SCHOOL OF ARCHITECTURE, SCIENCE AND TECHNOLOGY
YASHWANTRAO CHAVAN MAHARASHTRA OPEN UNIVERSITY

DETE

Detail Syllabus for Semester 01 and 02 of
V63: Diploma in Electronics and Telecommunication Engineering
(DETE) {2012 Pattern}

2012

AST, YCMOU, Nashik – 422 222, MS, India

CONTENTS

V63: Diploma in Electronics and Telecommunication Engineering {2012 Pattern}

Basic Information

1. **Mode of Education**: Full time face-to-face mode enhanced with ELearning support.
2. **Minimum Programme Duration**: 4 years after SSC (10^{th})
3. **Required Study Efforts**: 600 Hours in **each** semester
4. **Medium of Instruction**: English
5. **Attendance**: Minimum 80% attendance for all courses.
6. **Equivalence Status**:
    - UGC recognized and approved
    - DEC recognized and approved
    - Recognized by Government of Maharashtra for MPSC jobs
    - Equivalence with respective MSBTE Diploma will be sought before launch

Programme Calendar

SN	Activity Description	Odd semesters like 01, 03, 05 and 07 From 01-Aug Till 31 Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Annual Admission			
01	Further Admission	From 05-Jun Till 05-Jul	Not Offered
02	Fresh Admission	From 05-Jun Till 05-Aug	Not Offered
Teaching – Learning			
03	Teaching - Learning	From 01-Aug Till 13 Nov	From 01-Feb Till 16-May
04	Teaching–Learning Backlog Clearing	From 14-Nov to 04-Dec	From 17-May to 04-Jun
End Exam (EE) Form Submission			
05	EE Form Submission by students at SC	On or Before 30-Sep	On or Before 31-Mar
06	EE Form Submission by SCs at University	On or Before 05-Oct	On or Before 05-Apr
Continuous Assessment (CA) Submission			
07	CA Availability on website	From 01-Aug Till 30 Nov	From 01-Feb Till 30-May
08	CA Submission by Students at SC	01-30 Nov	01-30 May
09	Provisional CA Report by SCs	On or before 31-Dec	On or before 30-Jun
10	Final CA Report Submission by SCs at University	On or before 31-Jan	On or before 31-Jul
End Examination (EE)			
11	EE for Theory Courses	From 05-Dec Till 14-Dec	From 05-Jun Till 14-Jun
12	EE for Practical, STW, SV or PW Courses	Immediately after the last day of end exam for theory courses, but positively before 05-Jan	Immediately after the last day of end exam for theory courses, but positively before 05-Jul
Semester End Vacation			
13	Semester End Vacation	From 08-Jan Till 31-Jan	From 08-Jul Till 31-Jul

Eligibility and Fees

Admission Eligibility	Certification Eligibility	Fees and Deposit / Semester		
		Desc	**INR**	**USD**
SSC (10^{th}) or Equivalent Exam passed from recognized board	Min 50% or better marks in total 40 courses (subjects) of total 160 credit points at Semesters 01-08 Aggregate performance and Class in the programme shall be reported on the basis of **only** semesters 07 and 08.	UF	☐ 3,600	US$ 360
		SCF	☐ 8,400	US$ 840
		EF (Only for repeat attempts. Included in UF for first compulsory attempt)	☐ 100 / T ☐ 200 / TW ☐ 300 / P ☐ 400 / PW	US$ 10 / T US$ 20 / TW US$ 30 / P US$ 40 / PW
		Total	☐ **12,000**	US$ **1,200**
		AAFA	☐ 7,200	US$ 720
		LD	☐ **2,000**	US$ **200**

SEMESTERS AND COURSES

All courses at "both semesters at each year" shall be finalized in phased manner.

V63 – DETE – All Course Codes starts with T04.

SN	Code	Name	CA	EE	TM	Type	CP	Min%
Semester 01: 20 CPs, Foundation Courses								
01	T04011	Basic Science	20	80	100	T	4	50%
02	T04012	Basic Mathematics	20	80	100	T	4	50%
03	T04013	Technical Communication	20	80	100	T	4	50%
04	T04014	TC, PP and Soft-Skills	20	80	100	TW	4	50%
05	T04015	Computer Basics and Basic Science	20	80	100	P	4	50%
Semester 02: 20 CPs, Foundation Courses								
06	T04021	Applied Science	20	80	100	T	4	50%
07	T04022	Applied Mathematics - 1	20	80	100	T	4	50%
08	T04023	Electronic Components and Applications	20	80	100	T	4	50%
09	T04024	Workshop Practice (Programme Specific)	20	80	100	TW	4	50%
10	T04025	Applied Science and Engineering Drawing – 1	20	80	100	P	4	50%
Semester 03: 20 CPs, Basic Courses								
11	T04031	Basic Electronics	20	80	100	T	4	50%
12	T04032	Applied Mathematics - 2	20	80	100	T	4	50%
13	T04033	Basic Electrical Engineering	20	80	100	T	4	50%
14	T04034	Programming in 'C'	20	80	100	TW	4	50%
15	T04035	Basic Electronics and Electrical Engineering	20	80	100	P	4	50%
Semester 04: 20 CPs, Basic Courses								
16	T04041	Applied Electronics	20	80	100	T	4	50%
17	T04042	Digital Electronics	20	80	100	T	4	50%
18	T04043	Analog Communication	20	80	100	T	4	50%
19	T04044	Digital Electronics and Industrial Measurement	20	80	100	TW	4	50%
20	T04045	Applied Electronics and Analog Communication	20	80	100	P	4	50%
Semester 05: 20 CPs, Core Courses								
21	T04051	Linear Integrated Circuits	20	80	100	T	4	50%
22	T04052	Microcontroller	20	80	100	T	4	50%
23	T04053	Digital Communication	20	80	100	T	4	50%
24	T04054	Microcontroller and Entrepreneurship Development	20	80	100	TW	4	50%
25	T04055	Linear Integrated Circuits and Digital Communication	20	80	100	P	4	50%
Semester 06: 20 CPs, Core Courses								
26	T04061	Power Electronics	20	80	100	T	4	50%
27	T04062	Electronics Instruments and Measurement	20	80	100	T	4	50%
28	T04063	Advance Communication System	20	80	100	T	4	50%
29	T04064	Electronics Instruments & measurements and Power Electronics	20	80	100	TW	4	50%
30	T04065	Video Engineering and Advance communication system	20	80	100	P	4	50%
Semester 07: 20 CPs, Advance and elective Courses								
31	T04071	Data Communication Networking	20	80	100	T	4	50%
32	 T04072 T05072	**Elective - I** : Any **one** of following courses Antenna & Microwave Engineering Biomedical Instrumentation	20	80	100	T	4	50%
33	 T04073 T05073	**Elective – II** : Any **one** of following courses Mobile Communication Embedded System and Design	20	80	100	T	4	50%
34	T04074	Data Communication and Seminar	20	80	100	TW	4	50%
35	T04075	**Elective- I** and **Elective- II** Practical	20	80	100	P	4	50%
Semester 08: 20 CPs, Advance and elective Courses								
36	T04081	Management Science	20	80	100	T	4	50%
37	 T04082 T05082	**Elective-III** : Any **one** of following courses Telecommunication Switching Systems Control System	20	80	100	T	4	50%
38	 T04083 T05083	**Elective – IV** : Any **one** of following courses Satellite Communication VLSI Techniques	20	80	100	T	4	50%
39	T04084	Project-Work	20	80	100	PW	4	50%
40	T04085	Elective-III and Elective-IV Practical	20	80	100	P	4	50%

Evaluation Pattern

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment</th><th>End Examination</th></tr>
<tr><td>1</td><td>Theory (T)</td><td>1. Student is required to answer 1 of 1 SAQ, each of 5 marks, on each CP
2. Single attempt only
3. Marks: 20 Marks
4. Duration: Specified 1 Month</td><td>1. Student is required to answer 1 of 1 SAQ, each of 5 marks, on each CP
2. Student is required to answer 1 of 2 LAQs, each of 15 marks, on each CP
3. Maximum 5 Attempts only
4. Marks: 80 Marks
5. Duration: 180 minutes</td></tr>
<tr><td colspan="4"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination</th><th>Marks</th></tr>
<tr><td>1</td><td>Question Type</td><td>1 Short Answer Question (SAQ) /CP, and
1 out of 2 Long Answer Question (LAQ)/CP,</td><td>5 Marks /CP,
15 Marks/CP</td></tr>
<tr><td>2</td><td>Total</td><td>Section A : CP 1 - 1 SAQs and 1 out of 2 LAQs and
CP 2 - 1 SAQs and 1 out of 2 LAQs
Section B : CP 3 - 1 SAQs and 1 out of 2 LAQs and
CP 4 - 1 SAQs and 1 out of 2 LAQs</td><td>80 Marks</td></tr>
</table></td></tr>
<tr><td>2</td><td>Practical</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each CP in the prescribed format.
2. Single Attempt only
3. Marks: 20 Marks
4. Duration: Specified 1 Month</td><td>1. External and internal examiners shall assess each student based on:
a. Continuous Assessment submission by the student (Only by External Examiner) [20 Marks]
b. Practical Activity performed by the student [40 Marks]
c. Viva on Practical Activities [20 Marks]
2. Maximum 5 Attempts only
3. Marks: 80 Marks
4. Duration: 180 minutes</td></tr>
<tr><td colspan="4"><table>
<tr><th rowspan="2">SN</th><th colspan="3">Evaluation of Practical End Examination</th></tr>
<tr><th>Description</th><th>Internal Examiner</th><th>External Examiner</th></tr>
<tr><td>1</td><td>Workbook, Diagram, synoptic Answers, Graph/Observation and Conclusion</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of Practical</td><td>20 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva/Oral</td><td>10 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Total</td><td>30 Marks</td><td>50 Marks</td></tr>
</table></td></tr>
<tr><td>3</td><td>Term Work (TW)</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each CP in the prescribed format.
2. Single Attempt only
3. Marks: 20 Marks
4. Duration: Specified 1 Month</td><td>1. External and internal examiners shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [20 Marks]
b. Viva on Activity Report [60 Marks]
2. Maximum 5 Attempts only
3. Marks: 80 Marks
4. Duration: 180 minutes</td></tr>
<tr><td colspan="4"><table>
<tr><th rowspan="2">SN</th><th colspan="3">Evaluation of Project Work End Examination</th></tr>
<tr><th>Description</th><th>Internal Examiner</th><th>External Examiner</th></tr>
<tr><td>1</td><td>Workbook submission</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Viva/Oral</td><td>30 Marks</td><td>30 Marks</td></tr>
<tr><td>3</td><td>Total</td><td>30 Marks</td><td>50 Marks</td></tr>
</table></td></tr>
<tr><td>4</td><td>Project Work (PW)</td><td>5. Student is required to submit “Activity Report in Project Report Format” for each CP in the prescribed format.
6. Single Attempt only
7. Marks: 20 Marks
8. Duration: Specified 1 Month</td><td>5. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [30 Marks]
c. Viva on Project Report[30 Marks]
6. Maximum 5 Attempts only
7. Marks: 80 Marks
8. Duration: 180 minutes</td></tr>
<tr><td colspan="4"><table>
<tr><th rowspan="2">SN</th><th colspan="3">Evaluation of Project Work End Examination</th></tr>
<tr><th>Description</th><th>Internal Examiner</th><th>External Examiner</th></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Presentation</td><td>15 Marks</td><td>15 Marks</td></tr>
<tr><td>3</td><td>Viva/Oral</td><td>15 Marks</td><td>15 Marks</td></tr>
<tr><td>4</td><td>Total</td><td>30 Marks</td><td>50 Marks</td></tr>
</table></td></tr>
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Actual CA and EE marks shall be used in computation of “Total Marks (TM)”. Only best of the past performance shall be reported.

SEMESTER 01

T04011: BASIC SCIENCE

PROGRAMME INFORMATION

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

COURSE INFORMATION

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04011	Basic Science	4	45	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA): 20 Marks
2. End Examination (EE): 80 Marks

PRESUMED KNOWLEDGE AND LEARNING OBJECTIVES

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to **Part I: Basic Physics** • Apply Basic Facts, Concepts, Principles and Techniques of Scientific Investigation of Physical Quantities and Processes which are used in Technology **Part II: Basic Chemistry** • Comprehend the mechanism of electrolysis • Explain properties of metals, non- metals & alloys related to engineering applications • Use metallic and non-metallic materials in engineering applications

UNITS

UN	Name of the Unit	CSs	Questions
Part I : Basic Physics			
01 02 03 04	Elasticity Surface Tension Viscosity Transmission of Heat and Expansion of Solids	**CP 01** **CSs** **TL: 01-12** **CA: 13-15**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
05 06 07	Gas laws and Specific Heats of Gases Sound Properties of Light	**CP 02** **CSs** **TL: 16-27** **CA: 28-30**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
Part II : Basic Chemistry			
08 09	Atomic Structure Electrochemistry	**CP 03** **CSs** **TL: 31-42** **CA: 43-45**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
10 11	Metals and Alloys Non-Metallic Materials	**CP 04** **CSs** **TL: 46-57** **CA: 58-60**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

DETAIL SYLLABUS

UN	Detail Syllabus of the Unit	CP Block
Part I : Basic Physics		

01	**Elasticity:** Introduction, Elasticity, Plasticity and Plastic Body, Molecular Theory of Elasticity, Stress, Strain and Their Types, Elastic Limit and Hooke's Law, Types of Modulus Elasticity, Behavior of Wire Under Continuously Increasing Load, Factor of Safety	
02	**Surface Tension:** Introduction- Molecular Force, Cohesive Force, Adhesive Force, Laplace's Molecular Theory of Surface Tension, Angle of Contact and its Significance, Capillarity or Capillary Action, Shape of Liquid surface in a Capillary Tube, Surface Tension of Liquid in a Capillary Tube, Effect of Impurity and Temperature on Surface Tension of Liquid	
03	**Viscosity:** Introduction, Fluid Friction, Viscous Force, Viscosity, Newton's Law of Viscosity, Flow of Liquid through a Tube – Streamline Flow and Turbulent Flow, Significance of Reynolds's number, Free Fall of Spherical Body Through Viscous Medium and Stokes Law, Up Thrust force, Terminal Velocity, Stokes Law	**CP 01**
04	**Transmission of Heat and Expansion of Solids:** Three Modes of Transmission of Heat, Conduction in detail, Thermal Conductivity and Coefficient of Thermal Conductivity, Expansion of Solids-Definition of linear, aerial and cubical expansion and relation between them	
05	**Gas laws and Specific Heats of Gases:** Introduction, Gas Laws, General Gas Equation and Specific and Universal Gas Constant, Standard or Normal Temperature and Pressure, Concept of Absolute Zero and Absolute Scale of Temperature, Two Specific Heats of Gas and Relation between them, Isothermal and Adiabatic Changes of Gas	
06	**Properties of Light:** Properties of Light- Reflection, Refraction, Dispersion, Polarization, Diffraction, Principle of Superposition of Waves, Interference, Constructive Interference and Destructive Interference, Conditions for Stationary Interference Pattern Optical fibre: principle, structure of optical fiber, propagation of light wave through optical fibre, derivation of numerical aperture and acceptance angle	**CP 02**
07	**Sound:** Concept of Wave Motion, Relation Between Velocity, Frequency and Wavelength, Transverse Wave and its Characteristics, Longitudinal Wave and its Characteristics, Equation of Progressive Wave, Stationary Waves or Standing Waves, Node and Antinode, Forced and Free Oscillations, Resonance, Formula for Velocity of Sound with End Correction	
Part II : Basic Chemistry		
01	**Atomic Structure**: Introduction, Particles of Matter, Dalton's Atomic Theory, Size of an Atom, Thomson's Atomic Model, Rutherford's Scattering Experiment, Drawbacks of Rutherford's Atomic Model, Bohr's Atomic Model, Modern Atom, Composition of an Atom, Rules of Distribution of Electrons in Shells, Energy Levels and sub energy Levels, Atomic Orbitals, Quantum Numbers, Pauli's Exclusion Principle, Hund's Rule and Aufbau's Principle, Electronic Configuration of Atoms, Electronic Configuration of Inert Gas Elements, Isotopes, Isobars, Electronic Theory of Valency, Lewis and Langmuir Concept of Stable Configuration, Concept of Variable Valency, Types of Valency, Electrovalency, Formation of Electrovalent Compounds, Covalency, Formation of Covalent Compounds, Distinction between Electrovalent and Covalent Compounds	
02	**Electrochemistry**: Introduction, Atom and Ions, Ionisation and Electrolytic Dissociation, Arrhenius Theory of Electrolytic Dissociation, Degree of Ionisation, Significance of the Terms Involved in Electrolysis- Such as Conductors, Insulators, Dielectrics, Electrolyte, Non-Electrolyte, Electrolysis, Electrolytic Cell, Electrodes. Electrode Potential and Concept of Electrode Potential such as Reduction Potential and Oxidation Potential, Mechanism of Electrolysis – Primary & Secondary Reactions at Cathode and Anode, Electrochemical Series for Cations and Anions, Electrolysis of CuSo4 Solution by using Cu Electrode & Platinum Electrode, Electrolysis of NaCl Solution and Fused NaCl by using Carbon Electrode, Faraday's Laws of Electrolysis and Numericals, Applications of Electrolysis such as Electroplating and Electro Refining, Electrometallurgy and Electrotyping, Conductivity of Electrolyte, Electrochemical Cells and Batteries- Definition, Types such as Primary and Secondary Cells and Their Examples. - Construction, Working and Applications of i) Dry Cell ii) Lead-Acid Storage Cell	
03	**Metals and Alloys:** **Metals:** Introduction, Characteristics of Metal- Mechanical Properties of metals such as Hardness, Toughness, Ductility, Malleability, Tensile Strength, Machinability, Weldability, Forging, Soldering, Castability. Metalloids, Occurrence of Metals- Mineral, Ore. Metallurgy, Gangue, Flux and Slag, Stages of Extraction of Metals from its Ores in detail-Crushing, Concentration, Reduction, and Refining. Physical Properties and Applications of some commonly used metals such as Fe, Cu, Al, Cr, Ni, Sn, Pb, Zn, Co, Ag, W. **Alloys:** Definition of Alloy, Preparation Methods, Purposes of Making alloy, Classification of Alloys such as Ferrous and Non Ferrous and their examples. Composition, Properties and Applications of Alnico, Duralumin, Dutch Metal, German, Silver / Nickel Silver, Gun Metal, Monel Metal, Wood's Metal, Babbitt metal	**CP 03**
04	**Non Metallic Materials:** **i) Plastics:** What are Plastics?, Polymerisation, Formation of Plastic by Addition and Condensation Polymerisation by giving e.g. of Polyethylene and Backelite plastic Respectively, Structure of Plastics, Types of Plastic- Thermosoftening and Thermosetting Plastic with Definition and Distinction, Compounding of Plastics- Resins, Fillers, Plasticizers, Accelerators, Pigments and their examples, Properties of Plastic, Engineering Applications of Plastic **ii) Rubber:** Rubber, Natural Rubber and Its Processing, Drawbacks of Natural Rubber, Vulcanisation of Rubber with Chemical Reaction, Synthetic Rubber- Definition, Distinction Between Natural and Rubber. Properties of Synthetic Rubber such as Elasticity, Tack, Abrasion Resistant, Stress and Strain, Application of Rubber **iii) Thermal Insulating Materials:** Thermal Insulating Materials, Factors Affecting Thermal Conductivity of Insulators, Characteristics of Good Insulating Materials, Classification of Thermal insulators, Preparation, Properties and Applications - Glass wool, Thermocole, Asbestos and Cork	

LEARNING RESOURCE DETAILS

Important Note- **End exam shall be based on only following types of specified learning resource**:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title	Edition	ISBN

	Author	Year	Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04011-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04011-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
Part I : Basic Physics			
T04011 –RB1	Physics –I V. Rajendran		Tata McGraw-Hill
T04011 –RB2	Engineering Physics B.L. Theraja		S. Chand Publishers – New Delhi
T04011 –RB3	Engineering Physics R.K.Gaur and S.L.Gupta		Dhanpat Rai Publication, New Delhi
T04011 –RB4	Physics- Std XI, Std XII		Physics- Std XI, Std XII
Part II : Basic Chemistry			
T04011-RB5	Engineering Chemistry, Jain & Jain		Dhanpat Rai and Sons
T04011–RB6	Engineering Chemistry, S. S. Dara,		S. Chand Publication
T04011 –RB7	Industrial Chemistry, B. K. Sharma,	1st 2002	Goel Publication
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04011 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04011-WL1			

T04012: Basic Mathematics

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04012	Basic Mathematics	4	45	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA): 20 Marks
2. End Examination (EE): 80 Marks

Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Apply basic facts, concepts, principles and procedures of mathematics as a tool to analyze engineering problems

Units

UN	Name of the Unit	CSs	Questions
01 02 03	Logarithms Partial Fraction Vectors	**CP 01** **CSs** **TL: 01-12** **CA: 13-15**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
04 05	Determinants and Matrices Binomial Theorem	**CP 02** **CSs** **TL: 16-27** **CA: 28-30**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
06 07 08 09 10	Trigonometric Ratios Trigonometric Ratios of Allied, Compound, Multiple & Submultiple Angles Factorization and De-factorization Formulae Inverse Trigonometric Ratios Properties of Triangles	**CP 03** **CSs** **TL: 31-42** **CA: 43-45**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
11 12 13	Point and Distances Straight Line Circle	**CP 04** **CSs** **TL: 46-57** **CA: 58-60**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
01	**Logarithms**: Definition of Logarithm (Natural And Common Logarithm) and Examples based on it, Laws of Logarithm and Examples Based on it	**CP 01**
02	**Partial Fraction:** Definition of Proper and Improper Fractions, Definition of Partial Fractions, To Resolve Proper Fraction into Partial Fraction with Denominator Containing – i) Non Repeated Linear Factors ii) Repeated Linear Factors iii) Non Repeated Irreducible Quadratic Factors, To Resolve Improper Fraction Into Partial Fraction –i) Numerator and Denominator are of the Same Degree Ii) Numerator is of a Degree Higher than that of Denominator	
03	**Vectors:** Definition of Vector, Position Vector, Algebra of Vectors (Equality, Addition, Subtraction and Scalar Multiplication), Dot (Scalar) Product with Properties, Vector (Cross) Product with Properties, Applications of Vectors- Work Done and Moment of Force about a Point and Line	

04	**Determinant and Matrices:** **Determinant-** Definition and Expansion of Determinants of 2^{nd} and 3^{rd} Order, Cramer's Rule to Solve Simultaneous Equations in 2 and 3 Unknowns **Matrices-** Definition of a Matrix of Order m by n, Types of Matrices**,** Algebra of Matrices Such As Equality, Addition, Subtraction, Scalar Multiplication and Multiplication of Two Matrices, Transpose of a Matrix, Minor, Cofactor of an Element of a Matrix, Adjoint of Matrix and Inverse of Matrix By Adjoint Method, Solution Of Simultaneous Equations Containing 2 and 3 Unknowns by Matrix Inversion Method	**CP 02**
05	**Binomial Theorem :** Definition of Factorial Notation, Definition of Permutation and Combinations with Formula, Binomial Theorem for Positive Index, General Term, Binomial Theorem for Negative Index, Approximate Values (Only Formula)-Surds, Progressions	
06	**Trigonometric Ratios:** Trigonometric Ratios of Any Angle**,** Ratios of Special Angles 0^0, 30^0, 45^0, 60^0, Quadrantal Angles, Relation Between Degree and Radian, Fundamental Identities, Examples Based on Fundamental Identities	**CP 03**
07	**Trigonometric Ratios of Allied, Compound, Multiple and Submultiple Angles:** Examples based on Allied, Compound, Multiple and Submultiple Angles (particularly for allied angles- numerical must be done by calculators).	
08	**Factorization and De-factorization Formulae:** Examples based on Factorization and De-factorization Formulae	
09	**Inverse Trigonometric Ratios:** Definition of inverse trigonometric ratios, Principal values of inverse trigonometric ratios, Relation between inverse trigonometric ratios	
10	**Properties of Triangles**: Sine, Cosine, Projection and Tangent Rules, Simple problems based on it	
11	**Point and Distances:** Distance Formula, Section Formula, Midpoint, Centriod of Triangle, Area of Triangle and Condition of Collinearity	**CP 04**
12	**Straight Line:** Slope And Intercept of Straight Line, Equation of Straight Line in i) Slope Point Form ii) Slope-Intercept Form, iii) Two-Point Form iv) Two-Intercept Form v) Normal Form vi) General Equation of Line, Angle Between Two Straight Lines Condition of Parallel and Perpendicular Lines, Intersection of Two Lines, Length of Perpendicular from a Point on the Line and Perpendicular Distance Between Parallel Lines	
13	**Circle:** Equation of Circle in i) Standard Form ii) Centre – Radius Form iii) Diameter Form iv)Two–Intercept Form, General Equation of Circle, Its Centre and Radius, Equation of Tangent and Normal to a Circle	

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04012-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04012-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04012 -RB1	Applied Mathematics G.V. Kumbhojkar	Second 2010-11	C. Jamnadas & Co.
T04012 –RB2	Mathematics for Polytechnic S. P. Deshpande	First Aug 2005	Pune Vidyarthi Griha Prakashan,
T04012 –RB3	Trigonometry S. L. Loney		S. Chand Publication
T04012 –RB4	Higher Algebra H. S. Hall & S. R. Knight		Metric edition, Book Palace, New Delhi
T04012 –RB5	Matrices Ayres		Schuam series, McGraw hill
T04012 –RB6	Engineering Mathematics Grewal B.S.	40th Edition 2009	81-7409-195-5 Khanna Publishers
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04012 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04012-WL1			

T04013: Technical Communication

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04013	Technical Communication	4	45	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA): 20 Marks
2. End Examination (EE): 80 Marks

Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Understand and use the basic concepts of communication and principles of effective communication in professional field • Effectively communicate about any technical matter • Enhance writing skills required for the various types of letters, reports and office drafting

Units

UN	Name of the Unit	CSs	Questions
01 02	Introduction to Communication Types of Communication	CP 01 CSs TL: 01-12 CA: 13-15	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
03 04	Principles of Effective Communication Non Verbal- Graphic Communication-1	CP 02 CSs TL: 16-27 CA: 28-30	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
05 06	Non Verbal- Graphic Communication-2 Written Communictaion-1	CP 03 CSs TL: 31-42 CA: 43-45	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
07	Written Communictaion-2	CP 04 CSs TL: 46-57 CA: 58-60	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
01	**Introduction to communication:** Introduction, Need of Communication, Importance of Communication, Significance of Communication, Definition of Communication, Communication Cycle, Elements of Communication, Stages in the Communication Process - Defining the Context, Knowing the Audience, Designing the Message, Encoding, Selecting Proper Channels, Transmitting, Receiving, Decoding and Giving Feedback	CP 01
02	**Types of Communication:** Introduction, Types of Communication- i) According to Application : Internal-External, ii) According to the Nature of Communication: Formal- Informal, iii) According to Direction: Vertical- horizontal diagonal iv) According to Mode of Communication: Verbal-Nonverbal	

03	**Principles of Effective Communication:** Introduction, Principles of Effective Communication, Communication Barriers and their Overcomes- Physical, Mechanical, Psychological and Semantic, Developing Effective Messages-Thinking about Purpose, Knowing the Audience, Structuring the Message, Selecting Proper Channels, Minimizing Barriers and Facilitating Feedback	**CP 02**
04	**Non Verbal- Graphic Communication-1**: Introduction- The Development of Non Verbal Codes, The importance of Non Verbal Communication, Non-Verbal Codes: Kinesecs, Proxemics, Haptics, Vocalics, Physical Appearance, Chronemics, Artifacts	
05	**Non Verbal- Graphic Communication-2**: Aspects of Body Language, Graphical Communication- Aspects of Graphical Communication, Charts and Graphs, Organizational Charts, Flow Charts, Block Charts, Pie Charts, Graphs, Bar Graphs, Rectilinear Graphs, Multiple Lines Graph, Semi-Log Graph, Tables	**CP 03**
06	**Written Communictaion-1:** Letter Writing, Inquiry Letter, Reply to the Letters of Inquiry, Order letter, Complaint letter, and Adjustment letter, Circular, Notices, and Memorandum	
07	**Written Communictaion-2:** Application Letter with Resume, Report Writing, Minutes of the Meeting, Interviews, Defining and Describing Objects and Giving Instructions	**CP 04**

LEARNING RESOURCE DETAILS

Important Note- **End exam shall be based on only following types of specified learning resource**:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04013-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04013-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04013 -RB1	Developing Communication Skills, Krushna Mohan, Meera Banerji,		Macmillan
T04013 –RB2	Communication Skills, Joyeeta Bhattacharya		Reliable Series
T04013 –RB3	Every Ones Guide to Effective Writing, Jayakaran		Apple publishing
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04013 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04013-WL1			

T04014: TC, PP AND SOFT-SKILLS

PROGRAMME INFORMATION

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

COURSE INFORMATION

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04014	TC, PP and Soft-Skills	4	120	120	100	TW

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '2 online SCORM lectures' at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified,** then '2 face-to-face lectures (each of 45 minutes duration) at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
3. Each Term-Work or Practical session shall be of 240 minutes duration. Remaining time of 195 minutes after initial lectures of 45 minutes shall be used for actual conduct and reporting of Term-work/practical activities during each session.
4. Two session per week, each of 240 minutes duration.

Evaluation Pattern: In total evaluation, Internal Examiner (IE) and External Examiner (EE) shall have 50% weightage. Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA) (Only by IE): 20 Marks
2. End Examination (EE): 80 Marks
    a. Activity Report submission by the student (Only by EE): 20 Marks
    b. Viva on Term-Work Submission by the student: 30 Marks (by EE) + 30 Marks (by IE)

PRESUMED KNOWLEDGE AND LEARNING OBJECTIVES

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Develop reading and listening skills • Enhance writing skills required for the various types of letters, reports and office drafting • Express or communication effectively • Apply techniques of effective time management and appropriate body language • Develop good habits to overcome stress • Obtain information from different sources, organize collected information and share with peers • Prepare a report on industrial visit/ expert lecture • Participate in the team work activities

DETAIL SYLLABUS OF REQUIRED THEORY

UN	Detail Syllabus of the Unit	CP Block
01	**Soft Skills**: Introduction, What are Soft Skills, Importance of Soft Skills, Selling Your Soft Skills, Attributes Regarded as Soft Skills, Soft Skills: Social Soft Skills: Thinking Soft skills: Negotiating, Exhibiting Your Soft Skills, Identifying Your Soft Skills, Improving Your Soft Skills, Will Formal Training Enhance Your Soft Skills, Soft Skills Training, Train Yourself, Top 60 Soft Skills, Practicing Soft Skills, Measuring Attitude, Exercise: Measure Your Soft Skills.	
02	**Know Thyself / Self-Discovery:** Introduction, Importance of Knowing Yourself, Process of Knowing Yourself, SWOT Analysis, Benefits of SWOT Analysis, Using SWOT Analysis, SWOT Analysis Grid, Questions to Complete the Grid, Exercise : Know Yourself	
03	**Developing Positive Attitude:** Introduction, Meaning, Features of Attitudes, Attitude and Behavior, Formation of Attitudes, Change of Attitudes, What Can You do to Change Attitude?, Ways of Changing Attitude in a Person, Attitude in a Workplace, The Power of Positive Attitude, Developing Positive Attitude, Obstacles in Developing Positive Attitude, Staying Positive, Examples of positive attitude, Positive Attitude and its Results, Staying Negative, Examples of Negative Attitude, Overcoming Negative Attitude, Negative Attitude and its Results. Exercise: Measure your Attitude.	
04	**Forming Values:** Introduction, Meaning, What is a Value?, A Core of Values, Values Relating to Education, Values Relating to Self and Others, Values Relating to Civic Responsibilities, Values and Attitudes, Importance of Values, Formation of Values, Types of Values, Terminal and Instrumental Values, Power of Values, Personal Values, Cultural Values, Social Values, Values-some Examples. Exercise: Identify Your Values.	CP 01
05	**Improving Perception:** Introduction, Meaning, Factors influencing Perception, Perceptual Process, Improving Perception, Perception and its Application in Organizations, Exercise: Test your perception.	
06	**Career Planning:** Introduction, Benefits of Career Planning, Guidelines for Choosing a Career, Myths about Choosing a Career, Tips for	CP 02

	Successful Career Planning, Developing Career Goals, Final Thoughts on Career Planning, Things One Should Know While Starting Career and During his Career, Exercise: Test Your Career Interests.	
07	**Art of Listening:** Introduction, What is Listening?, Two Ears-one Mouth, Benefits of Active Listening, Kinds of Listening, Factors that Hamper Listening, Common poor Listening Habits, Advantages of Active Listening, Listening Tips.	
08	**Art of Reading:** Introduction, Reading is a Cognitive Process, Good Readers are what they Read, Benefits of Reading, Different types of Reading, Tips for Effective Reading, The SQ3R Technique, Different Stages of Reading, Rates of Reading, Determining a Student's Reading Rate, Adjusting Reading Rate, Activities for Increasing Reading Rate, Problems With Reading, Becoming an Effective Reader, Exercise: Test Your Reading Skills.	
09	**Art of Speaking:** Introduction, What Makes Communication Important?, Defining Communication, Special Features of Communication, Communication Process, Channels of Communication, Formal Communication Network, Informal Communication Network (Grapevine Communication), Importance of Communication, Barriers to Communication, Tips for Effective Communication, Conversation Tips, What is Presentation?, Tips for Powerful Presentation, Art of Public Speaking, Importance of Public Speaking, Benefits of Public Speaking, Public Speaking Tips, Over Coming Fear of Public Speaking.	
10	**Art of Writing:** Introduction, Importance of writing, Creative Writing, Writing Tips, Drawbacks of Written Communication, Exercise : Test your handwriting	
11	**Art of Writing E-mail:** Introduction: The Mail Magic, Use Appropriate Salutations, Make the Subject Matter Significant, Keep a Dictionary Close By, Use Commas-Use Smileys, When In Doubt, Preface, Include Previous Message, Shorten the file Attachments, Reread Before Pressing The "Send" Button, Be Polite and Reciprocate Good Deeds, Anticipate, Empathize, Understand, What Netiquette?	
12	**Body Language:** Introduction, Body Talk, Voluntary and Involuntary Body Language, Forms of Body Language, Parts of Body Language, Origin of Body Language, Uses of Body Language, Body Language in Building Interpersonal Relations, Body Language in Building Industrial Relations, Reasons to Study Body Language, Improving your Body Language, Types of Body Language, Gender Differences, Female Interest and Body Language, Shaking Hands with Women, Interpreting Body Language, Developing Confidence with Correct Body Language.	
13	**Team Building and Teamwork:** Introduction, Meaning, Aspects of Team Building, Skills Needed for Teamwork, A Model of Team Building, Team Vs Group, Characteristics of Effective Team, Role of a Team Leader, Role of Team Members, Nine Persons a Successful Team Should have, Inter-Group Collaboration, Advantages of Inter-Group Collaboration, Difficulties faced in Inter-Group Collaboration, Factors Shaping Inter-Group Collaboration, Exercise : Test Your Teamwork Skills	
14	**Group Discussion:** Introduction, Meaning of GD, Why Group Discussion?, Characters Tested in a GD, Tips on GD, Types of GD, Skills Required in a GD, Consequences of GD, Behaviour In A GD, Essential Elements of GD, Different Characters in GD, Traits Tested in a GD, GD Etiquette, Areas to be Concentrated while preparing for a GD, Initiating a GD, Techniques to initiate a GD, Non-Verbal Communication in GD, Movement and Gestures to be avoided in a GD, Topics for GD	**CP 03**
15	**Etiquette and Manners:** Etiquette : Introduction, Modern Etiquette, Benefits of Etiquette, Classification of Etiquette, Accompanying Women, Taboo Topics, Proposing the Toast; Manners: Introduction, Poor Manners Noticed in Youth, Why Should you Practice Good Manners?, Practicing good Manners, Manners at the Wheel: Driving, Manners in The Flight, Respecting The Sacred: Visiting Holy Places, Dealing with the Challenged, Attending Funeral, Professional Manners, Social Skills (Manners), Getting along With People, Manners to get respect from others, To sum up, Corporate Grooming Tips, Mind Your Mobile Manners, Annoying Office Habits. Exercise 1 : Test Your Etiquette, Exercise 2 : Test Your Manners	
16	**Preparing CV / Resume:** Introduction, Meaning, Difference Among Bio-Data, CV and Resume, The terms, The Purpose of CV Writing, Types of Resumes, Interesting facts about Resume, CV Writing Tips, CV/Resume Preparation- the Dos, CV/Resume Preparation- the Don'ts, Resume Checkup, Design of a CV, Entry Level Resume, The Content of the Resume, Electronic Resume Tips, References, Power Words, Common Resume Blunders, Key Skills that can be Mentioned in the Resume, Cover Letters -Cover Letter Tips.	
17	**Interview Skills:** Introduction, Why an Interview?, Types of Interview, Interview Panel, Types of Questions Asked, Reasons for Selecting a Candidate, Reasons for Rejecting a Candidate, On the day of Interview, On to the Interview Table, Attending Job fair, Common Mistakes that you wouldn't want to do, Questions the Candidate should not ask during the Interview, Post-Interview Etiquette, How does one Follow Up?, Telephonic Interview, Dress Code at Interview, Typical Questions asked, Interview Mistakes, Quick Tips- How to Present well in Interview, Tips to Make a Good Impression in an Interview, Job Interview-Basic Tips, How to Search for Job Effectively, Interview Quotations.	
18	**Time Management:** Introduction, The 80:20 Rule, Take a Good Look at the People around you, Examine your Work, Sense of Time Management, Time is Money, Features of Time, Three Secrets of Time Management, Time Management Matrix , Analysis of Time Matrix, Effective Scheduling, Grouping of Activities, Five Steps to Successful Time Management, Difficulties in Time Management, Evils of Not Planning, Time Management is a Myth, Overcoming Procrastination Ways to Find Free Time, Time Management Tips for Students, Interesting Facts about Time, Ideal Way of Spending a Day, Time Wasters, Time Savers, Realizing the Value of Time, Time Circle Planner. Exercise : Test Your Time Management Skills	**CP 04**
19	**Stress Management:** Introduction, Meaning, At one Level Stress May be a Positive Aid to Performance, At one Level Stress may be a Negative Aid To Performance, Effects of Stress, Kinds of Stress, Sources of Stress, Few other Common Sources of Stress, Case Study, Behaviour Identified with Stress, Assessing The Existence of Stress, What Are the Signs of Stress?, Spotting Stress in you, Stress Management Tips Teenage Stress, Make the Mornings Memorable, Exercise: Do You Have Same Stress-Prone Habits?	

Detail Practical Activities

Note: Work Book shall consist of a record in the form of a journal consisting of the list of activities, printouts and necessary documentation for the following exercises. Students are expected to perform all activities and get workbook certified from the Practical Lab Instructor

UN	Name of the Practical Activity	CP Block	Questions
	Course Content Covered under 'Detail Syllabus of Required Theory of T04014: TC, PP and Soft-Skills' Course. Based on course content following assignments are suggested which is to be completed in the work-book or Journal	**CP 01**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face
01	Chapter 1: Measure your soft- skills		

02	Chapter 2: Analyze yourself with respect to your strength and weaknesses, opportunities and threats (SWOT analysis) on the basis of the following points: i) Your past experiences, ii) Achievements, iii)Failures, and iv)Feedback from others etc		Viva for end exam on these units.
03	Chapter 6 : Test your career interest		
04	Chapter 13: Explore your teamwork skills		
05	Chapter 14: Discuss a topic in a group and prepare minutes of discussion. Write a report of the topic discussed		
06	Chapter 15 : Test your Etiquettes and manners		
07	Chapter 18: Explore your Time Management skills		
08	Chapter 19: Explore your stress prone habits		
09	Deliver a seminar on the any one topic form your own discipline for 10-12 minutes using presentation aids (Time for presentation 10 min. per student) and submit seminar report of at least 10 pages.	**CP 02**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
10	Conduct an interview of a personality and make a report for the same.		
11	Industry Visit of own discipline to nearby factory/ small scale unit/center be arranged and individual student has to submit a report on it.	**CP 03**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
12	Industry Expert Lecture / Lecture by Professionals on latest topic of own discipline be arranged and individual student has to submit a report on it		
13	Collect and submit a report on Techno-commercial information on any topic of own discipline by an individual student (Sources of data collection may be Technical Journals, Internet, Magazines, Product catalogues, Exhibition & Surveys etc)		
14	**Course Content Covered in T04013: Technical Communication Course. Based on course content following assignments are suggested which is to be completed in the work-book or Journal**		
15	Communication Cycle (With The Help Of Diagram)	**CP 04**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
16	Barriers that obstruct a Particular Communication Situation. (State the type of barrier, and how to overcome them)		
17	Developing a Story or a Paragraph for the given Topic Sentence (in a group of 5- 6 students)		
18	Describing Various Equipment's		
19	Write a Business Letters		
20	Write a Letters of Suggestion		
21	Report Writing		

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04014-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04014-TB1	Soft Skills Dr K Alex	2nd Revised Ed 2011	81-219-3192-4 S Chand & Company Ltd
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04014 -RB1	Soft Skills Dr K Alex	2nd Revised Ed 2011	81-219-3192-4 S Chand & Company Ltd
T04014 –RB2	Developing Communication Skills Krushna Mohan, Meera Banerji		Macmillan
T04014 –RB3	Presentation Skills Michael Hatton (Canada – India Project)		ISTE New Delhi
T04014 –RB4	Time management Chakravarty, Ajanta		Rupa and Company
T04014–RB5	Stress Management Through Yoga and Meditation		Sterling Publisher Pvt Ltd
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04014 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04014-WL1	http://www.mindtools.com		

	http://www.thomasarmstrong.com/multiple_intelligences.php		
	http://www.coopcomm.org/workbook.htm		
	http://www.quickmba.com/strategy/swot/		
	http://managementhelp.org/		
	http://www.ethics.com		

T04015: Computer Basics and Basic Science

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V62	T04015	Computer Basics and Basic Science	4	120	120	100	P

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '2 online SCORM lectures' at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified,** then '2 face-to-face lectures (each of 45 minutes duration) at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
3. Each Term-Work or Practical session shall be of 240 minutes duration. Remaining time of 195 minutes after initial lectures of 45 minutes shall be used for actual conduct and reporting of Term-work/practical activities during each session.

Evaluation Pattern: In total evaluation, Internal Examiner (IE) and External Examiner (EE) shall have 50% weightage. Total evaluation of 100 Marks consist of

2. Continuous Assessment (CA) (Only by IE): 20 Marks
3. End Examination (EE): 80 Marks
   a. Activity Report submission by the student (Only by EE): 20 Marks
   b. Actual Conduct of Practical by the student: 20 Marks (by EE) + 20 Marks (by IE)
   c. Viva on Practical Report/Activity: 10 Marks (by EE) + 10 Marks (by IE)

Presumed Knowledge and Learning Objectives

Part I: Computer Basics

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Understand fundamentals of computer system with various hardware and software components • Use basic features of Windows 7 • Use basic features of MS Word 2010, MS Excel2010 and MS Power Point 2010 • Use basic features of Windows Live Essentials, emails and Internet

Detail Syllabus of Required Theory

UN	Detail Syllabus of the Unit	CP Block
01	**Fundamentals of Computer:** Various Types of Computers: Personal Computer, Personal Digital Assistant, Laptop Computer, Tablet PC with Stylus, Mainframe Computer, Supercomputer ; Computer Hardware : Keyboard, Mouse , Monitor, Printer, Speakers ,Scanner; System Unit : Front Side of the System Unit, Backside of the System Unit, Inside the System Unit; Other Hardware Devices, Computer Software: System Software, Application Software **Introducing Window 7:** Exploring New and Improved Features of Windows 7: The Getting Started Menu, HomeGroup, Jump List ; Aero Peek, Aero Snap, and Aero Shake, Windows Search, Windows Taskbar, Desktop Gadget Gallery , Performance Improvements, Play To, Ribbon, Remote Media Streaming, Windows Touch, Libraries , Internet Explorer 8, Action Centre, Windows Live Essentials, Device Management, Exploring Windows 7 Editions, Installing Windows 7: System Requirements, Fresh Installation, Window7 Upgrade Advisor, Upgrade from Previous Versions of Windows, Windows Update, Starting Windows 7, Getting Help in Windows 7, Logging Off, Restarting, and Shutting Down a System **Exploring the Windows 7 User Interface:** Exploring the Desktop, Working with Desktop Icons, Changing the Properties of the Desktop, Working with Desktop Gadgets. Using the Taskbar, Customizing the Taskbar, Managing an Opened Window, Customizing the Notification Area, Using the Start Menu, Starting a Program , Pinning a Program to the Start Menu, Customizing the Start Menu **Working with Windows Explorer:** Exploring the Windows Explorer Interface: Address Bar, Search Box, Toolbar ,Navigation Pane, Content Pane , Detail Pane, Preview Pane, Menu Bar, Working with Libraries: Exploring Libraries, Creating a New Library; Performing Basic File and Folder Operations: Creating Files and Folders, Renaming Files and Folders, Opening and Viewing the Content of Folders, Copying and Moving Files and Folders, Deleting Files or Folders; Performing Advanced File and Folder Operations: Compressing Files and Folders, Setting File Properties, Searching Files and Folders, Burning Files to a CD or DVD; Working with Recycle Bin: Permanently Deleting Items from Recycle Bin, Recovering Items from Recycle Bin	CP 01

02	**Working with Internet Explorer and Windows Live Essentials:** Working with Internet Explorer: Opening Internet Explorer , Accessing a Web Site, Tabbed Browsing of Web Pages, Printing a Web Page , Managing Favorites , Exploring History, Changing the Home Page, Enabling and Disabling Pop-Ups, Phishing Filter. Using Windows Live Essentials: Downloading and Installing Windows, Live Essentials, Working with Windows Live Messenger, Working with Windows Live Family Safety, Working with Social Sites	
03	**Introducing Microsoft Word 2010:** Exploring New Features of Microsoft Word 2010, Starting Microsoft Word 2010 , Exploring the User Interface of MS Word 2010, Exploring the Common Features of MS; Word application: Mini toolbar, Live preview , Contextual Tab, Key Tips ,Screen Tips; Exploring Tabs in Ribbon: Home Tab, Insert Tab, Page Layout Tab, References Tab, Mailings Tab, Review Tab, View Tab; Saving the Document: Saving a Document in Compatible Format , Saving Document as a PDF File; Creating a New Document : Creating a Blank Document , Creating a Document based on a Template , Opening an Existing Document ,Closing the Document; Quitting from Microsoft Word 2010	
04	**Working with First Document in MS Word 2010:** Preparing the First Document: Setting the Page Margins, Changing the Page Size, Changing the Page Orientation; Working with Text : Adding Text in a Document, Editing Text , Creating Bulleted and Numbered Lists **;** Applying Text Formatting: Changing Font and Font Size of Text, Applying Bold, Italic, and Underline , Applying Strikethrough, Subscript and Superscript , Changing the Color of Text, Copying and Clearing Formatting**;** Applying Paragraph Formatting : Setting Indent for Paragraph, Adding a Paragraph Border **;** Changing the Page Background : Applying a Background Color , Adding Built-In Watermark , Creating and Applying Custom Watermark ; Adding a Page Border**,** Inserting Header and Footer**,** Changing the Document Views **;** Printing the Document : Previewing a Document , Setting Print Options	
05	**Proofreading a Document:** Proofreading a Document, Performing Spelling and Grammar Checks, Using the Thesaurus, Using the word Count Feature, working with the AutoCorrect Option, Restricting Editing in a Document, Inserting and Removing Comments, Reviewing a Document, Tracking Changes, Accepting and Rejecting Changes	
06	**Working with Pictures and Tables:** Working with Graphical Object : Inserting a Picture, Inserting Clip Art , Inserting a Shape, Inserting a SmartArt Graphic , Inserting a WordArt , Performing Advance Operation on Graphical Object : Cropping a Picture, Adding a Border to a Picture, Removing the Background of a Picture , Changing the Brightness or Contrast of a Picture, Setting Height and Width of a Graphical Object , Grouping Objects , Wrapping Text ; Working with Table: Inserting a Table, Adding Rows and Columns in an Existing Table, Changing Rows Height and Columns Width , Merging and Splitting Cells, Splitting a Table, Changing Cell Margins and Cell Spacing , Inserting a Formula , Adding Borders and Shadings	
07	**Introduction to Excel 2010:** Exploring New and Enhanced Features of Excel 2010, Understanding Workbooks and Worksheets, Starting Microsoft Excel 2010, Exploring the Microsoft Excel 2010 User Interface : The File Tab , Quick Access Toolbar , The Title Bar, The Minimize, Maximize/Restore, and Close Buttons ,The Ribbon , The Formula Bar, The Name box , The Worksheet ,Scroll Bars ,The Sheet Tab ,The Status Bar; Exploring the Ribbon : Customizing the Ribbon, Exploring the Excel Options Dialog Box ; Working with Templates: Creating a Workbook by using a Template ,Customizing a Template, Closing a Workbook and Quitting Microsoft Excel 2010, Application	
08	**Working with Worksheets and Cells:** Exploring the Different Types of Data used in Excel: Entering Data in a Worksheet, Saving a Workbook , Opening an Existing Workbook, Managing Worksheets in a Workbook :Adding a New Worksheet, Renaming a Worksheet, Deleting a Worksheet ; Working with Rows and Columns: Inserting Rows and Columns , Deleting Rows and Columns, Describing the Cut, Copy, and Paste Commands : Using the Cut Command ,Using the Copy Command , Using the Paste Command; Formatting Cells : Adjusting the Row and Column of Cells, Working with Fonts , Working with Text Alignment ; Formatting a Worksheet : Setting the Margins in a Worksheet , Inserting Headers and Footers in a Worksheet, Editing a Header and Footer, Printing a Worksheet	**CP 02**
09	**Working with Charts, Smart Art graphics, and Sparklines:** Understanding Charts : Understanding Chart Type , Working with Charts, Working with Chart Options; Working with Smart Art Graphics: Inserting SmartArt graphics in a Worksheet , Adding Text to a SmartArt graphic , Selecting a Style for a SmartArt Graphic; Understanding Sparklines , Working with Sparklines : Creating Sparklines, Changing the Type and Colour of Sparklines, Highlighting Data Points , Deleting Sparklines	
10	**Working with Formulas and Functions:** Exploring the Basic Concepts used in Formulas: Understanding Operators in Formulas,Understanding Operator Precedence , Understanding Cell Referencing; Exploring the Basic Concepts used in Function: Explaining the Function Syntax, Correcting Errors in a Function; Working with Mathematical and Statistical Functions: Using the Product Function , Using the SUM Function, Using the ROUND Function ,Using the AVERAGE Function ; Working with Text Functions: Using the CONCATENATE Function , Using the LEN Function, Using the FIND Function ; Working with Logical Functions : Using the AND Function, Using the IF Function, Using the OR Function ; Working with Financial Functions :Using the PV Function, Using the NPV Function , Using the FV Function, Using the PMT Function, Using the NPER Function ,Using the RATE Function	
11	**Introducing Microsoft PowerPoint 2010:** Exploring Microsoft PowerPoint 2010 Features , Launching Microsoft PowerPoint 2010 , Exploring Microsoft PowerPoint 2010 Interface : Quick Access Toolbar, Title Bar, Minimize, Maximize, and Close Buttons, File Tab, Ribbon, Dialog Box Launcher, Scroll Bar ,Working Area , Slides and Outline Tabs , Slide Pane , Notes Pane, Status Bar, Navigation Pane , Zoom Control ; Exploring the Tabs: The Home Tab, The Insert Tab, The Design Tab, The Transitions Tab,The Animations Tab , The Slide Show Tab, The Review Tab, The View Tab; Creating a Presentation in Different Ways: Creating a Presentation using the Blank Template , Creating a Presentation using an Installed Template, Inserting a New Slide ; Saving a Presentation: Saving Presentation in the Default File Format Saving Presentation as PDF, Getting Help on PowerPoint , Closing the Presentation and Quitting PowerPoint; Exploring PowerPoint Options : General Tab , Proofing Tab, Save Tab ,Language Tab , Advanced Tab, Customize Ribbon Tab, Quick Access Toolbar Tab, Add-Ins Tab, Trust Centre Tab	
12	**Working with a Presentation:** Opening an Existing Presentation, Working with Text: Adding Text Using a Placeholder ,Adding Text Using a Text Box, Adding Current Date and Time , Adding Slide Number, Formatting the Text ,Creating a Bulleted List ; Moving and Deleting Slides: Moving a Slide, Deleting a Slide ; Working with Themes: Adding Themes, Setting a New Font for the Theme , Setting a Theme as a Default Theme	
13	**Inserting Objects in a Presentation:** Adding Charts to a Slide, Working with Clip Arts: Inserting a Clip Art, Modifying a Clip Art ; Working with Images : Inserting an Image, Cropping an Image, Inserting a Shape , Inserting WordArt ; Working with Smart Art Graphics: Inserting a SmartArt Graphic, Converting Text into SmartArt Graphic ; Working with Tables: Inserting a Table , Adding Text in a Table, Deleting a Table; Adding Videos and Sound Clip: Adding a Video, Adding a Sound Clip	
14	**Enhancing the Presentation:** Working with the Transition Effects: Adding a Transition Style ,Adding a Transition Sound, Setting Time Duration of a Slide, Applying the Transition Effect to all Slides, Applying Effects on a Transition; Working with Animation: Adding Animation to an Object , Applying Effects to an Animated Object, Reordering Animation; Creating a Photo Album, Printing a Presentation Sharing a Presentation :Sending a Presentation as an E-mail, Saving a Presentation on the Web ; Converting a Presentation in a Video Format ,Packaging Your Presentation on a CD	

DETAIL PRACTICAL ACTIVITIES

Note: Work Book shall consist of a record in the form of a journal consisting of the list of activities, printouts and necessary documentation for the following exercises. Students are expected to perform all activities and get workbook certified from the Practical Lab Instructor

UN	Name of the Practical Activity [Perform Any 14 Activities)	CP Block	Questions
01	A. **Fundamentals of Computer**: Study various types of computers and review the parts of computer B. **Introducing Window 7:** Install windows 7 and explore new features of windows 7		Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
02	**Working with Windows Explorer** Navigating folders and their contents Staying organized with your own folders Choosing how your folders and user interface behave Sharing and protecting folders and files Simplifying organization with libraries Backing up by burning to CD or DVD		
03	**Exploring the Windows 7 User Interface** Getting familiar with the desktop Handling tasks with the improved task bar Accessing your favorites quickly with jump lists Finding files and programs with Windows Search Using the Action Center Keeping information at your fingertips with desktop gadgets		
04	**Working with Internet Explorer:** Opening Internet Explorer Accessing a Web Site Tabbed Browsing of Web Pages Printing a Web Page Managing Favorites Exploring History Phishing Filter		
05	**Working with Windows Live Essentials:** Setting up your Windows Live profile Downloading Windows Live Essentials Tracking dates and events with the Windows Live calendar Free email with Windows Live Mail Texting live with Windows Live Messenger Organizing and sharing photos in Photo Gallery Controlling content and communications with Family Safety	**CP 01**	
06	**Introducing Microsoft Word 2010:** Word Backstage: From "New" to "Print" Managing documents with Backstage view Creating a new document from a template Making it easy to find and open documents Saving a Word document for yourself or others Printing a document and choosing a printer Setting print options		
07	**Working with First Document in MS Word 2010:** A. Editing Text Selecting text using the mouse and keyboard shortcuts Rearranging text using Cut, Copy, and Paste Undoing and redoing actions Finding and replacing text B. Formatting Text Understanding fonts Working with fonts Applying basic formatting Changing the case of text Using text effects and adding impact to a document C. Formatting Paragraphs Aligning and justifying paragraphs Changing line spacing Using indents and setting tabs Creating a bulleted or numbered list Keeping text together through page breaks Applying shading and borders to paragraphs		

08	**Working with First Document in MS Word 2010:** A. Modifying Page Layout Setting page margins, page orientation, and paper size Inserting sections to organize a document Using columns Using watermarks, page borders, and colors **Proofreading a Document:** B. Proofing Documents Checking spelling and grammar Setting proofing and AutoCorrect options Using the Thesaurus and Research and Translation tools		
09	**Working with Pictures and Tables:** A. Illustrating a Document Illustrating documents with pictures, shapes, and clip art Positioning, sizing, and cropping graphics Wrapping text around graphics Laying out text and graphics with a table Adjusting brightness, contrast, and sharpness of photos Applying special effects to graphics Applying styles to graphics Illustrating with charts: Inserting a chart from Excel Illustrating with diagrams: Using SmartArt Illustrating with screenshots: Capturing screenshots from your computer Illustrating with WordArt B. Working with Tables Creating a table to organize text Converting text to tables Formatting tables for readability Adding and removing columns Sorting table data Merging, splitting, and formatting cells to create a form Converting a table to text Inserting an Excel table for calculations and charts Using Quick Tables		
10	**Working with Worksheets and Cells:** Worksheet Basics Creating a worksheet Techniques for copying and pasting Entering data automatically with Auto Fill Targeting large data groups Changing a worksheet's structure		Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
11	**Working with Formulas and Functions:** Excel Formula Basics Understanding formulas and functions Entering data in a worksheet Adding numbers manually Adding numbers using Sum and AutoSum Adding a whole worksheet Working with numbers in columns Preventing errors using absolute references Working with times and dates Using IF Using SUMIF and AVERAGEIF Naming and using cell ranges	**CP 02**	
12	**Working with Worksheets and Cells:** Essential Formatting Formatting numbers and dates Applying fonts, background colors, and borders Adjusting columns, rows, and text Using conditional formatting Using custom conditional formatting Adding pictures and shapes		

13	**Working with Charts, Smart Art graphics, and Sparklines:** Creating and Using Charts Choosing chart types Inserting Sparklines Creating a column chart Modifying a column chart Creating and modifying a pie chart Placing Excel charts into other Office applications		
14	**Introducing Microsoft PowerPoint 2010:** Adding slides and content Deleting slides and changing layouts Rearranging slides Saving time with Outline mode Separating your show into sections Adding photos and clip art Spell-checking Using the thesaurus Saving a presentation Applying a theme Running the show		
15	**Working with a Presentation:** Formatting a Presentation Using fonts and color Adding bullets and list numbering Changing text alignment Using picture effects Removing backgrounds from photos Understanding slide masters Changing slide backgrounds Adding a logo to the background Applying slide transitions Saving the design template		
16	**Inserting Objects in a Presentation:** A. Adding Tables and Charts Creating tables Formatting tables Pasting tables from Excel Creating charts Pasting charts from Excel B. Adding Audio and Video Adding an audio clip Adding video Cropping video C. Adding SmartArt and Diagrams Adding organizational charts Adding cycle diagrams, Venn diagrams, and other diagrams		

Learning Resource Details

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04015-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04015-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04015 -RB1	Information Technology for Management Henry Lucas		Tata Mc-Graw Hills
T04015–RB2	Computer Fundamentals Architecture and		New Age International Publisher

	Organisation B.Ram		
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04015 -CD1	Comdex Computer Course Kit Vikas Gupta	1st Reprint 2002	Dreamtech, New Delhi
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04015-WL1			

Presumed Knowledge and Learning Objectives

Part II: Basic Science

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to Basic Physics • Verify the principles, laws, using given instruments under different conditions • Interpret the results from observations and calculations Basic Chemistry • Analyze the various solutions used in chemical Laboratory • Interpret the results by observing Chemical Reactions

Detail Syllabus of Required Theory

UN	Detail Syllabus of the Unit	CP Block
01	Course Content Covered in T04011: Basic Science (Part I: Basic Physics course)	CP 01
02	Course Content Covered in T04011: Basic Science (Part II: Basic Chemistry course)	CP 02

Detail Practical Activities

Note: Work Book shall consist of a record in the form of a journal consisting of the list of activities, printouts and necessary documentation for the following exercises. Students are expected to perform all activities and get workbook certified from the Practical Lab Instructor

UN	Name of the Practical Activity	CP Block	Questions
Perform any seven (7) activities from T04011: Basic Science (Part I: Basic Physics course)		CP 01	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units
01	To use Vernier Caliper for the measurement of dimensions of given object.		
02	To use Micrometer Screw Gauge for the measurement of dimensions (Length, Thickness, Diameter) of given object.		
03	To calculate Young's modulus of elasticity of metal (e.g. steel) wire.		
04	To study capillarity phenomenon and to verify that the height of liquid in capillary is inversely proportional to the radius of capillary.		
05	To determine coefficient of viscosity of given liquid or fluid (Glycerin) using Stoke's Method.		
06	To calculate the Linear Thermal coefficient of expansion for copper by using Pullinger's apparatus.		
07	Determine the coefficient of thermal conductivity of copper by Searle's method.		
08	To Verify Boyle's law and to find out atmospheric pressure in the laboratory using graph.		
09	To determine the velocity of sound by using resonance tube.		
10	Determine stiffness constant 'K' of a helical spring.		
11	Determine refractive index of liquid by concave mirror.		
Perform any seven (7) activities from T04011: Basic Science (Part II: Basic Chemistry course)		CP 02	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units
01-05	Perform qualitative analysis of five Solutions, Containing One Basic and One Acidic Radical as Listed below Basic Radicals: Pb^{+2}, Cu^{+2}, Al^{+3}, Fe^{+2}, Fe^{+3}, Cr^{+3}, Zn^{+2}, Ni^{+2}, Ca^{+2}, Ba^{+2}, Mg^{+2}, K^{+}, NH^{4+} Acidic Radicals: Cl^{-}, Br^{-}, I^{-}, CO_3^{-2}, SO_4^{-2}, NO_3^{-}		
06	To Determine electrochemical equivalent of Cu by Using $CuSO_4$ Solution & Copper Electrode		
07	To Determine the % of Fe in the Given Ferrous Alloy by $KMnO_4$ Method.		

08	Determine pH value of given solutions by using pH paper, universal indicator and pH Meter.		
09	To Prepare Phenol Formaldehyde Resin (Backelite).		

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04015-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04015-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
Part I : Basic Physics			
T04011 –RB1	Engineering Physics V. Rajendran		Tata McGraw-Hill
T04011 –RB2	Engineering Physics B.L. Theraja		S. Chand Publishers – New Delhi
T04011 –RB3	Engineering Physics R.K.Gaur and S.L.Gupta		Dhanpat Rai Publication, New Delhi
T04011 –RB4	Physics- Std XI, Std XII		Physics- Std XI, Std XII
Part II : Basic Chemistry			
T04011-RB5	Engineering Chemistry, Jain & Jain		Dhanpat Rai and Sons
T04011–RB6	Engineering Chemistry, S. S. Dara,		S. Chand Publication
T04011 –RB7	Industrial Chemistry, B. K. Sharma,	1st 2002	Goel Publication
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04015 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04015-WL1			

SEMESTER 02

T04021: APPLIED SCIENCE

PROGRAMME INFORMATION

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

COURSE INFORMATION

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04021	Applied Science	4	45	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA): 20 Marks
2. End Examination (EE): 80 Marks

PRESUMED KNOWLEDGE AND LEARNING OBJECTIVES

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to **Part I: Applied Physics** • Understand aspects of kinematics, kinetics, ultrasonic, acoustics, indoor lighting • Basic principles of probing medium used for N.D.T. • Concept used in Nano-technology **Part II: Applied Chemistry** • Understand use of metals & non- metallic materials in engineering field • Analyze Protect Metallic & Non Metallic Surfaces • Apply the knowledge to select lubricants as per application

Special Note: Theory paper will have two parts one for Applied Physics and one for Applied Chemistry. Each will have equal weightage of 50 marks (CA 10 Marks and End Exam 40 Marks).

UNITS

UN	Name of the Unit	CSs	Questions
Part I : Applied Physics			
01 02 03 04	Rectilinear Motion Angular Motion Kinetics Ultrasonic	**CP 01** **CSs** **TL: 01-12** **CA: 13-15**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
05 06 07 08	Non-Destructive Testing of Materials Acoustics Indoor Lighting Introduction of Nano Technology	**CP 02** **CSs** **TL: 16-27** **CA: 28-30**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
Part II : Applied Chemistry			
09 10 11	Electrochemistry Non Metallic Engineering Material Lubricant	**CP 03** **CSs** **TL: 31-42** **CA: 43-45**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
12 13	Metals and Alloys Corrosion	**CP 04** **CSs** **TL: 46-57** **CA: 58-60**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

DETAIL SYLLABUS

UN	Detail Syllabus of the Unit	CP Block
Part I : Applied Physics		
01	**Rectilinear Motion**: Introduction; Important Definitions: Kinematics, Rectilinear Motion, Displacement, Distance, Velocity, Uniform Velocity, Average Velocity, Speed, Acceleration, Uniform Acceleration, Uniform Acceleration; Kinematics Equation of Motion with Uniform Acceleration or Equation of Rectilinear Motion with Uniform Motion: (i)Equation of Motion when Velocity of a Body Moving with Uniform Acceleration after Time 't', (ii)Equation of Motion when Distance (s) Travelled by a Body Moving with Uniform Velocity, (iii)Equation of Motion when Velocity of a Body Moving with Uniform Acceleration after covering a Distance 's', (iv) Equation of Motion when Distance travelled in nth Second by Particle (or Body) Moving with Uniform Acceleration, from these (i),(ii),(iii),(iv) Equations we get four Kinematics Equations of Motion or Equations of Rectilinear Motion with Uniform Acceleration; V-T Diagram; Equations of Rectilinear Motion under Gravity; Problems on Equation of rectilinear Motion; Problems on Equation of Rectilinear Motion under Gravity; Problems on V-T Diagram	
02	**Angular Motion:** Introduction; Definitions of Important Terms: Angular Motion or Circular Motion, Angular Displacement(θ), Angular Velocity (ω), Uniform Angular Velocity, Angular Acceleration (α), Uniform Angular Acceleration; Equations of Angular Motion with Constant Angular Acceleration; Analogy between Equations of Circular Motion and Equation of Rectilinear Motion; Relation between Rectilinear Motion and Angular Motion; Simple Harmonic Motion (S.H.M.); S.H.M. as projections of Circular Motion; Definitions related to S.H.M.; Graphical representation of S.H.M., Graphical representation of Displacement, Velocity, and Acceleration of particle in S.H.M; Examples of Angular Motion; Examples on Relation between Rectilinear Motion and Circular Motion; Problems on S.H.M.	CP 01
03	**Kinetics**: Introduction; Important Definitions: Mass, Momentum, Velocity, Speed, Acceleration, Impact, Impulse or Impulse Force, Impulsive Force (F); Newton's Laws of Motion: Newton's First Law of Motion, Newton's Second Law of Motion, Newton's Third Law of Motion; Law of Conservation of Momentum: Recoil of Gun, Recoil Velocity; Equation of Motion with Uniform Linear Accelerations: Equation of Motion under Gravity; Problems on Momentum and Impulse; Problems on Newton's Laws of Motion; Problems on the Law of Conservation of Momentum; Motion Lift; Motion of two bodies of weight W1 and W2 connected by a string or rope passing over a Frictionless Pulley; Problems on Motion of Lift (Elevator or Cage); Problems on Two Connected Bodies by an Inextensible String or rope Passing Over a Frictionless Pulley	
04	**Ultrasonic:** Ultrasonic Waves: Application, Definition: Ultrasonic Waves, Definition: Infrasonic Waves, Range; Production of Ultrasonic Waves; Magnetostriction Effect; Magnetostriction Method; Piezo-Electric Effect; Piezo-Electric Method; Properties of Ultrasonic Waves; Application of Ultrasonic Waves.	
05	**Non-Destructive Testing of Materials**: Introduction to NDT (Non Destructive Testing); Destructive Testing; Non Destructive Testing: Advantages of NDT, Limitations of NDT, Names of NDT Methods used in Industries, Factors for Selection of NDT; Liquid Penetration Method (Dyepenetrant Test): Principle, Procedure, General Interpretation of results, Liquid Penetrants, Advantages, Limitations, Applications; Magnetic Particle Method (Magnaflux): Principle, Procedure, Advantages, Limitations, Applications, Characteristics of MPT and Factors for Selection; Ultrasonic Testing: Principle, Ultrasonic Test Method, Procedure, Advantages, Limitations, Applications, Precautions	
06	**Acoustics:** Introduction; Frequency of Sound and Limits of Audibility; Pitch/ Loudness/Timbre; Intensity of Sound; Reflection of Sound; Coefficient of Absorption(a); Transmission Coefficient (t); Reflection Coefficient (r); Weber and Fetcher's Law: Intensity Level, Threshold of Audacity, Threshold of Pain; Echo; Reverberation; Reverberation Time; Sabine's Formula for Reverberation Time; Conditions for Good Acoustics; Noise pollution and its Prevention; Factors which affect the Acoustical planning of Auditorium and its Remedy, Remedies to Reduce the Effect of External Noise; Sound Insulation; Solved Problems	CP 02
07	**Indoor Lighting:** Introduction; Important Definitions; Inverse Square Law of Illumination; Illuminance of Obligate Incidence; Principle of Photometry (Equations of Photometry); Bunsen's Photometer: Working, Applications; Indoor Lighting: Need, Lighting Schemes, Factors Affecting the Indoor Lighting, Advantages of Illumination or Lighting System; Solved Problems	
08	**Introduction to Nano Technology:** Introduction; Nanomaterials: Manufacture/Preparation of Nanomaterials; Graphite; Fullerene; Quantum Dots and Quantum Wells; Carbon Nanotubes (CNT's); Properties of Carbon Nanotubes; Application of Carbon Nanotubes; Nanowires; Nanocones; Haeckelites; Applications of Nanomaterials: Medical, Applications in Environmental Technology, Applications in Electronics; General Applications	
Part II : Applied Chemistry		
09	**Electrochemistry:** Conductivity of Electrolytes: Ohm's law, Specific Conductivity or Conductance (k), Equivalent Conductivity (λ_v), Molar Conductivity (λ_m), Measurement of Conductance, Cell Constant, Variation of Specific Conductance with Dilution, Variation of Equivalent Conductance with Dilution; Concept of pH and pOH; Buffer Solutions: Acidic Buffers - Acidic Buffer can be made from Acetic Acid and Sodium Acetate, Basic Buffers – Basic Buffer can be prepared from Ammonium Hydroxide and Ammonium Chloride; Application of pH in Engineering	
10	**Non-Metallic Engineering Materials:** Engineering Plastic and Rubbers: Polyvinyl Chloride (PVC), Polystrene (PS), Bakelite (Phenolplasts or phenolic Resins), Kevlar, Epoxy resins (Polyethers), Polycarbonates (PC), Polyurethanes, Teflon (Polytetrafluroethylene, PTFE) or Fluon, Thermocole, Reclaimed Rubber, Reinforced Plastics or Filled Plastics, Polyvinyl Acetate (Poly Acetals), Silicones; Ceramics: Classification on basis of Application, General properties of Ceramics, Basic Raw Materials; Porcelain; Refractories: Classification, Properties, Applications; Composite Materials: Types of Composites, Advantageous Characteristics of Composite	CP 03
11	**Lubricants:** Introduction; Classification: Solid Lubricants, Semi- solid Lubricants, Liquid Lubricants or Lubricating Oils; Lubrication: Fluid Film or Thick Film or Hydrodynamic Lubrication, Boundary Lubrication or Thin-Film Lubrication, Extreme-Pressure Lubrication; Function of Lubrication; Selection of Lubrication; Characteristics of Lubricants: Physical Properties, Chemical Properties	
12	**Metals and Alloys:** Metallurgy: Crushing, Concentration (or Dressing of the Ore); Ores of Iron: Oxides, Carbonate Ores, Sulphides; Indian Resources of Iron; Manufacture of Pig Iron (Extraction of Iron): Working of Blast Furnace, Operation of Blast Furnace; Products of the Blast Furnace; Commercial Forms of Iron: Pig Iron or Cast Iron, Wrought Iron, Steel; Types of Castings; Heat Treatment: Hardening or Quenching, Tempering, Annealing (Softening), Normalizing; Ferrous Alloys: Steels, Alloys of Steels, Purpose of Alloying Steels, Effects of Alloying Elements on Properties of Steel, Classification of Alloy Steels; Non-Ferrous Alloys: Copper Alloys, Aluminium Alloys (or Light-	CP 04

	Weight Alloys), Bearing Alloys, Solders, Nickel Alloys, Low Melting Alloys	
13	**Corrosion:** Introduction; Types of Corrosion: Atmospheric Corrosion, Factors Affecting Atmospheric Corrosion, Immersed Corrosion (or Electrochemical Corrosion), Mechanism of Electrochemical Corrosion; Protection of Metals from Corrosion: Purification of Metal, Alloy Formation, Cathodic Protection (Making Metal Cathode), Controlling External Conditions, Application of Protective Coatings; Method of Applying Metallic Coating: Hot Dipping, Metal Spraying, Cementation or Diffusion Coatings, Metal Cladding, Electroplating; Non-corrosive Material; Organic Coating: Paints, Lacquers, Enamels, Emulsions Paints, Special Paints	

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

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T04021-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04021-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04021 –RB1	Physics –I V. Rajendran		Tata McGraw-Hill
T04021 –RB2	Applied physics Arthur Beiser		Tata McGraw-Hill
T04021 –RB3	Engineering Physics R.K.Gaur and S.L.Gupta		Dhanpat Rai Publication, New Delhi
T04021 –RB4	Fundamentals of Physics Resnick, Halliday & Walker	8th Edition	Wiley India Pvt. Ltd
T04021 –RB5	Nano technology- principles and practices Dr. S K Kulkarni		Capital publishing company
T04021 –RB6	Engineering Chemistry, Jain & Jain		Dhanpat Rai and Sons
T04021 –RB7	Engineering Chemistry, S. S. Dara,		S. Chand Publication
T04021 –RB8	Environmental Chemistry & Pollution Control, S. S. Dara,		S. Chand Publication
T04021 –RB9	Polytechnic Chemistry, Vedprakash Mehta,		Jain brothers
T04021 –RB10	Industrial Chemistry, B. K. Sharma,	1st 2002	Goel Publication
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04021 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04021-WL1			

T04022: Applied Mathematics-1

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04022	Applied Mathematics-1	4	45	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA): 20 Marks
2. End Examination (EE): 80 Marks

Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Apply basic facts, concepts, principles and procedures of mathematics as a tool to analyze engineering problems

Units

UN	Name of the Unit	CSs	Questions
01 02	Functions Limits	CP 01 CSs TL: 01-12 CA: 13-15	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
03	Derivatives	CP 02 CSs TL: 16-27 CA: 28-30	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
04 05 06	Applications of Derivatives Measures of Central Tendency Graphical Representation	CP 03 CSs TL: 31-42 CA: 43-45	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
07 08	Measures of Dispersion Complex numbers (all branches, MSBTE – Except computer group)	CP 04 CSs TL: 46-57 CA: 58-60	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
01	**Functions:** Introduction, Definitions of Variable, Constant, Intervals such as Open, Closed, Semi-Open etc., Definition of Function, Value of a Function, Range and Domain of a Function, Types of Functions, Illustrative Examples	CP 01
02	**Limits:** Introduction, Concept of Limit, Theorems of Limits, Types of Limits- Algebraic, Trigonometric, Exponential, Logarithmic, Illustrative Examples	
03	**Derivatives:** Concept of Derivative, Definition of Derivative, Different Notations for Derivative, First Principle Method of Finding Derivative of a Function, List of Derivatives of Standard Functions, Rules of Derivatives- Sum or Difference, Product, Quotient, Composite Functions, List of Derivatives of Composite Function at a Glance, Derivatives of Exponential Functions, Derivatives of Logarithmic Functions, Derivatives of Inverse Functions, Derivatives of Implicit Functions, Logarithmic Differentiation, Derivative of Parametric Functions, Derivative of One Functions with respective to Another Functions, Higher Order Derivatives, Illustrative Examples	CP 02

04	**Application of Derivatives:** Introduction, Geometrical Meaning of Derivative(Slope, Gradient), Equations of a Tangent and a Normal to the given Curve, Maxima and Minima, Radius of Curvature, Illustrative Examples	**CP 03**
05	**Measures of Central Tendency**: Introduction, Mean, Median and Mode for raw, ungrouped and grouped Data/frequency distribution, Illustrative Examples	
06	**Graphical Representation**: Introduction, Histogram Construction when Class Intervals are Equal and Unequal, Cumulative Frequency Curve or Ogive Curves to find Median, Illustrative Examples	
07	**Measures of Dispersion**: Introduction, The Range, Mean Deviation, Standard Deviation, Variance, Coefficient of Standard Deviation, Coefficient of Variance, Illustrative Examples	**CP 04**
08	**Complex Number:** Introduction, Definition of Complex Number, Powers of i and Properties of i, Algebra of Complex number- Conjugate, Equality, addition, Subtraction, Multiplication and Division, Graphical representation of a Complex Number (Argand's Diagram)- Modulus of Complex Number, Amplitude of Complex Number, Different Forms of a Complex Number, De-Moivre's Theorem (without proof) Examples based on it, Root of Complex Numbers, Circular Functions of Complex Number, Hyperbolic Functions, Relations between Circular and Hyperbolic Functions	

LEARNING RESOURCE DETAILS

Important Note- **End exam shall be based on only following types of specified learning resource**:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04022-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04022-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04022 -RB1	Mathematics for Polytechnic S. P. Deshpande	First Aug 2005	Pune Vidyarthi Griha Prakashan,
T04022 –RB2	Calculus :Single Variable Robert T Smith		Tata McGraw Hill
T04022 –RB3	Advanced Engineering Mathematics Dass H. K.		S. Chand Publication, New Delhi
T04022 –RB4	Fundamentals of Mathematical Statistics S.C Gupta and Kapoor		S. Chand Publications New Delhi
T04022 –RB5	Higher Engineering Mathematics, Dr B S Grewal,	40th Edition 2009	81-7409-195-5 Khanna Publishers
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04022 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04022-WL1			

T04023: Electronic Components & Applications

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04023	Electronic Components & Applications	4	45	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

4. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
5. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
6. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

3. Continuous Assessment (CA): 20 Marks
4. End Examination (EE): 80 Marks

Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Understand the construction, working principle of the various electronics component • Draw Layout of the electronics Circuits, Designing and testing of the PCB • Understand importance of Surface mount technology • Identify and select electronic components as per specified applications

Units

UN	Name of the Unit	CSs	Questions
01 02	Resistors Capacitors	**CP 01** **CSs** **TL: 01-12** **CA: 13-15**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
03 04 05 06	Inductors Cables Connectors Relays	**CP 02** **CSs** **TL: 16-27** **CA: 28-30**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
07 08 09	Switches Displays Integrated Circuits (IC)	**CP 03** **CSs** **TL: 31-42** **CA: 43-45**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
10 11	Surface Mount Devices (SMD) Printed Circuit Board (PCB)	**CP 04** **CSs** **TL: 46-57** **CA: 58-60**	Students have to answer '1 of 1' SAQ in CA **and** '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
01	**Resistors**: Factors affecting resistance, classification of resistors, Linear and Non-Linear Resistors, Equivalent circuit of resistor, Materials used for resistors, Specifications of resistors, Resistance color coding, Classification of Resistors: 1. **Fixed Resistors**: Carbon Composition Resistors, Carbon Film Resistors, Wire Wound Resistors 2. **Variable Resistors**: a. **Linear**: Potentiometers - Logarithmic and Linear, Trimmer, Rheostat b. **Non-Linear**: Light Dependent Resistors (LDR), Temperature Dependent Resistors (TDR)	**CP 01**

02	**Capacitors**: classification of capacitors, Materials used for capacitors, Dielectric Materials, Specifications of capacitors, capacitor color coding, Equivalent circuit of capacitors, Classification of capacitors: 1. **Fixed capacitors**: Non-Electrolytic capacitors, Disc Ceramic capacitors, Paper capacitors, Mica capacitors, Plastic Film capacitors, Glass Capacitors, Electrolytic capacitors, Aluminum Electrolytic capacitors, Tantalum Electrolytic capacitors 2. **Variable Capacitors**: Requirements, Air-Gang capacitors, PVC Gang capacitors, Trimmer capacitors	
03	**Inductors**: Different Magnetic Materials, Hysteresis, Soft and hard Magnetic Materials and its comparison, Magnetic Material Losses, Hysteresis Losses, Eddy Current Losses, Iron Losses, Faraday's Law of Electromagnetic induction, Induced EMF, Specifications of Inductors, Shielding of Inductors, Testing of Inductors, Inductor color coding, Classification of Inductors: 1. **Fixed Inductors**: Air core Inductors, Iron core inductors, Ferrite Core inductors, comparison of these types 2. **Variable Inductors**: Slug tuned inductors, Tapped inductors **3. Frequency Range Inductors**: AF Chokes, RF Chokes, IF Chokes, Toroidal Inductors	**CP 02**
04	**Cables**: Characteristics, Types, High and low impedance cable, Ribbon cable, High Temperature Cable, Flat Twin Cable, RF Cable, Telephone Cable, FRC Cable, Optical Fiber Cable, Measurement of test parameters, Various test on coaxial cables	
05	**Connectors**: Specifications, Types of connectors - Audio, Phone Plug and Jacks, RF, Video, Printer, RJ-45, Edge, FRC	
06	**Relays**: Characteristics, Types of Relays - Electromagnetic , Reed, Mercury wetted , Comparisons among various types	
07	**Switches**: Specifications, Types of switches - Toggle, Rotary, Rocker, Slide, Push button, Thumb Wheel, Comparisons between Rotary and Slide Switch	
08	**Displays**: LED, Bicolor LED, LCD, LED / LCD comparison , Seven Segment Displays, Common Anode Displays, Common Cathode Displays, 16 Segment Display, 14 Segment Display, Dot Matrix Array, Passive Display, Dynamic Scattering Display, Field Effect Displays, Comparisons between LED and LCDs	**CP 03**
09	**Integrated Circuits (IC)**: Advantages and disadvantages of ICs, IC Applications, **IC Classification** – Analog ICs, Digital ICs, Monolithic ICs, Thin and Thick Film ICs, Hybrid ICs. Thin Film and Thick Film Technology, Comparison among various types of ICs, IC package types and its testing	
10	**Surface Mount Devices (SMD)**: Surface mount technology and fabrication, Advantages and disadvantages of SMDs, **Types of SMDs** – Resistors, Ceramic Capacitors, Tantalum capacitors, Active components, Small Outline Transistors(SOT), Small Outline Integrated Circuits(SOICs), Plastic Leaded Chip Carriers (PLCC), Small Outline J packages(SOJ), Fine Pitch SMD Packages (QFP, SQFP), Ball Grid Array (BGA), Land Pattern of SMDs, Applications of SMDs	
11	**Printed Circuit Board (PCB)**: Types of PCBs, Base and Conducting Materials, Types and Properties of Laminates, Single side PCB. 1. **PCB Layout** – Artwork, Artwork materials, Film Master Production, Reprographic Cameras, Film processing, Artwork check and inspection. 2. **Pattern Transfer** – Etching, PCB Drilling, Component Mounting 3. **Soldering** – Hand soldering, Dip Soldering, Wave soldering, Necessary conditions for good soldering, Solders, Soldering Defects, Safety, Health and Medical aspects of soldering	**CP 04**

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

3. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
4. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

3. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
4. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04023-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04023-TB1			
T04023-TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04023 -RB1	Electronic Components and Materials Madhuri Joshi		Shroff Publishers & Distributors private Ltd
T04023 –RB2	Printed Circuit Boards Walter C.Bosshart		Tata McGraw Hill
T04023 –RB3	Electronic Components and Materials Grover		Dhanpat Rai & Sons
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04023 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04023-WL1			

T04024: Workshop Practice

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04024	Workshop Practice	4	120	120	100	TW

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '2 online SCORM lectures' at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified,** then '2 face-to-face lectures (each of 45 minutes duration) at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
3. Each Term-Work or Practical session shall be of 240 minutes duration. Remaining time of 195 minutes after initial lectures of 45 minutes shall be used for actual conduct and reporting of Term-work/practical activities during each session.

Evaluation Pattern: In total evaluation, Internal Examiner (IE) and External Examiner (EE) shall have 50% weightage. Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA) (Only by IE): 20 Marks
2. End Examination (EE): 80 Marks
   a. Activity Report submission by the student (Only by EE): 20 Marks
   b. Viva on Term-Work Submission by the student: 30 Marks (by EE) + 30 Marks (by IE)

Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Understand basic workshop practice like Wood working, Sheet metal, plumbing and Fitting • Identify, use various tools and equipment's related to Wood working and sheet metal processes • Handle various tools and equipment's used in mechanical, civil, electrical, electronics and computer field for assembly, testing and troubleshooting

Detail Syllabus of Required Theory

UN	Detail Syllabus of the Unit	CP Block
01	**WOOD WORKING SHOP:** Introduction, Various types of woods, Different types of tools, Machines and Accessories.	CP 01
02	**FITTING SHOP:** Introduction**;** Various marking, measuring, cutting, holding and striking tools; Different fitting operation like chipping, filing, right angle, marking, drilling, tapping etc; Working Principle of Drilling machine, Tapping dies its use; Safety precautions and safety equipments	CP 02
03	**SHEET METAL SHOP:** Introduction**;** Various types of tools, equipments and accessories; Different types of operations in sheet metal shop; Soldering and riveting; Safety precautions.	CP 03
04	**Printed Circuit Boards:** Introduction to Printed Circuit Boards(PCB); PCB artwork rules; PCB artwork software C eagle; Preparation of PCB artwork on graph paper and using software; Testing of PCB	CP 04

Detail Practical Activities

Note:

A) Work Book shall consist of a record in the form of a journal consisting of the list of activities, printouts and necessary documentation for the following exercises. Students are expected to perform all activities and get workbook certified from the Practical Lab Instructor

B) i] One job of standard size (Saleable article shall be preferred)

ii] Batch size should be selected depending on volume of work.

iii] Job allotted should comprise of 6-8 hours of actual working

iv] Student shall calculate the cost of material and labor cost for their job from the drawing

UN	Name of the Practical Activity	CP Block	Questions
01	**WOOD WORKING SHOP:** a) Demonstration of different wood working tools/machines. b) Demonstration of different wood working processes, likes plaining, marking, chiseling, grooving, turning of wood etc. c) Demonstration of any one composite job from the following involving different joint, turning and planning, surface finishing by emery paper, varnishing etc. like square stool, tea table, center table, chaurang, table lamp bed sofa-set, book rack. Cabinet, notice board, shows cases, tables chairs, switch board etc d)One job on any one joint like mortise and tenon dovetail, bridle, half lap etc. or similar job from the respective discipline	**CP 01**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
02	**FITTING SHOP:** a) Demonstration of different fitting tools and drilling machines and power tools. b) Demonstration of different operations like chipping, filing, drilling, tapping, cutting etc. c) One fitting job involving practice of chipping, filing, drilling, tapping, cutting etc or similar job from the respective discipline.	**CP 02**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
03	**SHEET METAL SHOP** a) Demonstration of different sheet metal tools/machines b) Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering and riveting c) Demonstration of any one composite job from the following: Letter box, Trunk, Grain Container, Water-heater Container, Waste Paper Basket, Cooler Tray, Water-draining Channel, display board, Switch box, Battery eliminator box etc. (including soldering and riveting) d) One simple job on sheet metal operations and soldering and riveting or similar job from the respective discipline	**CP 03**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
04	**Printed Circuit Boards:** a)Drawing of syllabus/ conventions used in computers, electronic, electrical and mechanical Engineering b) To study PCB artwork rules. c) Prepare PCB artwork for regulated power supply on graph paper. d) Introduction to PCB artwork software C eagle or any OPEN SOURCE PCB artwork Software e) Prepare PCB artwork for regulated power supply using software and prepare negative film of it f) Prepare PCB for regulated power supply (size of PCB such that it can be fitted in metal box prepared in basic workshop practice) g) Testing of PCB	**CP 04**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04024-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04024-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04024 -RB1	Workshop Technology S.K. Hajara Chaudhary		Media Promotors and Publishers, New Delhi
T04024 –RB2	Workshop Technology B.S. Raghuwanshi		Dhanpat Rai and sons, New Delhi
T04024 –RB3	Production Technology R K Jain		Khanna Publishers, New Delhi
T04024 –RB4	Workshop Technology H.S.Bawa		Tata McGraw Hill Publishers,New Delhi
T04024–RB5	Kent's Mechanical Engineering Hand book		John Wiley and Sons, New York
T04024–RB6	Electronic Drafting and Printed Circuit Board Design, Kirkpatrick	1st Rev 1999 SYE	Galgotia Publications,
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04024 -CD1	Learning Materials Transparencies, CBT Packages developed by N.I.T.T.E.R. Bhopal		

05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04024-WL1			

T04025: Applied Science and Engineering Drawing-1

Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nasik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology/Engineering
4	Level	Diploma
5	Course Used in	01. V63: Diploma in Electronics and Telecommunication Engineering 02. V62: Diploma in Mechanical Engineering

Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V63	T04025	Applied Science & Engineering Drawing-1	4	120	120	100	P

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '2 online SCORM lectures' at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '2 face-to-face lectures (each of 45 minutes duration) at the beginning of Term work or Practical session at allotted SC', for 15 weeks in a semester.
3. Each Term-Work or Practical session shall be of 240 minutes duration. Remaining time of 195 minutes after initial lectures of 45 minutes shall be used for actual conduct and reporting of Term-work/practical activities during each session.
4. Two session per week, each of 240 minutes duration.

Evaluation Pattern: In total evaluation, Internal Examiner (IE) and External Examiner (EE) shall have 50% weightage. Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA) (Only by IE): 20 Marks
2. End Examination (EE): 80 Marks
    a. Activity Report submission by the student (Only by EE): 20 Marks
    b. Actual Conduct of Practical by the student: 20 Marks (by EE) + 20 Marks (by IE)
    c. Viva on Practical Report/Activity: 10 Marks (by EE) + 10 Marks (by IE)

Part I: Applied Science

Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to Physics • Understand concept and definition related to Rectilinear motion, Kinetics, SHM, acoustic, Illumination • Verify the principles, laws, using given instruments under different conditions • Interpret the results from observations and calculations Chemistry • Analyze the various solutions used in chemical Laboratory • Interpret the results by observing Chemical Reactions

Detail Syllabus of Required Theory

UN	Detail Syllabus of the Unit	CP Block
01	Course Content Covered in T04021: Applied Science course	CP 01
02		
03		
04	Course Content Covered in T04021: Applied Science course	CP 02
05		
06		
07		

Detail Practical Activities

Note: Work Book shall consist of a record in the form of a journal consisting of the list of activities, printouts and necessary documentation for the following exercises. Students are expected to perform all activities and get workbook certified from the Practical Lab Instructor

UN	Name of the Practical Activity	CP Block	Questions
Perform any seven (7) activities from Applied physics Course			
01	To represent simple harmonic motion with the help of vertical oscillation of spring and to determine spring constant (K) (Stiffness Constant).	**CP 01**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
02	To determine time period of oscillation of compound bar pendulum and calculate acceleration due to gravity (g).		
03	To compare luminous intensities of two luminous bodies by using Bunsen's photometer.		
04	To calculate coefficient of absorption for acoustical materials.		
05	To determine Joule's constant (J) by electric method.		
06	To Verify Ampere's rule using Oersted's Experiment and finds variation of intensity of magnetic field with Current and Distance.		
07	To determine frequency of sound by using sonometer.		
08	To calculate refractive index of material of prism using spectrometer device.		
09	To determine coefficient of thermal conductivity of good conductor by using Searle's method.		
10	To detect surface cracks in the working piece by using liquid penetration method (LPT).		
11	To determine the moments of inertia (I_α and I_β) of the given irregular body and to determine the rigidity modulus of the material of the given suspension wire by setting up a torsional pendulum.		
Perform any seven (7) activities from Applied Chemistry Course		**CP 02**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
12	To determine neutralization point of acetic acid (weak acid) and ammonium hydroxide acid (weak base). To calculated normality and strength of acetic acid.		
13	To determine the equivalent point of precipitation titration of $BaCl_2$ with $H2SO_4$ using conductivity meter. To find the normality and strength of $BaCl_2$ solution.		
14	To verify Faraday's second law of electrolysis.		
15	To determine pH of given solution by using pH paper, universal indicator and pH meter		
16	To determine the strength of given hydrochloric acid solution by titrating it against sodium hydroxide solution by using pH meter.		
17	To determine percentage of copper from brass iodometrically.		
18	To determine thinner content in Oil paint.		
19	To determine acid value of given lubricant.		
20	To determine viscosity of given oil by using Ostwald's viscometer.		
21	To determine the saponification value of given lubricant oil.		

Learning Resource Details

Important Note- **End exam shall be based on only following types of specified learning resource**:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04025-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04025-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04021–RB1	Physics –I V. Rajendran		Tata McGraw-Hill
T04021–RB2	Applied physics Arthur Beiser		Tata McGraw-Hill
T04021–RB3	Engineering Physics R.K.Gaur and S.L.Gupta		Dhanpat Rai Publication, New Delhi
T04021–RB4	Fundamentals of Physics Resnick, Halliday & Walker		Wiley India Pvt. Ltd
T04021–RB5	Nano technology- principles and practices Dr. S K Kulkarni		Capital publishing company
T04021–RB6	Engineering Chemistry, Jain & Jain		Dhanpat Rai and Sons

T04021–RB7	Engineering Chemistry, S. S. Dara,		S. Chand Publication
T04021–RB8	Environmental Chemistry & Pollution Control, S. S. Dara,		S. Chand Publication
T04021–RB9	Polytechnic Chemistry, Vedprakash Mehta,		Jain brothers
T04021–RB10	Industrial Chemistry, B. K. Sharma,	1st 2002	Goel Publication
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04025 -CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04025-WL1			

PART II: ENGINEERING DRAWING -1

PRESUMED KNOWLEDGE AND LEARNING OBJECTIVES

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • •	After successful completion of this course, student should be able to • Draw and interpret different engineering curves, the given mechanisms and locus of points, orthographic and Isometric projections of different objects • Use computer aided drafting packages available in Engineering field for drawing

DETAIL SYLLABUS OF REQUIRED THEORY

UN	Detail Syllabus of the Unit	CP Block
01	**Introduction to Engineering Drawing**: Introduction, Drawing Instruments and their Uses, Drawing Sheet Layout, Types of Lines and their Applications, Conventions for Material Representation, Lettering, Dimensioning, Geometrical constructions, Scales	CP 01
02	**Computer Aided Drafting**: Introduction, Advantages of CAD, Hardware and other Devices, Basic Shapes and Objects, Understanding Co-ordinate System, About AutoCAD Package, Starting with AutoCAD, Various Command in AutoCAD and its Usage	
03	**Engineering Curves and Loci of Points:** Introduction, Classification of Curves, Conics, Mathematical Analysis of Conics, Ellipse, Parabola, Hyperbola, Helix, Involute, Cycloidal Family of Curves, Archemedian Spiral, Loci of Points-Loci of Points With Given Conditions and Examples Related to Simple Mechanisms	
04	**Orthographic Projections:** Introduction, Principle of Projection, Methods of Projection, Orthographic Projection, Principal Planes of Projection and Principal Views, System of Orthographic Projection, Analysis of Reference Line in Principal Views, Symbols for Methods of Projection, Analysis of Points, Lines and Planes in Principal Views, Procedure of Preparing Orthographic Views by using First Angle Projection Method, Precedence of Lines, Method of Drawing Hidden Lines, Method of Drawing Axis Lines, Orthographic Views of Elementary Objects, Identification of Surfaces, Fillets and Rounds, Dimensioning technique as per SP-46	CP 02
05	**Isometric projection:** Introduction, Types of Pictorial Projections, Types of Axonometric Projections, Isometric Projection of a Cube, Key Terms, Isometric View or Drawing and Isometric Projection, Construction of Isometric Point, Construction of Isometric Planes, Construction of Isometric Solid, Construction of Isometric Solid having Irregular Curve	
06	**Projections of Points and Lines:** Introduction, Location of a Points (Various Positions), Conventional Representation, Projections of Points on Two Principal Planes, Projections of Points on Three Principal Planes, Auxiliary Planes, Projections of Points on Auxiliary Planes, Definition of a Straight Line, Traces of Lines, Location of a Line, Projections of Line, Projections of Line Parallel to Two Principal Planes and Perpendicular to the Third, Projections of Line Parallel to One Reference Planes and Inclined to the Other Two	
07	**Projections of Planes:** Introduction, Various Types of Planes, Traces of a Plane, Various Positions of planes, Surface of Planes Parallel to One Principal Plane and Perpendicular to the Other Two, Surface of Planes Perpendicular to One Principal Plane and Inclined to the Other Two	

DETAIL PRACTICAL ACTIVITIES

Note: Work Book shall consist of a record in the form of a journal consisting of the list of activities, printouts and necessary documentation for the following exercises. Students are expected to perform all activities and get workbook certified from the Practical Lab Instructor

UN	Name of the Practical Activity	CP Block	Questions
01	**Introduction to graphics** - (1 Sheet) Draw the following using AutoCAD i) Rectangle with given dimensions ii) Circle with given dimensions and hatch iii) Pentagon with line command iv) Hexagon with given dimensions v) Draw one figure containing circle tangent, arc and dimensioning	CP 01	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
02	**Engineering curves & Loci of points**- (1 Sheet) i) Three different curves are to be draw using any one method. ii) Draw locus of point on any one mechanism		

03	**Orthographic projections** - (Total 2 Sheets) Two objects by first angle projection method - (1 Sheet) Redraw the same sheet using AutoCAD - (1 Sheet)	**CP 02**	Students have to submit 'Activity Report in Work-Book Format' in CA **and** Perform 'Practical Activity' and face Viva for end exam on these units.
04	**Isometric projection** - (Total 2 sheets) Two objects one by true scale and another by isometric scale. (simple objects) - (1 sheet) Redraw the same sheet using AutoCAD - (1 sheet)		
05	**Projections of line and planes. -** (1 Sheet) Two problems on Projection of Lines and two problems on Projection of Planes		

LEARNING RESOURCE DETAILS

Important Note- End exam shall be based on only following types of specified learning resource:

1. Online Audio-Video (AV) Synchronized SCORM Lectures **along with** Self-Test with **each** lecture **and / or**
2. Text-Books

University **does not supply** any learning resource. **Each** student is required to purchase following **at an additional separate cost**:

1. Subscription to 'Online AV Synchronized SCORM Lectures' for a semester **and**
2. Text-Books

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
T04025-OL1	Details will be updated as and when available from the publishers.		
02. Text-Books: Core learning resource for end Exam!			
T04025-TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
T04025 -RB1	Engineering Drawing N. D. Bhatt		Charotar Publishing House
T04025 –RB2	Engineering Drawing and Graphics +AutoCAD K. Venugopal		New Age Publication
T04025 –RB3	Engineering Drawing R. K. Dhawan		S. Chand Co.
T04025 –RB4	Engineering Graphics K. R. Mohan		Dhanpat Rai and Publication Co
T04025 –RB5	Engineering Drawing N. D. Bhatt		Charotar Publishing House
T04025 –RB6	IS Code SP – 46. Engineering Drawing Practice for schools and colleges		
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
T04025 -CD1	Instructional / Learning CD developed by ARTADDICT		
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
T04025-WL1			

END OF DOCUMENT