

UNIVERSITY OF MUMBAI

Revised Scheme and
Syllabus
for the F.E. (Sem.– II)
Examination

(With effect from the academic year 2007-2008)

Scheme for F.E. Sem : II (w.e.f.Year 2007-2008)

Sr. No.	Subject	No. of Periods per week (60 minutes each)			Duration of Theory papers (Hours)	Marks				
		Lecture	Practical	Tutorial		Theory	Term work	Practical (2 Hrs.)	Oral	Total
1.	Applied Mathematics-II	04	--	01	03	100	25	--	--	125
2.	Applied Physics - II	03	01	--	02	75	25	--	--	100
3.	Applied Chemistry - II	03	01	--	02	75	25	--	--	100
4.	Communication Skills	03	--	02	03	100	25	--	25@	150
5.	Engineering Drawing	03	04	--	02	50	25	50	--	125
6.	Computer Programming-II	04	02	--	03	100	25	25	--	150
7.	Basic Workshop Practice	--	04	--	--	--	50	--	--	50
Total =		20	12	03	--	500	200	75	25	800

@ Presentation should be given by students in the subject of communication skills marks allotted to them on presentation.

First Year Engineering (Semester I & II) (Revised) Course for
Academic Year 2007-08
(Common for all branches)
Revised Scheme for Semester I

Sr. No	Subjects	No. of Periods per week (60 minutes each)			Duration of Theory Papers (Hours)	Marks				
		Lecture	Practical	Tutorial		Theory	Term-work	Practical (2 Hrs.)	Oral	Total
1	Applied Mathematics - I	04	--	01	03	100	25	--	--	125
2	Applied Physics – I	03	01	--	02	75	25	--	--	100
3	Applied Chemistry – I	03	01	--	02	75	25	--	--	100
4	Engineering Mechanics	05	02	--	03	100	25	25	--	150
5	Basic Electrical & Electronics Engineering	05	02	--	03	100	25	25	--	150
6	Computer Programming – I	03	02	--	03	100	25	--	--	125
7	Basic Workshop & Practice - I	--	04	--	--	--	50	--	--	50
	Total..	23	12	01	--	550	200	50	--	800

University of Mumbai

Class – F.E. (all Branches of Engineering)
Subject – Applied Mathematics -II

Semester – II

Periods per week (01 Period of 60 minutes)	Lecture	4	
	Practical	--	
	Tutorial	1	
		Hours	marks
Evaluation System	Theory Examination	3	100
	Practical and Oral Examination	--	--
	Oral Examination	--	--
	Term Work	--	25
	Total		125

Details of Syllabus –

Sr. No.	Detailed Syllabus:	Hrs
	<p>Prerequisite: - Idea of curve tracing in Cartesian. Parametric and Polar forms. Standard curves such as Straight lines. Circles, Parabolas. Hyperbola, Catenary, Cycloid, Astroid, Cycloid, Lommscate of Bernoulli, Cardioid, concept of Solid Geometry- Planes, Spheres, cones, Cylinders, Paraboloids,</p>	02
2.1	<p>Beta and Gamma functions, Differentiation under integral sign. 2.1.1 Definition of Beta and Gamma functions and properties 2.1.2 Relation between Beta and Gamma functions (with proof), duplication formula (with proof) 2.1.3 Differentiation under the integral sign with constant limits of integration.</p>	06
2.2	<p>Differentiation Equations of first order and first degree 2.2.1 Exact differential equations and those which can be reducible to the exact form by using integrating factors (four rules) 1. Homogeneous differential equations 2. $F(x)ydx + g(x)y^2dy = 0$ $\frac{\partial M}{\partial N} = \frac{\partial N}{\partial M}$ 3. $LF = e^{\int f(x)dx}$ where $f(x) = \frac{\partial y}{\partial x} \frac{\partial x}{\partial N - \partial M}$ 4. I.F. + $e^{\int g(y)dy}$ where $g(y) = \frac{\partial x}{\partial M} \frac{\partial M}{\partial y}$</p>	04
	<p>2.2.2 Linear differential equations and differential equations reducible to the linear form</p>	03
	<p>2.2.3 Numerical solutions of differential equations using Taylor's series method.</p>	01

2.3	Numerical solutions of differential equations of first order and first degree, Differential equations of order n. 2.3.1 Euler's method, Modified Euler's method, Runge Kutta method of 4 th order. Comparison of numerical solutions with the exact solutions. 2.3.2 Linear differential equations with constant coefficients-Complimentary functions, particular integrals of differential equations of the type $f(D)y=X$ where X is e^{ax} , $\sin(ax+b)$, $\cos(az+b)$, x^n , $e^{ax} V$, x^V	03 03
2.4	Linear Differential equations with variable coefficients. Method of variation of parameters and Rectification. 2.4.1 Cauchy's homogeneous Linear differential equation and Lavender's differential equation. 2.4.2 Method of variation of parameters 2.4.3 Simple application of differential equations of first and second order to electrical and mechanical engineering problems (no formulation of differential equation) 2.4.4 Rectification of plane curves	02 01 02 02
2.5	Integral Calculus-Double Integrals 2.5.1 Double Integration-Definition, geometrical interpolation properties and evaluation. 2.5.2 Evaluation of double integrals by changing the order of integration and changing to polar form.	03 06
2.6	Integral Calculus-Triple Integral and application of double and triple integrals, computer oriented techniques. 2.6.1 Triple Integration- definition and evaluation (Cartesian, Cylindrical and Spherical polar coordinates), concept of Jacobians. 2.6.2 Applications of double integrals to compute Volume 2.6.3 Computer oriented techniques in problem solving using Scilab.	03 03 02

Theory Examination:

1. Question paper will comprise of total 7 questions, each of 20 marks.
2. Only 5 questions need to be solved.
3. Q, 1 will be compulsory and based on entire syllabus
4. Remaining questions will be mixed in nature (e.g. suppose Q.2 has part (a) form, module 3 then part (b) will be form any module other than module3)
5. In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Term Work.

- Attendance (Theory and Theory) : 05 Marks
- Tutorials covering entire portion : 05 Marks
- Programming Assignments using Scilab : 05 Marks
-Curve Tracing. Intersection of surfaces. evaluation of double and Triple Integrals. Solution of Differential equations of 1st order and 1st degree
- Test (at least one) : 05 Marks

25

- The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term –work.

Recommended Books:

- Higher Engineering Mathematics. Dr. B.S. Grewal. Khanna Publications
- Differential Equation. Ross.. wiley India. 3rd Ed.
- A textbook of Applied Mathematics, P.N. & J.N. Wartikar. volume 1 & @ . Pune vidyarthi Griha.
- Advanced Engineering Mathematics. Erwin Kreyszing. wiley India 8th Ed.
- Elementary Differential Equation, E.d. rainville. P.E & R.E Bedient. Prentice Hall, 8th edition.

University of Mumbai

Class – F.E. (all Branches of Engineering)
Subject – Applied Physics -II

Semester – II

Periods per week 01 period of 60 minutes	Lecture	3	
	Practical	1	
	Tutorial	--	
		Hours	marks
Evaluation System	Theory Examination	2	75
	Practical	--	--
	Oral Examination	--	--
	Term Work	--	25
	Total		100

Details of Syllabus –

Sr. No.	Details	Hrs
Module-01	<p>Optics:</p> <ul style="list-style-type: none"> ▶ Interference in thin films, wedge shaped films and Newton's rings, applications of interference. ▶ Fraunhofer diffraction through double slit and diffraction grating. grating spectra, resolving power of grating. ▶ Total internal reflection materials & types of optical fibres. numerical aperture, modes of propagation, v-number, attenuation, dispersion & other losses in fibres, applications. 	12
Module-02	<p>LASERS:</p> <ul style="list-style-type: none"> ▶ Absorption, spontaneous & stimulated emission, population inversion, metastable state, pumping schemes, active medium, resonant cavity, derivation for Einstein's coefficients. ▶ He-Ne laser, Nd:UAG laser, semiconductor diode laser introduction to molecular and tuneable lasers. ▶ Application of lasers to holography, Memory reading and writing & other applications. 	08
Module-03	<p>Foundations of Quantum mechanics:</p> <ul style="list-style-type: none"> ▶ de' Broglie's hypothesis, group & phase velocity, wave packet. uncertainty principle & its applications. ▶ Wave function and probabilistic interpretation. one dimensional time dependent Schrödinger equation. reduction to time independent form. application to free particle and particle in a box. ▶ Introduction to quantum computing. 	06
Module-04	<p>Magnetic Materials & circuits:</p> <ul style="list-style-type: none"> ▶ Atomic origin of magnetization, magnetic moment of atom diamagnetism. Langevin's theory of paramagnetism and curie's law' theory of ferromagnetism. ▶ Magnetic circuits, magnetomotive force, reluctance. permeance, Ohm's law for magnetic circuit, relation between mmf & "H", magnetic circuit due to solenoid, Hysteresis. ▶ Ferrites, soft and hard magnetic materials and their applications. 	06
Module-	Bio- Physics.	

05	<ul style="list-style-type: none"> ▶ Introduction and scope molecular modeling, energy transfer & energy cycles, biomechanics, neurobiophysics. ▶ Tools spectroscopy- UV/Visible. IR , use of NMR microscopy- SEM, 	04
Module-06	<p>Vacuum technology:</p> <ul style="list-style-type: none"> ▶ Basic definitions, units, low, high and ultrahigh vacuum, methods of production ▶ Vacuum pumps- rotary, diffusion. vacuum gauges piram penning thermocouple ▶ Application to thin films. , microelectronics. Nanotechnology. plasma physics 	04

Theory Examination:

1. Question paper will comprise of total 7 questions, each of 15 marks.
 2. Only 5 questions need to be solved.
 3. Q, 1 will be compulsory and based on entire syllabus
 4. Remaining questions will be mixed in nature (e.g. suppose Q.2 has part (a) form, module 3 then part (b) will be form any module other then module3)
- In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Term Work.

Term work shall consist of minimum five experiments and a written test. The distribution of marks for term work shall be as follows:

- Laboratory work (Experiments and journal) : 10 Marks
- Test (at least one) : 10 Marks
- Attendance (Theory and Theory) : 05 Marks
- Total : 25 Marks
- The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term –work.

Suggested Experiments: Applied Physics II.

- 1) Newton's rings
- 2) Wedge-shaped film
- 3) Mercury spectrum using grating – determination of wavelengths
- 4) Determination of grating element with laser source.
- 5) Divergence of laser beam
- 6) Numerical Aperture of optical fibre
- 7) Optical fibre – attenuation coefficient.
- 8) Determination of Planck's constant by photocell.
- 9) Hysterisis loop of magnetic materials
- 10) Study of basic low or high vacuum system

Recommended Books:

1. Fundamentals of Physics, Holliday/ Resnick white India 6th edi.
2. Fundamentals of optics, Jenkins & white Me Graw-Hill Int.
3. Understanding Physics, Cummins, wiley India
4. Modem Engineering physics A S Vasudeva S shand
5. A textbook of Engineering Physics – Kshirsagar & Avadhanulu, S Chand Pbl
6. Quantum mechanics – Bransden & Jochain, Wiley Eastern.
7. Vacuum technology – A Roth
8. Bio-Physics – Vasantha Pattabhi & N Gautham, Narosa Pbl.

University of Mumbai

Class – F.E. (all Branches of Engineering)

Semester – II

Subject – Applied Chemistry -II

Periods per week 01 period of 60 minutes	Lecture	3	
	Practical	1	
	Tutorial	--	
		Hours	marks
Evaluation System	Theory Examination	2	75
	Practical	--	--
	Oral Examination	--	--
	Term Work	--	25
	Total		100

Details of Syllabus –

Sr. No.	Details	Hrs
Module-01	<p>Corrosion :</p> <ul style="list-style-type: none"> • Nernst theory, Standard Electrode potential, types of corrosion Dry or chemical corrosion wet or electrochemical corrosion Electrochemical, Galvanic cell, Concentration cell, Intergranular Stress cell corrosion Polarization, Over voltage. Factors affecting rate of corrosion. • Methods to decrease the rate of corrosion, Cathodic and Anodic Protection, Cathodic and Anodic coatings. Advanced coatings and protection methods, Only constituents and their function of a) Paints b) Varnishes c) Lacquors d) Enamels. • Metallic coatings: Methods of coating and study only electroplating method. Corrosion engineering of electronic and photonic devices. 	8
Module-02	<p>Alloys:</p> <ul style="list-style-type: none"> • Alloys, Types of alloys, alloys of Al, Cu & Pb. Their composition properties and uses. Recent advances in alloy related materials • Powder Metallurgy Methods of metal powder formation, Metal ceramic powders Technology of Powder metallurgy. Applications of powder metallurgy. 	06
Module-03	<p>Fuel</p> <ul style="list-style-type: none"> • definition classification, characteristic properties of a good fuel Calorific value, gross and Net calorific value, conversion. Proximate and ultimate analysis of fuels, combustion calculations for requirement of oxygen and air for given solid, liquid gaseous fuel. • Liquid fuels: Crude petroleum oil, classification Separation and purification of Gasoline from crude oil. Thermal cracking Catalytic cracking. Fixed bed, moving method for obtaining gasoline. • Diesel, Bio diesel, methods to obtain bio diesel, production of ethanol using bio-mass production of hydrocarbons from plants, Knocking, Octane value. antiknocking agents and their function recent technology for catalytic converter. 	10

Module-04	Composite Materials: • Introduction. Constitution, Characteristic properties classification Particle, fiber, reinforced composites structural composites, • Application of composite materials	05
Module-06	Green chemistry: • Introduction, Goals Significance, Basic ideas in the field of green chemistry research with 3 examples. • Industrial applications of green chemistry.	05
Module-07	Catalysis: • Introduction, Importance of catalysts and adsorbents in industry, Activation energy and catalysts. • Molecular design for catalysts and adsorbents, Molecular design by nature-Zeolites, zeotypes, pillared clays, Metal complexes and clusters, Oxide materials carbon materials, membranes.	06

Theory Examination:

1. Question paper will comprise of total 7 questions, each of 15 marks.
2. Only 5 questions need to be solved.
3. Q, 1 will be compulsory and based on entire syllabus
4. Remaining questions will be mixed in nature (e.g. suppose Q.2 has part (a) form, module 3 then part (b) will be form any module other then module3)
In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Term Work.

Term work shall consist of minimum five experiments and a written test. The distribution of marks for term work shall be as follows:

- Laboratory work (Experiments and journal) : 10 Marks
- Test (at least one) : 10 Marks
- Attendance (Theory and Theory) : 05 Marks
- Total : 25 Marks**
- The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term –work.

List of Expts:

1. Estimation of Cu iodometrically
2. Estimation of Zn complexometric titration
3. Estimation of Ni complexometric titration
4. Estimation of Al complexometric titration
5. Calorific value of solid or liquid fuel using Bomb Calorimeter
6. Preparation of membranes for filter any one Demon
7. CO₂ from air by orsats method
8. Estimation of Fe by gravimetric method
9. Estimation of Ni by gravimetric method
10. Estimation of Sn iodometrically
11. Estimation by iodometrically
12. Preparation of biodiesel from edible oil
13. Synthesis of simple layered materials and their characterization
14. Preparing simple composites and their characterization

Recommended Books:

1. Engineering Chemistry – Jain & Jain Dhanpat Rai
2. Basic Inorganic Chemistry, Cotlon, Wiley India, 3rd ed.
3. Engineering Chemistry – Dara & Dara, S Chand
4. Materials Science & Engg – William Callister
5. Chemistry of advanced materials – CNR Rao, RSC Pbl
6. Membrane Filtration – Gutman, Adam Hilger
7. Physical Metallurgy – B.K. Agarwal

University of Mumbai

Class – F.E. (All Branches of Engineering)
Subject – Communication Skill - II

Semester – II

Periods per week 01 period of 60 minutes	Lecture	2	
	Practical	--	
	Tutorial	2	
		Hours	marks
Evaluation System	Theory Examination	2	75
	Practical	--	--
	Oral Examination	--	25
	Term Work	--	25
	Total	--	125

Details of the Syllabus –

Sr. No.	Details	Hrs
Module-01	Communication Theory <ul style="list-style-type: none"> • Concept and meaning of communication, Objectives of communication. Methods of communication, Communication in a business organization (Internal, upward, downward horizontal, grapevine), Problems and solutions. 	08
Module-02	Techniques to improve communication <ul style="list-style-type: none"> • Speaking (Phonetics), Writing, Reading and Listening. Introduction to Modern Communication Media, Netiquette, conferencing-Introduction, Importance, Techniques. 	05
Module-03	Summarization and Comprehension. <ul style="list-style-type: none"> • Techniques to comprehend and summarize a given technical, scientific or industry oriented text, Questions to test analytical skills and expressions. (to test the ability to present the written matter in a brief and concise manner) 	03
Module-04	Vocabulary. Grammar & Aptitude test.	03
Module-05	Basic Official Correspondence. <ul style="list-style-type: none"> • Principles of correspondence, Language and style in official letters. formats of letters (Complete block, Modified Block, semi-Block form), Types of letters (Enquiry, Reply to enquiry, Placing an order, claim and Adjustments). 	08
Module-06	Basic Technical Writing. <ul style="list-style-type: none"> • framing definitions, Writing instructions, Types of expositions (description and explanation). 	03

Theory Examination:

1. Question paper will comprise of total 7 questions, each of 15 marks.
2. Only 5 questions need to be solved.
3. Q, 1 will be compulsory and based on entire syllabus
4. Remaining questions will be mixed in nature (e.g. suppose Q.2 has part (a) form, module 3 then part (b) will be form any module other then module3)
 In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Tutorials:

Topics to be assigned for speech practice to test diction. Modulation, fluency and non verbal communication

Practice for group discussion

Writing Assignments.

Term Work. 25 Marks

Each student to appear for at least one test during the term.

Term work shall consist of graded answer paper of the test and at least 06 hand assignments (1 assignment per module).

- Written test : 10 Marks
- Assignments : 10 Marks
- Attendance : 05 Marks

Oral Communication

(Only Internal Assessment for oral examination): 25 Marks.

10 marks for public speaking

15 marks for group Discussion.

Recommended Books:

1. Business communication, Lesikar and Petit: Mc Graw-Hill Publications. 1995
2. Communication Skills Handbood, summers, Wiley India.
3. Business Communication, (Revised Edition), Rai And Rai, Himalaya Publishing House
4. Business correspondence and report writing, R.C. Sharma and Krishna Mohan, tata McGraw-Hill, 2002 3rd edition.
5. English for Engineers and Technologists: A skills approach (Books 1 & 2) course authors (Humanities& social Sciences division, Anna University Madras) Orient Longman.
6. Modern Business Correspondence, Mc-commas and Satterwhite; Sixth Edition. McGraw- Hill publications.
7. Technical Writing and Professional communications, Huckins, Thomas, McGraw-Hill
8. Contemporary Business communication, Scott Ober, Wiley India.
9. Written Communication, Sarah , Orient Longman.

University of Mumbai

Class – F.E. (all Branches of Engineering)
Subject – Engineering Drawing

Semester – II

Periods per week (01 Period of 60 minutes)	Lecture	3	
	Practical	4	
	tutorial	--	
		Hours	marks
Evaluation System	Theory Examination	3	75
	Practical	2	50
	Oral Examination	--	--
	Term Work	--	25
	Total		150

Details of the Syllabus –

Sr. No.	Topics	Hrs
01	Module 1 • Introduction: Drawing instruments. symbolic lines. letterings. dimensioning systems as per I.S conventions, geometrical constructions and tangential arcs.	02
02	Module 2 Projections: • Projection of points and lines inclined to both the reference planes including HT & VT. • Projection of right regular solids (cube, prism, pyramid, cylinder and cone) inclined to both HP & VP (excluding spheres, hollow and composite solids). • Development of surface (excluding reverse development)	02 06 03
03	Module 3: Sections: Section of solids (cube, prism, cylinder, cone) cut by plane perpendicular to at- least one reference plane (excluding curved cutting planes)	04
04	Module 4: Orthographic projections: • Multi-view orthographic projections of simple machine parts by first angle method as recommended by Indian standards. • Sectional views of simple machine parts(full section and half section only) • Reading of orthographic projections (missing views)	04 04 06
05	Module 5: Isometric projections: Isometric projection/drawings of blocks (plain and cylindrical excluding spheres)	04

06	Module 6: • Engineering Curves: Parabola, Ellipse, Hyperbola, cycloid and involutes Free hand sketches of fasteners Thread profile – IS conventions of external and internal threads. drilled hole blind hole and tapped hole Bolts, Nuts, Set screws, Foundations bolts and locknuts,	03
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Term work:

Term work shall consist of the following:

PART I: Drawing sheet

Five drawing sheets to be prepared on half imperial drawing sheet:

(TO be completed in 30 Hrs.)

Sheet No.1: Curves (2 problems) & projections of lines (2 problems)

Sheet No. 2: Projections of solids (2 problems) & section of solids (1 problem)

Sheet No.3: Orthographic projections (1 problem) & sect. ortho. Projections (1 problem)

Sheet No.4: Reading of orthographic projections (2 problems)

Sheet No.5: Isometric view (2 problems) & free hand sketches of fasteners.

Home –Work: one sketch book, A-3 consisting of minimum 3 problems from each module. Duly signed sketch book is part of term –work.

PART II: Computer Aided Drawing (Auto –CAD)

Practice on Auto –cad: Theory and practice to be completed during practical sessions.

Sr. No.	Topic	No of Hours
1	Introduction to Auto –Cad	06
2	Fundamental of 2 –D Constructions	04
3	Orthographic projections	06
4	Sectional orthographic projections	06
5	Reading of Orthographic projections	04
6	Fundamental of 3 –D drawing Isometric view	04

Printout of problems solved in the practical class to be attached in the Term work
(on Sr. No. 3 4.5 & 6)

Theory Examination:

1. Question paper will comprise of total 7 questions, each of 15 marks.
2. Only 5 questions need to be solved.
3. Q, 1 will be compulsory.
4. Remaining questions will be mixed in nature (e.g. suppose Q.2 has part (a) form, module 3 then part (b) will be form any module other then module3)
5. No. question to be asked from Module 1

In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Practical Examination:

Practical examination will be based on Part II of the list Term Work (Practice on Auto –Cad)

Term Work.

- The distribution of marks for term work shall be as follows,
 - Part I & Part II work (Drawing sheets, sketch book and Printouts) : 10 Marks
 - Test (at least one) : 10 Marks
 - Attendance (Practical and Theory) : 05 Marks
 - **Total** : 25 Marks.
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- The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term –work.

Recommended Books:

1. Elementary Engineering drawing, N.D Bhatt, Charotar Publishing house.
2. Mastering auto CAD, G.Omura by Sybers (Autodesk Press), Wiley India.
3. Understanding AutoCAD, Sham Tiekou, Autodesk Press, Wiley India.
4. Machine Drawing, N.D Bhatt, Charotar Publishing house.
5. Engineering Drawing, M.B. Shah and B.C.Rana.
6. Engineering Graphics with Auto –Cad 2007 by James D.Bethune, 1st Edition, Pearson Education.

University of Mumbai

Class – F.E. (All Branches of Engineering)
Subject –Computer Programming - II

Semester – II

Periods per week 01 period of 60 minutes	Lecture	4	
	Practical	2	
	Tutorial	--	
		Hours	marks
Evaluation System	Theory Examination	3	100
	Practical & Oral Examination	3	25
	Oral Examination	--	--
	Term Work	--	25
	Total	--	150

Details of the Syllabus –

Sr. No.	Detailed Syllabus: CP –II (Object Oriented Programming in JAVA)	Hrs
Module-01	<p>Introduction to Java</p> <ul style="list-style-type: none"> • Characterizing Java as a enabler of contemporary software engineering paradigms- as a platform, simple Programming Environment, Object-Oriented, Platform Independent, Safe. High Performance, Java is Multi-Threaded, dynamically linked, Java is Garbage Collected • Saving files on Windows, compiling and Running • Increment and decrement operators • Print statements, variables and Data Types, Comments • Command line arguments • Objects, Static Fields, Methods • Passing Arguments to Methods; Returning values from methods. 	05
Module-02	<p>Primitive Data Types in Java</p> <ul style="list-style-type: none"> • Java Operators, Literals, Identifiers. key words in Java • Addition of Integers in Java, Multiplication and division in Java • The Remainder or Modulus Operator in Java • Operator Precedence in Java, Mixing Data Types • Converting Strings to Numbers, The char data type in Java • The if, else, else-if statement in Java • The While loop, The for loop, The do while loop in Java • Booleans, Relational Operators, relational Operator Precedence • Break, Continue, The switch statement in Java • The? : operator in Java , Logical Operators in Java <p style="text-align: center;">Object Oriented Programming</p> <ul style="list-style-type: none"> • Constructing objects with new, Methods, Invoking Methods • Implied this , Member Variables vs. Local Variables • Passing Arguments to Methods, Returning Multiple Values From Methods, constructors • Access Protection, The four Levels of Access Protection 	15

Module-03	Arrays as a Data Structure in JAVA <ul style="list-style-type: none"> • Declaring Arrays, Creating Arrays, Initializing Arrays • System array copy () • Multi-dimensional arrays • Strings • Vectors • Exceptions • Try –catch • The finally keyword • Catching multiple exception • The throws keyword. Throwing exceptions 	10
Module-04	Inheritance <ul style="list-style-type: none"> • Inheritance : the superclass • Multilevel Inheritance • final and abstract keyword • Interfaces • Implementing Interfaces • Overriding Methods • Adding Methods • Subclasses and Polymorphism • To String () Methods • Using to siring() Methods • Rules for to String() Method • Static Members 	05
Module-05	Multithreaded programming <ul style="list-style-type: none"> • Creating threads. extending the thread class • Stopping and blocking a thread • Lifecycle of a thread • Using thread methods, thread exceptions. thread priority • Synchronization • The Java Packages & Class Library • Wrapping Your Own Packages • Naming Packages • Documentation for the class library • Importing classes • Package Imports • Name conflicts when importing packages • The java lang package • The lang Math , java util vector, java lang String, Java util Random, java util Hashtable java util date java util calendar. 	10
Module-06	HTML <ul style="list-style-type: none"> • Attributes , URLs, Links • Applet • The APPLET Element, Naming Applets • JAR Archives, The OBJECT Element • Passing Parameters to Applets • the Basic Applet Life Cycle, init(), start(), stop(), and destroy() • The coordinate system, Graphic Objects. Loading Images • Code and Document Bases, Drawing Images at Actual Size • Scaling Images, Coior, fonts. 	05

Term Work.

The work shall consist of graded answer paper of the test and at least five take – home assignments. 15 marks debugged program listing demonstrating Object oriented constructs and concepts. Programs should be debugged (hand written or computer printouts) and should have suitable comments.

Each student is to appear for at least one written test (preferably o-line) during the term.

The distribution of term work mark shall be as follows:

- Written test (at least one) : 10 Marks
- Attendance: (Practical and Theory) : 05 Marks
- Documentation of assignments and Debugged program : 10 Marks
(Laboratory work)

Recommended Books:

Text books

- 1 Computing concepts with java 2 essentials by CAY HORSTMANN 2 Edition WILEY INDIA ISBN 81-265-0931-9
2. Programming with JAVA Primer, E Balagurusamy 3rd Edition, Tata McGRAW –Hill, ISBN 0-07-061713-9

Reference books:

- 1 Big java by CAY HORSTMANN ,, 2 Edition, WILEY INDIA ISBN 81-265-0879-5
- 2 The Complete reference JAVA , Herbert schildt, Seventh Edition , Tata McGRAW –Hill, ISBN 0-07-063677-X.

University of Mumbai

Class – F.E. (All Branches of Engineering)
Subject – Workshop practice -1

Semester – I

Periods per week (each of 60 minutes)	Lecture	--	
	Practical	4	
	tutorial	--	
		Hours	marks
Evaluation System	Theory Examination	--	--
	Practical	--	--
	Oral Examination	--	--
	Term Work	--	50
	Total		50

University of Mumbai

Class – F.E. (All Branches of Engineering)
Subject – Workshop practice -I

Semester –I

Periods per week (each of 60 minutes)	Lecture	--	
	Practical	4	
	tutorial	--	
		Hours	marks
Evaluation System	Theory Examination	--	--
	Practical	--	--
	Oral Examination	--	--
	Term Work	--	50
	Total		50

Detailed Syllabus:-

Periods per week

Sr. No.	Details	Hrs
Note:	<p>The syllabus and the Term-work to be done during Semester I & Semester II are given together.</p> <p>Jobs for practice and demonstration and spread the work over entire two semesters. The objective is to impart training to help the students develop skill sets for creating entities from primitive engineering materials and establishing connections through wires and cables. This exercise also aims in inculcating respect for physical work and hard labor in addition to some amount of value addition by getting exposed to interdisciplinary engineering domains. The two compulsory trades (Sr.No1 & 2) shall be offered in separate semesters. Select any four trade topics (two per semester) out of the topic at Sr. n. 3 to10. Demonstrations and hands on experience to be provided during the periods allotted for the same. Report on the demonstration including suitable sketches is also to be included in the term-work.</p>	

1	<p>Fitting (Compulsory)</p> <ul style="list-style-type: none"> • Use and setting of fitting of setting of fitting of fitting tools for chipping, cutting, filing, marking, center punching, tapping drilling • Term work to include one job involving following operation: Filing to size one simple male-female joint, drilling and tapping 	24
2	<p>Carpenter (Compulsory)</p> <p>Use ad setting of hand tools like hacksaws, jack planes, chisels and gauges for construction of various joints, wood turning modern wood turning methods.</p> <p>Term work to include one carpentry job involving a joint and a report on demonstration of a job involving wood turning.</p>	24
3	<p>Forging (Smithy)</p> <p>At least one workshop practice job (Lifting hook and handle) is to be demonstrated.</p>	12
4	<p>Welding</p> <p>Edge preparation for welding jobs. Arc welding for different job like Lap welding of two plates, butt welding of plates with simple cover, arc welding to join plates at right angles.</p>	12
5	<p>Machine Shop</p> <p>At least one turning job is to be demonstrated.</p>	12
6	<p>Electrical board wiring</p> <p>House wiring, staircase wiring for fluorescent tube light, go-down wiring and three phase wiring for electrical motors.</p>	12
7	<p>PCB Laboratory Exercises</p> <p>Layout drawing, Positive and negative film making PCB etching and drilling, Tinning and soldering techniques.</p>	12
8	<p>Sheet metal working and Brazing</p> <p>Use of sheet metal, working hand tools, cutting, bending, spot welding</p>	12
9	<p>Plumbing</p> <p>Use of plumbing tools, spanners, wrenches, threading dies, demonstration of preparation of a domestic plumbing line involving fixing of a water tap and using of coupling, elbow, tee, and union etc</p>	12
10	<p>Masonry</p> <p>Use of masons tools like trowels, hammers, spirit level, square, plumb, line and pins etc. Demonstration of mortar making, single and one and half brick masonry, English and Flemish bonds, block masonry, pointing and plastering.</p>	12

Term work:

Term work shall consist of respective reports and jobs of the trades selected

The distribution of marks for term work shall be as follows, (per semester)

Laboratory work (Job and Journal) : 40 marks

Attendance (Practical and Theory) : 10 marks

The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term-work.