass	S. Chand And Co.Ltd
	3	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers
	4	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw-Hill Publishing Co.Ltd.
	5	Advanced Engineering Mathematics	Erwin Kreyszig	Willey Eastern Ltd. Mumbai

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:

The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of F. Y. B. Tech (All)

Course Code: BSH102

Course: Engineering Physics	**Credits: 4**
Teaching Scheme:	**Class Test: 20 Marks.**
Theory: 3 hrs/week	**Theory Examination: 80 Marks**
Tutorial: 1 hr/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) To study physical properties, basic facts, concepts and physical quantities required in engineering. 2) To learn basic principles of Physics and laws of scientific investigation for exploring various segments of engineering. 3) To gain competency in engineering career by understanding the engineering applications of Physics.
Unit-I	**Optics** Newton's ring in reflected light, applications of interference in determination of wavelength, refractive index, optical flatness and anti-reflection coating, diffraction of light, diffraction Grating, Polarization, Nicol prism, optical activity and specific rotation, Laurent's half shade polarimetry, applications of polarization. **Laser** Properties of laser, spontaneous and stimulated emission, Meta stable state, population inversion, active medium, pumping, resonant cavity, ruby laser, He-Ne laser, applications **(08 h)**
Unit-II	**Superconductivity** Phenomenon, zero electrical resistivity, effect of temperature and magnetic Fields, Messiner effect, type I and II superconductors, Applications **Acoustics** Reverberation and reverberation time, absorption coefficient, Sabine's formula (derivation not necessary) acoustical design of hall. **Ultrasonic** Properties, Production of ultrasonic by piezo-electric and magnetostriction generator, engineering applications of ultrasonic **(08 h)**
Unit-III	**X-rays and Crystal Structure** Crystalline and Amorphous material, lattice and unit cell, Miller indices, atomic radius, coordination number, packing factor calculation for sc, bcc, fcc **X-rays** continuous and characteristics spectrum, Bragg's law of X-ray diffraction, Bragg's spectrometer, powder crystal Method. **(08 h)**
Unit-IV	**Nuclear Physics** Nuclear fission and fusion, chain reaction, controlled and uncontrolled chain reaction, nuclear reactor, P-P cycle, C-N cycle, Accelerators-cyclotron **Modern Physics** Wave particle duality, De- Broglie concept of matter wave, Davission-Germer experiment Intrinsic and extrinsic semiconductors (Descriptive and

	Analytical), Hall effect and its applications, solar cells. **(08 h)**
Unit-V	**Dielectrics** Dielectric constant, Induced and Permanent dipoles, Polar and Non-Polar dielectrics, Polarization of dielectric materials, Types of polarization, Applications of dielectric materials. **Magnetic Materials** Soft and hard magnetic materials and their application. **Nanomaterials and Nanotechnology** Properties of nonmaterials optical, electrical, mechanical, and magnetic, Introduction to nanotechnology and applications in computer chips, storage devices, catalysis, sensors, environmental, space, defense and automobile. **(08 h)**
Unit-VI	**Fiber Technology** Propagation of light through optical fiber, acceptance angle and cone numerical aperture, Single and Multi Mode Fibers, applications, basic Principle of Holography, applications of holography. **Electron Optics** Electron refraction Bethe's law, cathode ray tube (CRT – Construction and working), determination of e/m Thomson's method, Positive rays production and properties, Bainbridge mass spectrograph. **(08 h)**

	Sr. No.	**Title**	**Authors**	**Publication**
Reference Books	1	A Text book of Engineering Physics	M. N. Avadhanulu P. G. Kshirsagar	S. Chand & Co.
	2	A Text book of Engineering Physics	R. K. Gaur S. L. Gupta	Dhanpat Rai
	3	Fundamentals of Physics	David Halliday, Jearl Walker and Robert Resnick	Wiley
Websites	1	http://science.howstuffworks.com/laser1.htm		
	2	http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html		
	3	http://nptel.ac.in/courses/122107035/		
	4	http://nptel.ac.in/courses/122104016/		

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:

The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of F. Y. B. Tech (All)

Course Code: BSH103

Course: Engineering Chemistry	**Credits: 4**
Teaching Scheme:	**Class Test: 20 Marks.**
Theory: 3 hrs/week	**Theory Examination: 80 Marks**
Tutorial: 1 hr/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) To relate the concepts of chemistry in all engineering discipline. 2) To acquaint students with modern techniques in Engineering Chemistry this can be applied in engineering field. 3) To identify, formulate and solve engineering problems.
Unit-I	**Water** Hardness of water, types and units, Estimation of hardness by EDTA method, Boiler troubles: scale, sludge, priming, foaming and caustic embrittlement; Boiler feed water treatment: external treatment-ion exchange process, internal treatment: phosphate conditioning. Numaricals on hardness. **Separation techniques** Chromatography- Principle, techniques and applications of Paper Chromatography, Thin layer Chromatography. **(08 h)**
Unit-II	**Fuels** Classification, calorific value, gross and net , solid fuel: proximate and ultimate analysis of coal, it's importants, liquid: petroleum and its refining by Fractional distillation, knocking :octane and cetane number and significance; gaseous fuel: producer gas. **Batteries** Introduction, types of batteries, fuel cell : phosphoric cell, secondary battery- Lead storage battery. **(08 h)**
Unit-III	**Lubricants** Classification, Mechanism of lubrication, solid lubricant-Graphite, semisolid lubricant-greases, properties of liquid lubricant- viscosity and viscosity index, Flash point and fire point, cloud point and pour point, Acid value. Numaricals on viscosity index. **Green Chemistry** Introduction, Principles and significance, industrial applications: Example supercritical fluid/solvent(CO_2). **(08 h)**
Unit-IV	**Engineering Materials** **Plastics** Thermoplastics and thermosetting polymers, properties and engineering applications of PVC Backelite, Biodegradable polymers - properties, applications of polyvinyl acetate. **Thermal Insulating Materials** Definition, properties and applications of thermal insulators - Thermacol, glass wool. **Cement and Refractories**

	Composition, setting and hardening of cement. Refractories -Types, properties and applications. **(08 h)**
Unit-V	**Corrosion** Dry and Wet corrosion and their Mechanism, Types-Pitting, intergranular corrosion, Galvanic and stress corrosion. Role of design and material selection in corrosion control, Cathodic protection, Hot dipping-Galvanizing and Tinning. **(08 h)**
Unit-VI	**Alloys** Definition and purpose of alloy; composition, properties and applications of Alnico, Duralumin, Gun metal. **Phase Rule** Gibb's phase rule, Concept of components, phase, degree of freedom. One component system - Watersystem,Twocomponentsystem-Lead-Tinsystem (Pb - Sn). **(08 h)**

	Sr. No.	**Title**	**Authors**	**Publication**
Reference Books	1	Engineering chemistry	Jain & Jain	Dhanpat Rai publishinn
	2	Fundamentals of engineering Chemistry (theory and practical	S. K. Singh	New age international Publishers
	3	Chemistry in Engineering & Technology	J. C. Kuriacose & J. Rajaram	
	4	Material Science & processes	S. K. Hajra Choudhary	Indian Book Distribution
	5	A Textbook of Polymer Science	Fred, Billmeyer Jr.	Wiley India
	6	Chemistry of Engineering Materials	C. V. Agarwal, C. P. Murthy, A. Naidu	B. S. Publication
	7	Engineering chemistry	B. Siva Shankar	Mc Graw Hills Publication
	8	Chemistry of Advanced Materials	CNR Rao	Rsc. Publication

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:

The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of F. Y. B. Tech (All)

Course Code: BSH104

Course: Basic Electrical Engineering	**Credits: 4**
Teaching Scheme:	**Class Test: 20 Marks.**
Theory: 3 hrs/week	**Theory Examination: 80 Marks**
Tutorial: 1 hr/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) To give knowledge of Basic Concepts of Electrical Engineering. 2) To understand R, L & C with DC & AC Supply & DC Theorems. 3) To study Electromagnetism & Fundamentals of AC Circuits. 4) To study construction, working of single phase transformer.
Unit-I	**General Concept** EMF, P.D. & Current, Definitions of R, L, C- Resistance for Metal, Alloys, Insulators. Factors upon which resistance depends, specific Resistance-Conductance-Effect of temperature on resistance, temperature coefficient, Positive and Negative temperature coefficients. SI Units of work, power & Energy**.** **(06 h)**
Unit-II	**D.C. Circuit** Ohm's Law, Kirchhoff's Laws. Constant & practical voltage & Current sources - Internal resistance - Simplification of Networks using series & parallel combinations, Star Delta conversions, Current and Voltage Divider, Nodal, loop analysis - Theorems - Thevnins, Superposition and Maximum power transfer theorem. **(10 h)**
Unit-III	**Electromagnetism.** **A**. Magnetic Effect of an Electric Current, Cross & Dot Conventions, Right Hand Thumb Rule (Cork's Screw Rule) Nature of Magnetic field of Long Straight Conductor, Solenoid & Toroid. **B**. MMF, Flux, Flux Density, Reluctance, Permeability & Field Strength, Their units & Relationships. Magnetic circuits, Comparison of Electrical & Magnetic Circuits, Force on current carrying conductor placed in magnetic field, **C**. Faraday's laws of Electromagnetic Induction, Flemings rule, Statically & Dynamically induced EMF. Self & Mutual Inductance, Co-efficient of coupling, Energy stored in magnetic field**.** **(10 h)**
Unit-IV	**Measuring Instruments** Principle, Construction and Application of moving coil, moving iron, Dynamometer Type, Induction type instruments. Extension of range of ammeter, voltmeter (Shunt and Multitier) Single phase induction type Energy meter. **(06 h)**
Unit-V	**AC Fundamentals** Sinusoidal voltages & Currents, Their Mathematical & Graphical Representation, Concept of Instantaneous Peak (Maximum)Average & RMS Values, Frequency, Cycle, Time Period, Peak Factor & Form Factor, Phase

	difference, Lagging , Leading Phasor representation for pure R, L, C. R-L, R-C & R-L-C series and parallel resonance Circuits & Q factor. **(10 h)**
Unit-VI	**Single Phase Transformer** Principle of working, Construction &Types of transformer, Core type & Shell Type, EMF equation, Ideal & Practical transformer on no load, on load. Regulation & efficiency of transformer by direct loading. (**06 h)**

	Sr. No.	**Title**	**Author**	**Publication**
Reference Books	1	Electrical Technology Vol. I & II	B. L. Theraja	S. Chand Delhi
	2	Basic Electrical Engineering	J. B. Gupta	Katsons Books, Delhi
	3	Basic Electrical Engineering	V. K. Mehta	S. Chand, Delhi
	4	Basic Electrical Engineering	V. N. Mittal	S. Chand, Delhi
	5	ABC Of Electrical Engineering	Ashfaq Hussein	Dhanpatrai & Co, Delhi
	6	Basic Electrical Engineering	E. Huges	Mc-Graw Hill, New Delhi

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:
The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of F. Y. B. Tech (All)

Course Code: BSH105	**Credits: 4**
Course: Engineering Drawing	**Class Test: 20 Marks.**
Teaching Scheme:	**Theory Examination: 80 Marks**
Theory: 4 hrs/week	**Theory Examination (Duration): 4 hrs**

Objectives	1) To develop vision and imagination skill required for drawing engineering components. 2) To draw various engineering components in 2-D and 3-D by using first angle method of projection. 3) To develop dimensioning and lettering skills while representing engineering components.
Unit-I	**Projections of Straight Lines** Line inclined to one plane, line inclined to both the reference planes, and in different quadrants, traces of a line. (**08 h)**
Unit-II	**Projections of Planes** Planes with surface inclined to both the planes. Planes such as- triangles, squares, rectangles, quadrilaterals, pentagon, hexagon, circle, semicircle. (**06 h)**
Unit-III	**Projections of Solids** Projections of solids such as prism, cylinder, pyramid, cone, sphere, frustum, cube, tetrahedron with axis inclined to one or both the reference planes. (**10 h)**
Unit-IV	**Sections of Solids** Projections of regular solids such as prism, cylinder, pyramid, cone, cube, and tetrahedron cut by cutting planes inclined to one plane. Determination of cutting plane angle from the given true shape of the section. (**07 h)**
Unit-V	**Orthographic Projections** Obtaining orthographic projections of different machine parts from the given 3D view, sectional orthographic projections. (**07 h)**
Unit-VI	**Isometric Projections** Introduction to isometric projections and isometric views, isometric and non isometric lines. Drawing Isometric views of simple machine parts. (**10 h)**

	Sr. No.	Title	Authors	Publication
Reference Books	1	Engineering Drawing	N. D. Bhatt and V. M. Panchal	Charotar Publishing House
	2	Engineering Drawing	Basant Agarwal and Agarwal C. M	Tata McGraw Hill Publishing Company Limited, New Delhi
	3	Engineering Drawing	B. V. R. Gupta	IK International Publishing House

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:
The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of F. Y. B. Tech (All)

Course Code: BSH106	**Credits: 4**
Course: Computer Fundamentals & Programming	**Class Test: 20 Marks.**
Teaching Scheme:	**Theory Examination: 80 Marks**
Theory: 3 hrs/week	**Theory Examination (Duration): 3 hrs**
Tutorial: 1 hr/week	

Objectives	1) To get acquainted with the basic components of a computer system and fundamentals of programming Languages. 2) To learn the basics of 'C' programming. 3) To think about basic problems, develop algorithms and write programs using 'C' language.
Unit-I	**Introduction** Definition of a computer, Basic Organization of a Computer, Computer hardware and software, Introduction to an Operating system, Role of an Operating System and its types, Algorithm, Pseudo code, Flow Chart**.** **(06 h)**
Unit-II	**Programming Languages** Introduction to Programming Languages, Types of Programming Languages – Machine-level, Assembly-level and High-level Languages, High-level Programming Language Tools – Compiler, Linker, Interpreter, Editor, Introduction to Matlab. **(06 h)**
Unit-III	**Introduction to C Language** The character set, constants, Variables keywords and operators, Basic data types, Instructions, Type conversion, The C program structure, Simple C program **(12 h)**
Unit-IV	**Decision control structure** Decision control using if, if-else, nested if. Use of logical operators- AND, OR and NOT, Conditional operator. Loops- While, for and do-while, Break and continue statements, Switch -case statement. **(06 h)**
Unit-V	**Arrays and Strings** Array declaration, Initialization, One dimensional and Two dimensional arrays, Matrix operations. Definition of a String. Standard Library Functions -strlen (), strcpy (), strcat (), strcmp (), strrev (). **(10 h)**
Unit-VI	**Functions, Pointers and structures** Introduction to functions, Uses of functions, Function declaration and definition, Scope rule of functions, Call by value, Introduction to pointers, Pointer notation, Call by Reference, Introduction to structures. **(08 h)**

	Sr. No.	Title	Authors	Publication
Reference Books	1	Introduction to computers	Peter Norton	Tata McGraw-Hill
	2	Computer fundamentals	Pradeep K Sinha, Priti Sinha	BPB
	3	Let us C	Yashawant Kanetkar	BPB
	4	The C Programming language	Kernighan, B. W. and Ritchie D.M	Pearson Education
	5	Programming with C	Byron S Gottfried	Tata McGraw-Hill, Schaum's Outlines
	6	Programming in C	Pradip Dey, Manas Ghosh	Oxford

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:
The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of F. Y. B. Tech (All)

Course Code: BSH107	**Credits: 2**
Course: Basic Civil Engineering	**Class Test: 10 marks.**
Teaching Scheme:	**Theory Examination: 40 Marks**
Theory: 2 hrs/week	**Theory Examination (Duration): 2 hrs**

Objectives	1) Create awareness and knowledge in students about basic civil engineering terminologies and techniques which will be helpful in their day to day life. 2) Knowledge of various building materials and structural members. 3) To understand concept of surveying and leveling.
Unit-I	**Civil Engineering Materials** Study of properties and use of civil engineering materials namely bricks, rubble, cement, sand, coarse aggregate. **(04 h)**
Unit-II	**Foundation** Introduction to foundation and types, isolated, footing, combined footing, cantilever footing, Pile foundation - types **(04 h)**
Unit-III	**Masonry** Introduction to brick masonry and bonds in brick, header bond, stretcher bond, English and Flemish bond. **(04 h)**
Unit-IV	**Lintels, Doors and Windows** Types of lintels, definition of technical terms of doors and windows, study of battened, ledged and braced doors casement windows, glazed window, and metal windows. **(04 h)**
Unit-V	**Roofs and Floors** Trussed roofs, king post roof truss and queen post roof truss, flat RCC roof, components of floor, material for construction of floor. **(04 h)**
Unit-VI	**Surveying and Leveling** i) Surveying: Length measurement use of metallic tape and chain (20m & 30m). ii) Angular Measurements: Use of prismatic compass, simple problems. iii) Level measurements: Use of dumpy level, simple problems on calculation of reduced levels. **(04 h)**

	Sr. No.	Title	Authors	Publication
Reference Books	1	Building Materials	Dr. K. A. Patil & Dr. I. K. Pateriya	Laxmi Publication
	2	Building Construction	B.C. Punmia	Laxmi Publication
	3	Building Construction-	Sushil Kumar	Standard Publication
	4	Surveying & Leveling-	B.C. Punmia	Laxmi Publication

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:

The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 40 marks Paper:

1. Minimum eight questions.
2. Four questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

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Course Code: BSH121 **Credits: 1**
Course: Engineering Physics
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To study physical properties, basic facts, concepts and physical quantities required in engineering. 2) To learn basic principles of Physics and laws of scientific investigation for exploring various segments of engineering. 3) To gain competency in engineering career by understanding the engineering applications of Physics.
List of Practical	1. Newton's ring: To determine wavelength of monochromatic light 2. Optical flatness: To test the optical flatness 3. Grating: To determine wavelength of LASER light. 4. Polarimeter: To determine concentration of solution. 5. Reverberation time: To determine Reverberation time of a hall. 6. e/m by Thomson method: To determine charge to mass ratio. 7. Diode Characteristics: To plot characteristics of diode. 8. Zener diode: To plot characteristics of zener diode & to determine zener voltage. 9. Dielectric constant: to determine dielectric constant. 10. Forbidden gap: To determine forbidden gap of semiconductors. 11. Transistor Characteristics in CE Configuration. 12. To determine the Hall coefficient of a semiconductor material and then evaluate carrier type and its density of charge carrier.

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Course Code: BSH122 **Credits: 1**
Course: Engineering Chemistry
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To relate the concepts of chemistry in all engineering discipline. 2) To acquaint students with modern techniques in Engineering Chemistry this can be applied in engineering field. 3) To identify, formulate and solve engineering problems.
List of Practical	1. Determination of hardness (Total, temporary & permanent) of water - EDTA method. 2. Determination of pH value of different solutions by pH paper & pH meter. 3. Determination of strength of acid by Conductometric Titration 4. Determination of percentage of moisture and ash in a coal sample. 5. Determination of Acid value of lubricating oil. 6. To separate Methylene blue and methyl orange by thin layer chromatography. 7. Determination of Flash and fire point of lubricating oil. 8. Preparation of Bakelite or urea formaldehyde plastic. 9. Estimation of calcium from cement. 10. Measurement of corrosion rate using digital mili-voltmeter. 11. To determine Rf value and identify phenyl alanine and glycine mixture by paper chromatography. 12. Determination of molecular weight of polymer-Viscometric method. 13. Determine viscosity of oil by Redwood viscometer**.**

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Course Code: BSH123 **Credits: 1**
Course: Basic Electrical Engineering
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To give knowledge of Basic Concepts of Electrical Engineering. 2) To understand R, L & C with DC & AC Supply & DC Theorems. 3) To study Electromagnetism & Fundamentals of AC Circuits. 4) To study construction, working of single phase transformer.
List of Practical	1. To Study of the accessories to be used in household wirings. 2. i) To understand the Concept of Phase, Neutral & Earthling in Electrical Installation. ii) Single Lamp controlled by single switch circuit in household wiring. 3. To Study & Demonstrate circuit of Fluorescent Tube Light. 4. To Study & Demonstrate Staircase Wiring. 5. To study & understand importance of Series Lamp used in industries for testing. 6. To Verify Ohm's Law. 7. To verify Superposition Theorem. 8. To verify Thevenin's Theorem. 9. To study R-L-C series circuit. 10. To verify Voltage Ratio of single phase Transformer. 11. To verify power in Star/Delta Circuits (resistive load) by measuring voltage and current by ammeter and voltmeter is same in both the case. 12. To calculate Efficiency & Regulation of single phase Transformer.

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Course Code: BSH121 **Credits: 1**
Course: Engineering Drawing
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To develop vision and imagination skill required for drawing engineering components. 2) To draw various engineering components in 2-D and 3-D by using first angle method of projection. 3) To develop dimensioning and lettering skills while representing engineering components.
List of Practical	**Sheet No. 1**: To solve at least four problems based on line inclined to both the planes for i) Obtaining projections of line inclined to both the planes. ii) Determination of true length and true inclinations of the line. **Sheet No. 2:** To solve at least two problems based on **l**ocating traces of the line and its use for obtaining true length and inclination of the line and two problems on applications of straight lines with following objectives. **Sheet No. 3**: To solve at least four problems on planes inclined to both the reference planes for i) Obtaining projections of planes of different shapes, inclined to both the planes. ii) Determination of true shape and inclinations of the plane. **Sheet No. 4**: To solve at least four problems based on solids with axis inclined to both the planes for i) Obtaining projections of different regular geometrical solids. **Sheet No.5:** To solve at least two problems based on Projections of Spheres **Sheet No. 6**: At least two problems based on sections of solids for i) Drawing section line view of the cutting plane in correct view. ii) Drawing sectional view, and true shape of the section. iii) Determining inclination of the cutting plane from the given true shape of the section. **Sheet No.7:** At least two problems to be solved on, orthographic projections for i) Reading the 3D drawings and converting it in 2D views. **Sheet No.8:** At least two problems to be solved on Sectional Orthographic Projections. **Sheet No. 9:** Solving at least two problem for drawing isometric view for i) Reading the 2D drawings and converting it in 3D views **Sheet No.10:** Solving at least two problems on isometric projections for simple machine parts.

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Course Code: BSH125 **Credits: 1**
Course: Computer Fundamental & Programming
Teaching Scheme: **Practical/Oral Examination: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To get acquainted with the basic components of a computer system and fundamentals of Programming languages. 2) To learn the basics of 'C' programming. 3) To think about basic problems, develop algorithms and write programs using 'C' language.
List of Practical	1. The length, breadth of a rectangle and radius of a circle are input through the keyboard. Write a program to calculate the area of the rectangle and circle. 2. Any integer is input through the keyboard. Write a program to find out whether it is an odd number or even number. 3. Write a program to print the multiplication table of the number entered by the user. The table should get displayed in the following form. 11 * 1 =11 11 * 2 = 22 4. Any year is entered through the keyboard. Write a program to determine whether the year is leap or not using the logical operators. 5. Write a menu driven program which has the following options: i) Addition of two integers ii) Subtraction iii) Multiplication iv) Exit Make use of switch statement. 6. Write a program for the addition of two matrices using a 2-D array. 7. Write a program to demonstrate the following string handling functions strlen(), strcpy(), strcmp(), strcat(), strrev(). 8. Write a program to define a function for finding the factorial of a number. 9. Write a program to increment and decrement the values of a variables using call by reference. 10. Create a structure to read and display the following information of a student: Roll number, Name, Department, Course, Year of joining.

The assessment shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus mentioned above.

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Course Code: BSH126 **Credits: 1**
Course: Workshop Practice - I
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To have hands on practice and understanding of fitting process and tools. 2) To have hands on practice and understanding of smithy process and tools. 3) To have hands on practice and understanding of sheet metal process and tools.

	Section	**Contents**
List of Practical	**Fitting**	**i) Study of different tools of fitting & processes involved in fitting.** **Workshop Diary** - Draw sketches and description of fitting tools and sketches of the job. **Practical** - One composite job involving simple fitting operation like sawing, marking, filling & tapping operation: minimum one job (Male - female fitting)
	Black Smithy	**ii) Study of different smithy tools & processes.** **Workshop diary** - Draw sketches and description of smithy tools and sketches of the job. **Practical** - Preparation of one job making round cross section to square bar.
	Sheet Metal Working	**iii) Study of different sheet metal tools.** **Workshop diary** - Sketches and description of sheet metal tools and sketches of the job. **Practical** - One job involving development of surfaces, marking on sheet metal cutting, bending, joint preparation by folding.

The assessment shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus mentioned above.

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Course Code: BSH151

Course: Engineering Mathematics - II	**Credits: 4**
Teaching Scheme:	**Class Test: 20 Marks.**
Theory: 3 hrs/week	**Theory Examination: 80 Marks**
Tutorial: 1 hr/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) To develop Logical understanding of the subject. 2) To develop mathematical skills so that students are able to apply mathematical methods and principles in solving problems from different engineering fields. 3) To inculcate computational skills.
Unit-I	**Differential Equations** Solution of differential equation of first order and first degree: Exact , Linear and Reducible to linear form, orthogonal trajectories. **(08 h)**
Unit-II	**Application of Differential equations** Application of first order and first degree to mechanics, electrical circuit. **(04 h)**
Unit-III	**Curve Tracing** Tracing of Cartesian Curve , Polar curve and Their Rectification. Radius of curvature for Cartesian curve, Radius of curvature at origin. **(12 h)**
Unit-IV	**Integral Calculus** Reduction Formulae, Beta Function, Gamma Function, Relation between Beta and Gamma Function. **(06 h)**
Unit-V	**Multiple Integrals** Double Integration in Cartesian and Polar co-ordinates, Change of order of Integration, Change to polar co- ordinates, Triple integral, Application to areas, volumes, surfaces areas and volume of revolutions. **(12 h)**
Unit-VI	**Fourier Series** Dirichlet's conditions, Euler (Euler-Fourier) formulae, Fourier series for function having period 2L, Fourier series for even and odd function in the interval (-L, L), Half range expansions: Fourier sine and cosine series. **(06 h)**

	Sr. No.	Title	Author	Publication
Reference Books	1	A Text Book Of Applied Mathematics Volume-I	P. N. Wartikar J. N. Wartikar.	Pune Vidyaryhi Griha Prakashan
	2	Advanced Engineering Mathematics	H. K. Dass.	S. Chand And Co. Ltd
	3	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers
	4	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw- Hill Publishing Co. Ltd.
	5	Advanced Engineering Mathematics	Erwin Kreyszig,	Willey Eastern Ltd. Mumbai

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:

The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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Course Code: BSH152

Course: Basic Electronics Engineering	**Credits: 4**
Teaching Scheme:	**Class Test: 20 Marks.**
Theory: 3 hrs/week	**Theory Examination: 80 Marks**
Tutorial: 1 hr/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) To develop Logical understanding of the subject. 2) To study Logic gates and their usage in digital circuits. 3) To introduce basic aspects of transducers and electronic communication systems with their applications.
Unit-I	**Semiconductor Devices and its Application** Semiconductor and its types, Constructional features, working and Characteristics of PN Junction Diode, Zener Diode, LED, BJT, FET, MOSFET. **(08 h)**
Unit-II	**Rectifiers** Definition – Need of Rectification, Circuit diagram, Operation, i/p and o/p Waveforms of Half wave - Full wave, Bridge rectifiers (without filters), Uses of filters in rectifier circuit, Ripple factor, Efficiency and PIV, Comparison, Regulated Power Supply. **(08 h)**
Unit-III	**Operational Amplifier** Block diagram of Operational Amplifier, Inverting and Non-Inverting Configuration and parameters, Ideal Characteristics of Operational Amplifier, Operational Amplifier Applications such as Summing amplifier, Difference amplifier, Integrator, Differentiator and Comparator. **(08 h)**
Unit-IV	**Digital Circuit** Basic logic gates, universal logic gates, Boolean algebra, Introduction to logic families, Half Adder, Full Adder, Multiplexer, De-multiplexer, D-Flip-Flop. **(08 h)**
Unit-V	**Transducers** Definition –Transducer, Classification of Transducer, Selection of Transducer, Temperature Transducers like RTD, Thermocouple, Thermister, Flow measurement, Level measurement, Pressure measurement, Displacement measurement . **(08 h)**
Unit-VI	**Electronics Communication** Importance of Communication System, The elements of a Communication System, Transmission Media: Wired (Twisted pair, Coaxial and Optical Fiber Cables) and Wireless, Need for Modulation, Analog Modulation Scheme: AM and FM, Mobile Communication System: Cellular Concept, Simple block diagram of GSM System. **(08 h)**

	Sr. No.	Title	Author	Publication
Reference Books	1	Integrated Electronics	Miliman, Halkies	TataMc-Graw Hill, New Delhi
	2	Linear Integrated Circuit and operational amplifier	Ramakant Gaikwad	Prientice Hall of India
	3	Modern Digital Electronics	R. P. Jain	TataMc-Graw Hill, New Delhi
	4	Electronics and Electrical Measurement and instrumentation	A. K. Sawhney	Dhanpat Rai & sons
	5	Applied Electronics	R. S. Sedha	S.Chand & Co., New Delhi
	6	Principles of Electronics	V. K. Mehta	S.Chand & Co., New Delhi
	7	Electronics Communication System	George Kenedy	TataMc-Graw Hill, New Delhi
	8	Electronics Instrumentation	H. S. Kalasi	TataMc-Graw Hill, New Delhi

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:
The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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Course Code: BSH153	**Credits: 4**
Course: Engineering Mechanics	**Class Test: 20 Marks.**
Teaching Scheme:	**Theory Examination: 80 Marks**
Theory: 4 hrs/week	**Theory Examination (Duration): 3 hrs**

Objectives	1) Knowledge of various systems of forces to the students from all branches of engineering. 2) To understand the basics of mechanics. 3) To study fundamentals and to impart knowledge about role of statics and dynamics.
Unit-I	**Force System** Basic definitions , Force, Rigid Body, Particle, Moment of a force, Principle of Transmissibility, Principle of super position, Varignon's Theorem, Lami's Theorem, Law of Parallelogram of Force, Resolution and Composition of Forces, Force Systems(co-planer 2-D System only), Analytical method to determine Resultant, equivalent force couple. Free body Diagrams, concept of Equilibrium, Equilibrium of 2- D Force System, Analysis of pin-jointed plane frames, types of Supports, types of loading, Beam Reactions. **(09 h)**
Unit-II	**Plane Trusses** Analysis of pin jointed plane Trusses by Method of Joint, Method of Section, Graphical Method. **Virtual Work** Principe of Virtual Work, Application to Beams. **(07 h)**
Unit-III	**Friction** Basic definitions, Laws of Friction, Cone of Friction, Angle of repose, Limiting Equilibrium for bodies under force systems, Belt Friction. **Centre of Gravity and Moment of Inertia** Derivation of CG and MI of standard shape of lines, plane Lamina, Radius of Gyration, Parallel and Perpendicular Axis Theorem. **(08 h)**
Unit-IV	**Kinematics of Particles** Linear motion, Motion with constant acceleration, Motion with variable acceleration, Motion Diagrams, Curvilinear motion, Relation between Linear and Curvilinear motion, Tangent and Normal Acceleration, Projectile Motion, Relative Velocity and Resultant Velocity. **(08 h)**
Unit-V	**Kinematics of Rigid Bodies** Plane motion of particles and connected bodies, Linear Motion, Translation, Combined Linear and Translation Motion. **Kinetics of Particles** Linear Motion of Particles and Connected Bodies. **(10 h)**
Unit-VI	**Kinetics of Rigid Bodies** Rotational motion, rolling without slipping, D'Alemeberts Principle, Impact

	and Impulse. **(06 h)**

	Sr. No.	Title	Author	Publication
Reference Books	1	Engineering Mechanics	R. K. Bansal	Laxmi Publication
	2	Engineering Mechanics	A. R. Basu	Dhanpatrai and Sons
	3	Engineering Mechanics	Nelson and Mclean	Mc Graw Hill Book, Inc
	4	Engineering Mechanics	B. Prasad	Khanna Publications
	5	Vector Mechanics for Engineers	F. B. Beer and E. R. Johnston	Mc Graw Hill Book, Inc

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:
The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:
1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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Course Code: BSH154	**Credits: 4**
Course: Basic Mechanical Engineering	**Class Test: 20 Marks.**
Teaching Scheme:	**Theory Examination: 80 Marks**
Theory: 3 hrs/week	**Theory Examination (Duration): 3 hrs**
Tutorial: 1 hr/week	

Objectives	1) To understand fundamental concepts of thermal engineering. 2) To study engineering applications of thermal engineering. 3) To understand working principle of machine tools. 4) To understand the functions of various power transmitting elements.
Unit-I	**Fundamental concepts and Definitions** Scope of thermodynamics, brief idea about various fields of applications. Macroscopic & microscopic description of matter, pure substance, working substance, thermodynamic system & its types, thermodynamic state of system, thermodynamic properties, reversible and non reversible process, cyclic and non-cyclic processes, thermodynamic equilibrium, Zeroth law of thermodynamics. Concept and measurement of temperature, temperature scales, pressure measuring devices. (Numerical treatment on pressure and temperature measurement). **(08 h)**
Unit-II	**Work, Heat and First Law of Thermodynamics** Thermodynamic definition of work, types of work, quasi static process, PdV work for different processes, Definition of heat, specific heat, modes of heat transfer, laws governing the modes of heat transfer, comparison between heat & work. (Numerical on types of works), Statement of First law of thermodynamics, verification of first law by Jules experiment, First law for cyclic and non cyclic (Non flow) processes. (Numerical on single process only). **(08 h)**
Unit-III	**Thermal Machines** Classification of boiler, construction and working of Lancashire boiler only, boiler mountings and accessories location and applications only. Working of 2 stroke & 4 stroke CI & SI engines. Principle and working of vapor compression refrigerator. Principle and working of air conditioner and air cooler. **(04 h)**
Unit-IV	**Introduction to Engineering Materials** Introduction, Classification, Properties, Selection and application of materials. Basic heat treatment Processes: Annealing, Normalizing and Hardening. **Metal forming and Metal Joining Processes** Introduction and classification only. **(04 h)**
Unit-V	**Machine Tools** Introduction and classification of machine tools, working principle block diagram and operations carried on Lathe machine, Drilling machine, Milling machine, Shaping machine and Grinding machines.

	(08 h)
Unit-VI	**Power Transmission Elements** **Belt** Types of belt and its material, Belt Drives-types and application, velocity ratio, creep and slip in belt. **Pulleys** Idler pulley stepped pulley, fast and loose pulley. **Gears** Definition, Terminology, types and uses. Gear drives. **Bearings** types and application. **Keys and Coupling** Types of keys, coupling types, rigid flange and bushed pin flexible coupling. **Clutch** Types, description friction clutches. **(08 h)**

	Sr. No.	**Title**	**Author**	**Publication**
Reference Books	1	Fundamentals of classical Thermodynamics	P. K. Nag	Tata Mc Graw Hill
	2	Thermodynamics An Engineering Approach	Y. Cengel & M. Boles	Mc Graw Hill
	3	Thermal Engineering	R. K. Rajput	Laxmi Publication
	4	Engineering Thermodynamics (Principles and Practices)	Dr. D. S. Kumar	Katsons Publications
	5	Workshop Technology	Hajara Chowdhary	Media Promoters
	6	Manufacturing Science	Amitabha Ghosh and Mallik	East West Press
	7	Manufacturing Technology	P. N. Rao	Tata Mc Graw Hill
	8	Comprehensive Workshop Technology (Manufacturing Processes)	S. K. Garg	Laxmi publications.

Section A: Units I, II, III and Section B: Units IV, V, VI.

Pattern of Question Paper:
The six units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

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Course Code: BSH155	**Credits: 2**
Course: Environment and Ecology	**Class Test: 10 Marks.**
Teaching Scheme:	**Theory Examination: 40 Marks**
Theory: 2 hrs/week	**Theory Examination (Duration): 2 hrs**

Objectives	1) To study environment as a whole with all the basic concepts related to it. 2) To study ecological factors of the environment. 3) To study different types of pollution and their ill effects on mankind. 4) To study various technologies used for betterment of environment and health. 5) To study various rules and regulations specially developed for environmental betterment
Unit-I	**General Introduction** Scope and importance, Environmental segments, Classification of Resources - Renewable & non renewable (Water, Forest, Energy resources), Environmental degradation and its impacts - Acid rain, ozone layer depletion. **(04 h)**
Unit-II	**Ecology** Concept and classification of ecosystem, Food chain, Food web, Ecological pyramids. **(03 h)**
Unit-III	**Pollution** Types of pollution, Sources and effects of - air pollution, water pollution, land pollution, noise pollution, thermal pollution, radioactive pollution, case study on - air pollution (Bhopal gas tragedy), water pollution (Minamata disease), radioactive pollution (Chernobyl tragedy). **(05 h)**
Unit-IV	**Environment and Technology** Role of technology in environment and health, GIS, Carbon footprint, Disaster management - Flood, Earthquake, Cyclone and Landslide. **(04 h)**
Unit-V	**Environmental Biotechnology** Definition, current status of biotechnology in environmental protection, bio-fuels, bio-fertilizers, bio-surfactants, bio-sensors, bio-chips, bio-reactors. **(04 h)**
Unit-VI	**Environmental Legislation** Overview, Role of Ministry of Environment and Forests, Functions and powers of central pollution control board, , Functions and powers of state pollution control board, Environmental clearance, Consent and Authorization Mechanism, Environmental Protection Act, Environmental impact assessment. **(04 h)**

	Sr. No.	Title	Author	Publication
Reference Books	1	Textbook of environmental studies	Erach Bharucha	University Press
	2	Handbook of Environmental Laws, Rules guidelines, compliances and standards Volume I and II		Enviro Media ®
	3	Ecology	Odem E. P	
	4	Environmental Biotechnology	S. N. Jogdand	Himalaya Publishing house
	5	Environmental chemistry and pollution control	Dr. S. S Dara & Dr. D. D. Mishra	S. Chand

Section A: Units I, II, III and Section B: Units IV, V, VI.

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Course Code: BSH171 **Credits: 1**

Course: Basic Electronics Engineering

Teaching Scheme: **Term Work: 50 Marks**

Practical: 2 hrs/week

Objectives	1) To give knowledge of some electronic devices and circuits. 2) To study Logic gates and their usage in digital circuits. 3) To introduce basic aspects of transducers and electronic communication systems with their applications.
List of Practical	1. Different Measuring Instruments. i) To study different controls of DMM and measurement of parameters like AC and DC voltage, current ii) To study controls of CRO, Measurements of frequency, AC and DC Voltages. iii) To study various controls of a signal generator. 2. Different Electronic Components. i) Resistors (Carbon Film, Metal Film, Wire Wound, Variable) ii) Capacitors (Electrolytic, Mica, Ceramic, Variable) iii) Inductors, Transformers iv) Connectors, Switches 3. PN Junction Diode. i) Identify pins PN Junction diode and study of its datasheet specifications. ii) Plot graph of VI Characteristics of PN Junction diode. 4. Regulated Power Supply. For a given Regulated Power Supply circuit with bridge Rectifier, Capacitor filter and three terminal regulators: i) Identify pins of rectifier diode (such as 1N4001) and Study of its datasheet Specifications. ii) Identify pins of three pin Regulator (such as LM78XX or LM79XX) and Study of its datasheet Specifications. To measure voltages and observe waveforms at transformer secondary, output of Bridge Rectifier, Output of Regulator. 5. Single stage BJT Common Emitter Amplifier Circuit. i) Identify pins of BJT (such as BC547) and study of its datasheet specifications. ii) To measure voltage and observe waveforms at input and output terminals of Single stage BJT Common Emitter amplifier circuit. 6. FET Drain Characteristics. i) Identify pins of FET and study of its datasheet specifications. ii) Plot Drain Characteristics of FET. 7. Op-Amp based Amplifiers Circuits. i) Identify pins of an Op-Amp (such as LM741). ii) Implement given voltage equation for two inputs with Op-Amp based Summing and Difference amplifier (such as $V_o=2V_1+3V_2$, $Vo=4V_1-V_2$).

	8. Digital Circuits. i) Identify pins of Digital Logic Gates ICs such as AND, OR, NOT, Ex-OR, NAND & NOR. ii) Verify truth table of Logic Gates. iii) Implement Half Adder and Full Adder circuit with basic Logic gate ICs 9. Measurement of displacement using LVDT. 10. Displacement measurement using Strain gauge. 11. Pressure Measurement using Bourdon tube. 12. Study of Basic Communication Systems.

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Course Code: BSH172 **Credits: 1**
Course: Engineering Mechanics
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) Knowledge of various systems of forces. 2) To understand the scope of graphical methods of Civil Engineering. 3) To study fundamentals and to impart knowledge about role of statics and dynamics.
List of Practical	**Part I : Graphical Solutions (Two Problems each)** 1. Resultant of Concurrent and Non- Concurrent Coplanar Force System 2. Beam Reaction 3. Analysis of Pin-jointed Trusses **Part II : Laboratory Experiments (Any Six)** 1. Parallelogram Law of Forces 2. Lami's Theorem 3. Beam Reactions 4. Member Forces in Trusses 5. Jib Crane 6. Moment of Inertia of Fly Wheel 7. Simple Screw Jack

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Course Code: BSH173 **Credits: 1**
Course: Basic Mechanical Engineering
Teaching Scheme: **Term Work: 50 Marks**
Practical: 2 hrs/week

Objectives	1) To understand fundamental concepts and engineering applications of thermal engineering. 2) To understand working principle of machine tools. 3) To understand the functions of various power transmitting elements.
List of Practical	1. Demonstration of low pressure boiler (any one). 2. Demonstration of high pressure boiler (any one). 3. Demonstration of 2 stroke and 4 stroke petrol engine. 4. Demonstration of 2 stroke and 4 stroke diesel engine. 5. Demonstration of domestic refrigerator. 6. Demonstration of window type air conditioner. 7. Demonstration of Lathe machine. 8. Demonstration of Milling machine. 9. Demonstration of Shaper machine. 10. Demonstration of Radial drilling machine. 11. Assignment on Unit I,II,IV and VI.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
(Faculty of Engineering & Technology)
Syllabus of F. Y. B. Tech (All)

Course Code: BSH126
Course: DOS - I **Credits: 1**
Teaching Scheme:
Practical: 2 hrs/week **Practical Assessment: 50 Marks**

Objectives	1) Students will be able to define communication process and soft skills. 2) Students will be able to communicate to an individual or in team with both verbal and written form. 3) Students will be able to deliver presentation.	
List of Practical	**Unit-I**	**An Introduction to Communication and Key Concepts in Communication** An Introduction to Communication, Basic terms, concepts, and contexts of communication, Factors influencing message encoding, the nature of messages, and message uses and effects, Importance, Types and Principles of Communication, General Vs Technical Communication. **(02 h)**
	Unit-II	**Grammar and Vocabulary** Tenses and the Concept of Time, Active and Passive Constructions, Prepositions and Conditionals, Vocabulary Building **(08 h)**
	Unit-III	**Listening Skills** Introduction to Listening, Purpose and Types of Listening, Active Listening V/s Passive Listening, Difference among Listening, Hearing and Overhearing, Traits of a good listener, Barriers to effective listening and Tips for effective listening. **(02 h)**
	Unit-IV	**Speaking Skills** Phonetics and problems in learning and using pronunciation, Vowel sounds, Consonant Sounds, Word accent, Sentence Intonation, Conversation skills in different situations. **(04 h)**
	Unit-V	**Reading Skills** An Introduction to Reading and Comprehension, Types and Techniques - Skimming and Scanning of Reading, Inferencing in Reading, Reading data in various forms **(02 h)**
	Unit-VI	**Writing Skills** Introduction to Writing and Importance of effective writing, Paragraph Development, Coherence - Topic Sentence, Supporting Sentence, Authentication, and Examples, Letter Writing, Application Writing. **(04 h)**

Reference Books	**Sr. No.**	**Title**	**Author**	**Publication**

	1	The Essence of Effective Communication	Adrian Budday, Ron Ludlow and Fergus' Panton	Prentice Hall of India-Private Ltd.
	2	Communicating in Style	Yateendra Joshi	The energy Resource Institute
	3	Effective Technical Communication	Anne Eisenberge	Mc Graw Hill International Editors
	4	Professional Communication Skills	A. K. Jain, Pravin, S. R. Bhatia, A. M. Sheikh	S. Chand & Company Ltd.
	5	Business Communication	Urmila Rai, S. M. Rai	Himalya Publishing House
	6	Developing Communication Skills	Mohan and Banerjee	Macmillan India Limited, 2000
	7	Better English Pronunciation	J. D. O'Connor.	Cambridge University Press
	8	Professional Communication Skill	Pravil S. R. Bhatia, S. Bhatia	S. Chand & Co
	9	Living English Structure	Allan Walter	Longman
	10	Communication Techniques & Skills	R.K. Chadha	Dhanpat Rai Publications
	11	Technical Communication- Principles and Practice	Meenakshi Raman & Sangeeta Sharma	Oxford University Press
	12	A course in Phonetics & Spoken English	J. Sethi, P. V. Dharmatma	PHI publication
	13	Communication Skills for Engineers	Sunita Mishra, C. Murli Krishna	Pearson Education
	14	Communication Skills	Leena Sen	PHI
	15	Technical Communication A Reader Centered Approach	Paul V. Anderson	Thomson Publication
	16	Grammar of Spoken and Written English	Dauglas Biber, Geoffrey Leech	Longman
	17	A Practical English Grammar	A.J. Thomson & A.V. Martinet	Oxford University Press
	18	Oxford English Grammar	Sydney Greenbaum	Oxford University Press