

**CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA**

**TEACHING AND EVALUATION SCHEME FOR SECOND SEMESTER DIPLOMA IN ENGINEERING COURSES**

Sr. No.	Subject Code	SUBJECT	PERIODS			EVALUATION SCHEME					
			L	T	P	SESSIONAL EXAM			END SEM EXAM	PRACTICAL EXAM	TERM WORK
						TA	CT	TOTAL			
<b>THEORY</b>											
1.	DCMA2101	ENGINEERING MATHEMATICS - II	5	-	-	10	20	30	70	-	-
2.	DCHU2102	COMUNICATIVE ENGLISH-II	2	-	-	10	20	30	70	-	-
3.	DCCY2103	ENGINEERING CHEMISTRY	4			10	20	30	70		
4.	DCEE2104	BASIC ELECTRONICS ENGINEERING	4	-	-	10	20	30	70		
5..	DCEM2105	ENGINEERING MECHANICS	4	-	-	10	20	30	70	-	-
<b>TOTAL</b>			<b>19</b>	<b>-</b>	<b>-</b>	<b>50</b>	<b>100</b>	<b>150</b>	<b>350</b>	<b>-</b>	<b>-</b>
<b>PRACTICAL / TERM WORK</b>											
6.	DCCY2202	ENGINEERING CHEMISTRY PRACTICAL	-	-	4	-	-	-	-	25	25
7.	DCEE2203	BASIC ELECTRONICS ENGINEERING PRACTICAL	-	-	4	-	-	-	-	-	25
8.	DCEM2204	ENGINEERING MECHANICS PRACTICAL	-	-	4	-	-	-	-	-	25
9.	DCWP2205	WORKSHOP PRACTICE	-	-	6	-	-	-	-	100	25
10.	DCHU2201	COMMUNICATIVE ENGLISH-II PRACTICAL	-	-	2	-	-	-	-	-	25
11.	DCAC2206	AUTOCAD 3D			2					75	25
<b>TOTAL</b>			<b>-</b>	<b>-</b>	<b>22</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>200</b>	<b>150</b>
<b>GRAND TOTAL</b>			<b>19</b>	<b>-</b>	<b>22</b>	<b>50</b>	<b>100</b>	<b>150</b>	<b>350</b>	<b>200</b>	<b>150</b>
<b>Abbreviations: L-Lecturer, T-Tutorial, P-Practical, TA-Teachers Assessment, CT-Class Test</b>											
<b>Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50%</b>											

# DCMA2101 ENGINEERING MATHEMATICS - II

Semester & Branch: Second sem Diploma in Engg.  
Theory: 5 Periods per Week  
Total Periods: 75 Periods per Semester  
Examination: 3 Hours

Teachers Assessment : 10 Marks  
Class Test : 20 Marks  
End Semester Exam : 70 Marks  
TOTAL MARKS : 100 Marks

## Objective:

Principle and applications in Engineering are firmly ground on abstract mathematical structures. Students passing from secondary level need familiarization with such structure with a view to develop their knowledge, skill and perceptions about the applied science. Calculus is the most important mathematical tool in forming Engineering application into mathematical models. Wide application of calculus makes it imperative to develop methods of solving differential equations. The knowledge of limit, derivative and anti derivative needs to be exhaustively practiced. To help a systematic growth of skill in solving equation by calculus method will be the endeavor of this course content. Understanding the concept of co-ordinate system in 3D in case of lines, planes and sphere and it's use to solve Engineering problems. After completion of the course the student will be equipped with basic knowledge to form equations and solve them competently.

## Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Limits and Continuity	10
2	Derivatives	15
3	Partial Differentiation	06
4	Integral Calculus (Integration)	25
5	Differential Equation	07
6	Analytical Geometry in 3 Dimensions	08
7	Sphere	04
	<b>TOTAL</b>	<b>75</b>

## 1. LIMITS AND CONTINUITY

- 1.1 Define Variables, constants, function of real variables, domain and range
- 1.2 Define the following functions:  
Absolute Value function ( $|x|$ ), Greatest Integer function  $[x]$ , Trigonometric function, Inverse Circular function, Exponential function ( $e^x$ ), Logarithmic function ( $\log x$ ).
- 1.3 Explain Limit of a function, R.H. Limit, L.H. Limit & existence of Limits, Methods of evaluating Limit (Finite & Infinite Limits)
- 1.4 State Fundamental Theorem on Limits.
  - 1.4.1 Prove the following Limits:
    - (a) 
$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}$$
    - (b) 
$$\lim_{x \rightarrow a} \frac{a^x - 1}{x - a} = \log_e a$$
    - (c) 
$$\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$$

$$(d) \lim_{x \rightarrow 0} (1+x)^{1/x} = e$$

$$(e) \lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x = e$$

$$(f) \lim_{x \rightarrow 0} \frac{\log(1+x)}{x} = 1$$

$$(g) \lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$(h) \lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$$

1.5 Define continuity of functions at a point.

1.6 Problems on above (1.1 - 1.5)

## 2. DERIVATIVES

2.1 Define derivatives of functions at a given point ( $x=a$ )

2.2 Differentials  $dx$ ,  $dy$  etc. establish geometrical and physical meaning of  $dy/dx$ . Differential Coefficient  $dy/dx$ , Differential operator ( $D=d/dx$ ). Fundamental theorem on derivative viz (addition rule, subtraction rule, product rule and quotient rule).

2.3 Standard Derivative of functions such as  $x^n$ ,  $a^x$ ,  $\log x$ ,  $e^x$ ,  $\log_a x$ ,  $\sin x$ ,  $\cos x$ ,  $\tan x$ ,  $\sin^{-1}x$ ,  $\cos^{-1}x$ ,  $\tan^{-1}x$  from first principle Methods.

2.4 Perform derivative of composite function

2.5 Perform logarithmic differentiation, Differentiation of parametric function, Differentiation of Implicit Function, Differentiation of a function with respect to another function.

2.6 Define Successive Differentiation (up to 2<sup>nd</sup> Order)

2.7 Define Maxima, Minima & points of inflexion and necessary condition for Maxima & Minima (up to 2<sup>nd</sup> Order only)

2.8 Define Local Extremum, absolute Maxima / Minima

2.9 Problems on above (2.1 - 2.8)

## 3. PARTIAL DIFFERENTIATION

3.1 Explain functions of several variables.

3.2 State partial derivatives up to three independent variables

3.3 State homogeneous function of two variables and Euler's Theorem on homogenous function for two variables.

3.4 Problems on above (3.1 - 3.3)

## 4. INTEGRAL CALCULUS (INTEGRATION)

4.1 Define Integration as inverse process of differentiation.

4.2 Define indefinite and definite Integral

4.3 State Integrals of standard functions

4.4 Explain Methods of Integration (i) Integration by Decomposition of Integrand, (ii) Integration by Substitution, (iii) Integration by parts

4.5 Establish formula for the following:

$$(a) \int \frac{dx}{x^2 + a^2}, \int \frac{dx}{x^2 - a^2}, \int \frac{dx}{a^2 - x^2}, \int \frac{dx}{\sqrt{x^2 + a^2}}, \int \frac{dx}{\sqrt{x^2 - a^2}}$$

$$(b) \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{x\sqrt{x^2 - a^2}}, \int \sqrt{a^2 - x^2} dx, \int \sqrt{a^2 + x^2} dx, \int \sqrt{x^2 - a^2} dx$$

- 4.6 Explain Methods of Integration by partial fraction.
- 4.7 Definite Integrals, properties of Definite Integrals.
- 4.8 Find area bounded by the curve  $y=f(x)$ ,  $x=a$ ,  $x=b$  and  $x$ -axis and the area bounded by the curve  $x=f(y)$ ,  $y=c$ ,  $y=d$  and  $y$ -axis.
- 4.9 Problems on above (4.1 - 4.8)

## 5. DIFFERENTIAL EQUATION

- 5.1 Define differential equation, order and degree of a differential equation
- 5.2 Formation of first order first degree differential equation.
- 5.3 Solution of first order and first degree differential equation by the following methods (i) separation of variables (ii) Linear (iii) Exact
- 5.4 Problems on above (5.1 - 5.3)

## 6. ANALYTICAL GEOMETRY IN THREE DIMENSIONS

- 6.1 Describe co-ordinates of a point in rectangular co-ordinate system
- 6.2 Derive distance formula, division formula
- 6.3 Explain Dcs & Drs of a line, the formula for angle between two lines with given Drs, conditions of perpendicularity and parallelism.
- 6.4 State equation of a plane
- 6.5 Find equation of a plane in different forms (i) General form  $Ax+By+Cz+D=0$ , where A,B,C are Drs of the normal to the plane, (ii) Intercept form  $(X/a+Y/b+Z/c=1)$ , (iii) Normal form.
- 6.6 Find angle between two planes
- 6.7 Find perpendicular distance from a point to a plane
- 6.8 Problems on above (6.1 - 6.7)

## 7. SPHERE

- 7.1 Define sphere, equation of a sphere
- 7.2 Find the equation of a sphere whose centre and radius is given
- 7.3 Derive general equation of a sphere equation of a sphere on a given diameter and equation of a sphere passing through four non-coplanar points
- 7.4 Problems on above (7.1 - 7.3)

### Books Recommended

1. Elements of Mathematics – Vol -1 & II (Odisha State Bureau of Text Book Preparation & Production)

### Reference Books

2. A Text book of Engineering Mathematics by Dr. Chittaranjan Mallick & S.Mallick (Kalyani Publisher)

# DCHU2102 COMMUNICATIVE ENGLISH - II

Semester & Branch: Second sem Diploma in Engg.  
Theory: 2 Periods per Week  
Total Periods: 30 Periods per Semester  
Examination: 3 Hours

Teachers Assessment : 10 Marks  
Class Test : 20 Marks  
End Semester Exam : 70 Marks  
TOTAL MARKS : 100 Marks

## Aim:

To develop confidence in Communication  
To develop vocabulary  
To develop mannerism in expression

## Objective:

The students will be able to:

Understand and use the basic concepts of communication and principles of effective communication in an organized set up and social context.

Give a positive feedback in various situations, to use appropriate body language and to avoid barrier for effective communication.

Write the various types of letter, reports and office drafting with appropriate format.

## Pre-Requisite:

English grammar should be perfect

The idea (thinking process) to express the views must be fast.

Perfect expression through body language.

## Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Introduction to Communication	03
2	Types of Communication	04
3	Principles of Effective Communication	04
4	Nonverbal Communication	05
5	Formal Writing Skills	14
	<b>TOTAL</b>	<b>30</b>

## 1. INTRODUCTION TO COMMUNICATION

1.1 Meaning, Definition and concept of communication

1.2 Communication model

1.3 Process of communication and factors responsible for it: Sender, Message, Channel, Receiver / Audience, Feedback, Noise, Context.

## 2. TYPES OF COMMUNICATION

2.1. Formal Communication

2.1.1 Upward Communication

2.1.2 Down-ward Communication

2.1.3 Parallel Communication

2.2 Informal Communication: Grape Vine Communication

2.3 Verbal Communication: Definition and meaning

2.4 Non- Verbal Communication: Definition and meaning

### **3. PRINCIPLE OF EFFECTIVE COMMUNICATION**

3.1 What is effective communication?

3.2 Communication Barriers

3.2.1 What is communication barrier?

3.2.2 Types of communication barrier

3.2.3 Overcoming Barriers to communication

3.3 Developing effective message:

Thinking about audience and purpose, structuring the message (effective coding), selecting proper channel, minimizing barriers and facilitating feed back

### **4. NON VERBAL COMMUNICATION**

4.1 Meaning of nonverbal - graphic communication

4.2 Non-verbal codes: Meaning and general idea of Kinesics, Proxemics and Signs and Symbols

### **5. FORMAL WRITING SKILLS**

5.1 Job application and C.V.

5.2 Business correspondence:

Enquiry, Order letter, Complaint.

5.3 Letter to the Principal, Librarian, Head of the Deptt, and Hostel Superintendent

5.4 Situation and person description

5.5 Report writing:

Reporting an event / news, progress and fall in production

### **ASSIGNMENT (10 MARKS)**

**1. Making a Communication Model** on a situation given by the teacher.

**2. Narration / Description**

Any object seen through the window of the class room

Any person that interests the student

Any event that the student has come across with while coming to the institution

**3. Comparison** between time tables of two students belonging to two different branches.

**4. Identification** of sentences with reference to their type of writing and subject

Interpretation [i.e. scientific, philosophical, legal, colloquial, business etc]

**5. Report writing** (in about 30-40 sentence)

Writing a report on any event/news

An investigation report

Reporting on a seminar or a practical class

### **Books Recommended**

1. Communicative English by Abhishek and Arora (Kalyani Publishers)

2. Communication Skills by Sanjay Kumar and Puspallata (Oxford University Press)

# DCCY2103 ENGINEERING CHEMISTRY

Semester & Branch: First / Second sem Diploma in Engg.

Theory: 4 Periods per Week

Total Periods: 60 Periods per Semester

Examination: 3 Hours

Teachers Assessment : 10 Marks

Class Test : 20 Marks

End Semester Exam : 70 Marks

TOTAL MARKS : 100 Marks

## Objective:

Engineering Chemistry is concerned with the changes of matters with its environment and an ever growing subject. So, the aim of teaching Engineering Chemistry in Diploma Courses is to acquaint the students with the basic Chemistry of different materials used in industry and to equip the students with the basic principles of chemical changes taking place in different aspects connected to engineering fields. They also develop the right attitude to cope up with the continuous flow of new technology.

## Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Physical Chemistry	20
2	Inorganic Chemistry	08
3	Organic Chemistry	08
4	Industrial Chemistry	12
5	Environmental Chemistry	12
	<b>TOTAL</b>	<b>60</b>

## 1. PHYSICAL CHEMISTRY

- 1.1 General concept of Atomic structure, Rutherford's Atomic model, Bohr's Atomic model, Bohr-Bury scheme, Electronic configuration, Aufbau's principle, Atomic weight, Molecular weight, Equivalent weight
- 1.2 Concept of Chemical Bond such as Electrovalent, Covalent and Coordinate bond with examples
- 1.3 Concept of Arrhenius, Lowry Bronsted and Lewis theory for acid and base with examples.

Definition of Salt, Types of salt, Neutralization of Acid and Base, Determination of equivalent weight of Acid, Base and Salt.

Definition of Normal, Molar, Molal solution and Normality, Molarity and Molality (Simple problems)

pH of solution, Importance of pH in industry

- 1.4 Electrochemistry: Definition of Electrolyte, Electrolysis, Electrolytic cell, Faraday's 1<sup>st</sup> and 2<sup>nd</sup> law of Electrolysis, Industrial application of Electrolysis- Electroplating ( Chromium and Zinc), Electrorefining.
- 1.5 Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, Waterline Corrosion, Protection from Corrosion by (i) Alloying and (ii) Galvanization

## **2. INORGANIC CHEMISTRY**

- 2.1 Metallurgy: Definition of Mineral, ore, flux, slag, General methods of extraction of metal, Dressing, concentration, Calcinations, Roasting, Smelting, Refining of ore (a brief idea)
- 2.2 Alloys: Definition of alloy, Composition and uses of Brass, Bronze, Alnico, Duralumin

## **3. ORGANIC CHEMISTRY**

- 3.1 Hydrocarbons: Saturated and Unsaturated Hydrocarbons, Aliphatic and Aromatic Hydrocarbons.
- 3.2 IUPAC system of nomenclature of Alkane, Alkene, Alkyne, Alkyl halide and Alcohol

## **4. INDUSTRIAL CHEMISTRY**

- 4.1 Water: Sources of water, Soft water, Hard water, Types of Hardness (temporary and permanent), Removal of hardness by lime soda method, Ion exchange method.
- 4.2 Lubricants: Definition of lubricant, Types and uses of lubricants, Purpose of lubrication
- 4.3 Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.

Solid: Coal-Lignite, Bituminous and Anthracite

Liquid: Diesel, Petrol, Low Sulphur Heavy Stock (LSHS)

Gaseous: Composition and uses of Producer gas and Water gas, Elementary idea about LPG and CNG

- 4.4 Polymer: Definition of Monomer, Polymer, Homopolymer, Co-polymer and Degree of polymerization

Difference between Thermosetting and Thermoplastic, Composition and uses of Poly-Vinyl Chloride and Bakelite

## **5. ENVIRONMENTAL CHEMISTRY**

- 5.1 Explain structure of atmosphere (i) Troposphere (ii) Stratosphere
- 5.2 Definition with example- Pollutant, Contaminant, Receptor, Pathway of pollutant and receptor, Types of pollutant
- 5.3 Definition of water pollution, Different sources of water pollution, Control of water pollution
- 5.4 Definition of air pollution, major air pollutants, Control of air pollution
- 5.5 Brief idea on Greenhouse Effect, Depletion of Ozone Layer, Acid Rain

### **Books Recommended**

1. Text Book of Intermediate Chemistry Part-1 and Part-2 by Nanda, Das, Sharma, Kalyani Publishers
2. Engg. Chemistry by B.K. Sharma, Krishna Prakashan Media Pvt. Ltd
3. Environmental Chemistry by Dr. Sunakar Panda

### **Reference Books**

1. Engineering Chemistry by Y.R. Sharma and P. Mitra, Kalyani Publishers
2. Engineering Chemistry- Jain & Jain, Dhanpat Roy and Sons
3. Environmental Chemistry by A.K. Dey



# DCEE2104 B A S I C E L E C T R O N I C S E N G I N E E R I N G

Semester & Branch: First / Second sem Diploma in Engg.  
Theory: 4 Periods per Week  
Total Periods: 60 Periods per Semester  
Examination: 3 Hours

Teachers Assessment : 10 Marks  
Class Test : 20 Marks  
End Semester Exam : 70 Marks  
TOTAL MARKS : 100 Marks

## Aim:

Electronics plays major in our day to day life. In each and every field, electronics systems are used. Basic electronics is one of the subjects which is the base of all advance electronics .It starts with PN junction which makes the student to follow the functioning of all semiconductor based electronics. This is a core group subject and it develops cognitive and psychomotor skills. Basic electronics is one of the subjects which is the base of all advance electronics. The student will also acquire brief knowledge about communication system as well as transducers and measuring instruments.

## Objective:

### Student will be able to:

- 1 Know what is Electronics & its application.
- 2 Describe the formation of PN junction.
- 3 Draw the characteristics of basic components like diode, transistor etc.
- 4 Draw and describe the basic circuits of rectifier, filter, regulator and amplifiers.
- 5 Know voltage & power amplifiers.
- 6 Test diode and transistors.
- 7 Read the data sheets of diode and transistors.

## Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Electronic Devices	05
2	Semiconductor Diode	09
3	Rectifiers & Filters	08
4	Transistors	12
5	Regulated Power Supply	08
6	Small Signal Amplifiers (CE)	07
7	Audio & Video Power Amplifier & Oscillator	04
8	Transducers & Measuring Instruments	04
9	Communication Systems	03
	<b>TOTAL</b>	<b>60</b>

## 1. ELECTRONIC DEVICES

- 1.1 Define Electronics & its application.
- 1.2 Define Electronic Emission & different types of Emission.
- 1.3 Classification of Solid according to electrical conductivity (Conductor, Semiconductor & Insulator) with respect to energy band diagram only.
- 1.4 Discuss Intrinsic & Extrinsic Semiconductor.
- 1.5 Explain the difference between vacuum tube & semiconductor.
- 1.6 State basic concept of integrated circuits (I.C) & its use.

## 2. SEMICONDUCTOR DIODE

- 2.1 Define Rectifier & state its use.

### 2.1.1 Rectifying diode

Review of P-type and N-type semiconductor, PN junction Diode, circuit diagram & its symbol, PN junction Barrier voltage, Depletion region, Junction Capacitance.

### 2.1.2 Forward & reverse bias & V-I Characteristics of PN junction diode.

### 2.1.3 Specifications:-(Definition)

Forward voltage drop, Reversed saturation current, maximum forward current, power dissipation of diodes of different power ratings

## 2.2 Zener Diode

### 2.2.1 Construction (reference to doping level)

### 2.2.2 Symbol ,circuit diagram for characteristics (forward & reverse bias)

### 2.2.3 Avalanche & Zener breakdown.

## 2.3. Special Diodes

### 2.3.1 Tunnel diode

## 2.4. Optical Diodes

### 2.3.4 LED, photo diode & IR LED

(Symbol, working principle & application of each)

## 3. RECTIFIERS & FILTERS

### 3.1. Rectifier - Definition & Need of rectifier

#### 3.1.1. Types of Rectifier – Half wave rectifier, Full wave rectifier (Bridge & Center tapped)

3.1.2. Circuit operation: Input/output waveforms for voltage & current, Average (dc) value of current & voltage (no derivation), Ripple, ripple factor, ripple frequency, PIV of diode used, transformer utilization factor, efficiency of rectifier. (Definition)

#### 3.1.3. Comparisons of three types of rectifier

### 3.2. Filters - Need of filters & Types of filter

[i] Shunt Capacitor [ii] Series Inductor [iii] LC filter [iv]  $\pi$  filter

3.2.1. Circuit operation, ripple factor, ripple frequency, Input/output waveforms, limitations & advantages. (Definition & no derivation)

## 4. TRANSISTORS

### 4.1 Bipolar Junction Transistor (BJT)

Basic concept, Define Transistor

#### 4.1.1 Types of transistors, symbols, Transistor operation

Conventional current flow, relation between different currents in transistor( $I_e$  ,  $I_c$  &  $I_b$ )

#### 4.1.2 Transistor amplifying action

Transistor configurations:- CB, CE, & CC-Circuit diagram to find the characteristics, Input/output characteristics. (No derivation)

4.1.3 Transistor parameters –Input resistance, output resistance,  $\alpha$ ,  $\beta$  & relation between them.

#### 4.1.4 Transistor specification:

$V_{CE\text{ Sat}}$ ,  $I_{C\text{ Max}}$ ,  $V_{CE0}$ ,  $I_{CE0}$ ,  $\alpha$ ,  $\beta$ ,  $V_{CE\text{ Breakdown}}$ , Power dissipation (Definition -I using data sheets)

4.1.5 Construction, working principle, characteristics of photo Transistor (Introduction to Opto-coupler only)

### 4.2 Unipolar Transistor (JFET)

Symbol, Construction, working principle & applications

### 4.3 Biasing of BJT

- 4.3.1 Introduction, need of biasing, Types of biasing circuits (only name), circuit operation of Base biased circuit (only), concept of dc load line, Saturation, Cut off, selection of operating point (Q point), need of stabilization of Q point.

## 5. REGULATED POWER SUPPLY

### 5.1 What is a Regulator?

- 5.1.1 Need of regulators, voltage regulation factor
- 5.1.2 Concept of load regulation & line regulation
- 5.1.3 Basic Zener diode as a voltage regulator

### 5.2 Linear Regulators

- 5.2.1 Basics block diagram of dc Regulated power supply

### 5.3 IC's Voltage Regulator – 78xx, 79xx (as fixed ) & LM 317 (as variable )

## 6. SMALL SIGNAL AMPLIFIERS (CE)

### 6.1 Concept of Amplification

- 6.1.1 Small signal amplifier using BJT power gain, voltage gain.
- 6.1.2 AC Load Line.
- 6.1.3 Function of Input & Output coupling capacitors
- 6.1.4 Function of emitter bypass capacitor.

### 6.2 AC equivalent circuit of transistor CE amplifier (Circuit diagram only)

### 6.3 Single stage CE amplifier with voltage divider bias and its explanation.

### 6.4 Bel, Decibel & Bandwidth (Definition).

### 6.5 Define Cascade Amplifiers (Multistage Amplifier)

- 6.5.1 Need of Multistage Amplifiers, Gain of amplifier.

## 7. AUDIO & VIDEO POWER AMPLIFIER & OSCILLATOR

### 7.1 Define voltage & power amplifier and their application.

### 7.2 Define Oscillator & its application & types (only names)

- 7.2.1 Explain essentials of transistor Oscillator.

## 8. TRANSDUCERS AND MEASURING INSTRUMENTS

### 8.1 Define Transducer.

### 8.2 Classify different type of Transducers.

### 8.3 Discuss working of Thermocouple & its application

### 8.4 Explain working of Multimeter and comparison between Analog and Digital Multimeter

### 8.5 Explain Block diagram of CRO, Measurement (Frequency & Amplitude) & its use.

## 9. COMMUNICATION SYSTEM

### 9.1 Define Modulation & its need.

### 9.2 Name different types of Modulation (AM, FM & PM)

### 9.3 Discuss Amplitude Modulation & Frequency Modulation (Signal, Carrier Wave & Modulated Wave) (No Mathematical Derivation.)

### 9.4 Define Demodulation.

### Books Recommended

1. Grob's Basic Electronics by Mitchel E. Schultz, 10<sup>th</sup> edition, Tata McGraw Hill
2. Principle of Electronics by V. K. Meheta & Rohit Mehta, S.Chand & Company Ltd
3. Electronic Device & Circuit Theory by Robert L. Boylestad & Louis Nashelsky Pearson Publication

### Reference Books

1. Electronics Devices and Circuits by David A. Bell, Oxford University Press
2. Electronic Circuits by Dr. R. S. Sidha, S Chand & Company Ltd

# DCEM2105 ENGINEERING MECHANICS

Semester & Branch: First / Second sem Diploma in Engg.  
Theory: 4 Periods per Week  
Total Periods: 60 Periods per Semester  
Examination: 3 Hours

Teachers Assessment : 10 Marks  
Class Test : 20 Marks  
End Semester Exam : 70 Marks  
TOTAL MARKS : 100 Marks

## Objective:

### On completion of the subject, the student will be able to:

1. Compute the force, moment & their application through solving of simple problems on coplanar forces.
2. Understand the concept of equilibrium of rigid bodies.
3. Know the existence of friction & its applications through solution of problems on above.
4. Locate the C.G. & find M.I. of different geometrical figures.
5. Know the application of simple lifting machines.
6. Understand the principles of dynamics.

### Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Fundamentals of Engineering Mechanics	14
2	Equilibrium	08
3	Friction	10
4	Centroid & moment of Inertia	14
5	Simple Machines	08
6	Dynamics	06
	<b>TOTAL</b>	<b>60</b>

## 1. FUNDAMENTALS OF ENGINEERING MECHANICS

### 1.1 Fundamentals.

Definitions of Mechanics, Statics, Dynamics, Rigid Bodies, Mass, Weight, Length, Time, Scalar & Vector, Fundamental units. Derived units, S.I. units.

### 1.2 Force

Definition of Force & its units, Representation of Force by vector, Characteristics of Force & effect of Force. Principles of Transmissibility & Principles of Superposition. Action & Reaction Forces & concept of Free Body Diagram.

### 1.3 Resolution of a Force.

Definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components.

### 1.4 Moment of Force.

Definition, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I. units. Classification of moments according to direction of rotation, sign convention, Law of moments, Varignon's Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple.

### 1.5 Force System.

Definition, Classification of force system according to plane & line of action.

### 1.6 Composition of Forces.

Definition, Resultant Force, Method of composition of forces, such as

1.6.1 Analytical Method such as Law of Parallelogram of forces & method of resolution.

1.6.2 Graphical Method.

Introduction, Space diagram, Vector diagram, Polygon law of forces. Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.

## **2. EQUILIBRIUM**

2.1 Definition, condition of equilibrium, Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram.

2.2 Lamia's Theorem – Statement, Application for solving various engineering problems.

## **3. FRICTION**

3.1 Definition of friction, Frictional forces, Limiting frictional force, Coefficient of Friction. Angle of Friction & Repose, Laws of Friction, Advantages & Disadvantages of Friction.

3.2 Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (up & down).

3.3 Ladder, Wedge Friction.

## **4. CENTROID & MOMENT OF INERTIA**

4.1 Centroid – Definition, Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles, centroid of composite figures.

4.2 Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems. M.I. of plane lamina & different engineering sections.

## **5. SIMPLE MACHINES**

5.1 Definition of simple machine, velocity ratio of simple and compound gear train, explain simple & compound lifting machine, define M.A, V.R. & Efficiency & State the relation between them, State Law of Machine, Reversibility of Machine, Self Locking Machine.

5.2 Study of simple machines – simple axle & wheel, single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.

## **6. DYNAMICS**

6.1 Define Kinematics & Kinetics, State Principles of Dynamics, Newton's Laws of Motion, Motion of Particle acted upon by a constant force, Equations of motion, De-Alembert's Principle.

6.2 Work, Power, Energy & its Engineering Applications, explain Kinetic & Potential energy & its application.

6.3 Define Momentum & impulse, explain conservation of energy & linear momentum, explain collision of elastic bodies, and define Coefficient of Restitution.

### **Books Recommended**

1. Engineering Mechanics – by A.R. Basu (TMH Publication Delhi)
2. Engineering Machines – Basudev Bhattacharya (Oxford University Press).
3. Text Book of Engineering Mechanics – R.S Khurmi (S. Chand).

### **Reference Books**

1. Applied Mechanics & Strength of Material – By I.B. Prasad.
2. Engineering Mechanics – By Timosheenko, Young & Rao.
3. Engineering Mechanics – Beer & Johnson (TMH Publication).

# DCHU2201 COMMUNICATIVE ENGLISH-II PRACTICAL

Semester & Branch: Second sem Diploma in Engg.

Practical: 2 Periods per Week

Total Periods: 30 Periods per Semester

Term Work : 25 Marks

TOTAL MARKS : 25 Marks

## Topic wise distribution of periods

Sl. No.	Topic	Periods
1	Personality Development	05
2	Interpersonal Skills	10
3	Presenting in G D , Seminar & Conferences	15
	<b>TOTAL</b>	<b>30</b>

### 1. PERSONALITY DEVELOPMENT

- 1.1 Physical appearance
- 1.2 Audience purpose
- 1.3 Initiation

### 2. INTERPERSONAL SKILLS

- 2.1 Appropriate use of non-verbal skills in face-to-face communication i.e viva- voice, group-interviews, GDs and seminars

### 3. PRESENTING IN GD, SEMINARS AND CONFERENCES

- 3.1 Leadership Quality
- 3.2 Time Management
- 3.3 Achieving the Target

# DCCY2202 ENGINEERING CHEMISTRY PRACTICAL

Semester & Branch: First / Second sem Diploma in Engg.

Practical: 4 Periods per Week

Total Periods: 60 Periods per Semester

Examination: 4 Hours

Practical Exam : 25 Marks

Term Work : 25 Marks

TOTAL MARKS : 50 Marks

1. Preparation and study of properties of CO<sub>2</sub> gas (Carbon Dioxide) (Gas causing Greenhouse Effect)
2. Preparation and study of properties of O<sub>2</sub> gas (Oxygen) (Life saving Gas)
3. Crystallization of Copper Sulphate from Copper Carbonate
4. Identification of unknown salt (One acid radical, One basic radical)

## A) Acid Radicals

- i. Carbonate
- ii. Sulphide
- iii. Chloride
- iv. Nitrate
- v. Sulphate

## B) Basic Radicals

- i. Ammonium
- ii. Copper
- iii. Zinc
- iv. Magnesium
- v. Aluminium
- vi. Calcium
- vii. Sodium
- viii. Potassium

## 5. Simple Acid-Base Titration

- i. Acidimetry
- ii. Alkalimetry

## Books Recommended

1. Practical Intermediate Chemistry by Dr. Bichitrananda Nanda
2. Elementary Experimental Chemistry by Y.R. Sharma and A.K. Das Kalyani Publishers

# DCEE2203 BASIC ELECTRONICS ENGINEERING PRACTICAL

Semester & Branch: First / Second sem Diploma in Engg.  
Practical: 4 Periods per Week  
Total Periods: 60 Periods per Semester

Term Work : 25 Marks  
TOTAL MARKS: 25 Marks

## Skills to be developed:

1. Draw the symbols of components
2. Identification & selection of components.
3. Interpretation of circuits.
4. Understand working of Regulated dc power supply.
5. Measure Current, voltage using Instrument

## List of Practicals

1. Identify different types of tools and essential equipment in Electronics Laboratory (Sl no 1 to 16 of Tool list)
2. Draw the symbols of different Electronic Components
3. Study of Analog & Digital Multimeter (Front Panel) & Measurement of voltage, current and resistance using Multimeter
4. Identify & test the different Active & Passive components, Switches, Cables, Connector & perform Soldering practice & its testing.
5. Study of Front Panel Control of Oscilloscope (Analog & Storage) & measurement of Frequency & Amplitude of wave forms
6. To plot Forward & Reverse basic characteristics of diode.
7. To plot forward & reverse basic characteristics of Zener diode.
8. To study the Rectifier a) Half wave and b) Full wave (draw I/p & o/p wave forms.)
9. To study the Filter circuits. a) Capacitors Filter b)  $\pi$  filter & draw its wave forms.
10. To Plot Input & Output characteristics of transistor in CE mode.
11. To study the Zener Diode as Regulator & calculate load regulation.
12. To study Single stage common emitter amplifier.
13. Project Work - Construct of IC regulated Power Supply using 78xx, 79xx, LM317 as fixed / variable which include rectifier circuit – **(Any one)**



# **BEP103 ENGINEERING MECHANICS PRACTICAL**

## **DCEM2204 ENGINEERING MECHANICS PRACTICAL**

Semester & Branch: First / Second sem Diploma in Engg.  
Practical: 4 Periods per Week  
Total Periods: 60 Periods per Semester

Term Work : 25 Marks  
TOTAL MARKS : 25 Marks

### **List of Practicals**

A student has to perform any five experiments out of the following:

1. Verify Law of Polygon of Forces.
2. Verify Law of Moments.
3. Verify Lami's Theorem.
4. To determine Angle of Repose.
5. To find M.A., V.R & Efficiency of Simple Wheel & Axle.
6. To find M.A, V.R. & Efficiency of Single purchase Crab.
7. To find M.A, V.R & Efficiency of Double Purchase Crab.
8. To find M.A, V.R & Efficiency of Worm & Worm Wheel.
9. To find M.A, V.R & Efficiency of Simple Screw Jack.
10. Graphical solution for concurrent force System using Drawing sheets.

# DCWP2205 WORKSHOP PRACTICE

Semester & Branch: First / Second sem Diploma in Engg.  
Practical: 6 Periods per Week  
Total Periods: 90 Periods per Semester  
Examination: 4 Hours

Practical Exam : 100 Marks  
Term Work : 25 Marks  
TOTAL MARKS : 125 Marks

## Objective:

1. To demonstrate safely practice in various shops of the workshop.
2. To select suitable tools & equipment in the following shops.
  - (a) Fitting.
  - (b) Sheet Metal.
  - (c) Welding (Gas & Electrical).
  - (d) Turning.
3. To select suitable materials for different process in the above shops.
4. To demonstrate the different processes adopted in the above shops.
5. To finish the jobs within stipulated time and with accuracy as per specifications.

## Topic Wise distribution of periods

Sl. No.	Topics	Periods
1	Fitting Shop	24
2	Sheet Metal	18
3	Welding Shop	24
4	Turning Shop	21
5	Exposure to CNC Milling / Lathe Machine	03
	<b>TOTAL</b>	<b>90</b>

### 1. FITTING SHOP

- 1.1 Demonstrate safety practices in the fitting shop.
- 1.2 Select suitable holding & clamping devices for fitting jobs.
- 1.3 Select suitable tools like- files, vice, chisels, punch, scriber, hammers, surface plate, V-block, try square, caliper etc.
- 1.4 Demonstrate the following operations:  
Sawing, Chipping, Fitting, Craping, Grinding, Marking, Reaming, Tapping, Drilling & Angular cutting.
- 1.5 Introduction of chipping, demonstration on chipping and its applications.
- 1.6 Description, demonstration and practice of simple operation of hack saw straight and angular cutting.
- 1.7 Introduction and use of measuring tools used in fitting shop like steel rule, measuring tape, outside micrometer, vernier caliper and vernier height gauge.
- 1.8 Description and Demonstration and practice of thread cutting using taps and dies.  
Job: Cutting & fitting practice on a square of 50mm X 50mm X 8mm MS Flat.  
Job: Angular cutting practice of 45 degree (on the above job).  
Job: Preparation of stud (to cut external threads) with the help of dies (mm or BSW).  
Job: H-fitting in the mild steel (ms) square.  
Job: Prepare one job on male female fitting.

## **2. SHEET METAL**

- 2.1 Demonstrate safety practices in sheet metal shop.
- 2.2 Prepare surface development for the jobs according to the drawing.
- 2.3 Cut M.S and G.P. sheets according to the surface development / drawing using standard sheet metal cutting tools.
- 2.4 Select hand tools for sheet metal work.
- 2.5 Demonstrate the process of metal clamp joining and reveted joining of sheet metals.  
Job: Making of sheet metal joints.  
Job: Prepare a sheet metal tray or a funnel.  
Job: Prepare a sheet metal job involving rolling, shearing, creasing, bending & cornering.  
Job: Prepare a lap riveting joint.

## **3. WELDING SHOP**

- 3.1 Introduction.
- 3.2 Safety precautions in welding, safety equipments & its application in welding shop.
- 3.3 Introduction to welding, type of welding, common materials that can be welded, introduction to gas welding equipment, types of flame, adjustment of flame, applications of gas welding, Welding tools & safety precautions.
- 3.4 Introduction to electric arc welding (AC & DC), practice in setting current & voltage for striking proper arc, precautions while using electric arc welding. Applications of arc welding. Introduction to polarity & their use.
- 3.5 Demonstrate & use of the different tools used in the welding shop with sketches, Hand shield, helmet, clipping hammer, gloves, welding lead, connectors, aprons, goggles, etc.
- 3.6 Demonstrate of welding defects & various types of joints & end preparation.  
Job: Preparation of lap joint by arc welding rod.  
Job: Preparation of Tee joint by arc welding.  
Job: Preparation of single V or double V butt joint by electric arc welding.  
Job: Brazing practice. Use of Spelt or (on MS sheet pieces).  
Job: Gas welding practice on worn-out & broken parts.

## **4. TURNING SHOP**

- 4.1 Introduction.
- 4.2 Safety precaution & safety equipments.
- 4.3 Various marking, measuring, cutting & holding tools.
- 4.4 Demonstration of different parts of a lathe, demonstration on centering & turning operation in a group of 06 students.  
Job: plain turning, taper turning & grooving practices on round bar.

## **5. EXPOSURE TO C.N.C MILLING / LATHE MACHINE**

### **Reference Books**

1. Workshop Technology by S.K.Hajara Choudhary, Media Promoters Publishers, New Delhi.
2. Workshop Technology by B.S. Raghubanshi, Dhanpat Rai and Sons, New Delhi.
3. Workshop Technology by H.S. Bawa – TMH.
4. Workshop Familiarization by E Wilkinson.
5. Sheet metal shop practice by Bruce & Meyer.
6. Workshop Technology by R.S. Khurmi & J.K. Gupta, S.Chand.

### **Notes**

1. Work, Progress book should be maintained continuously.
2. The roll numbers of the students must be punched on each job.
3. The turning shop job should be done by students' maximum 06 students in a group.

<b>AUTOCAD 3D</b>					
<b>DCAC2206</b>					
<b>SEMESTER</b>	:	<b>2ND</b>	<b>TERM WORK</b>	:	25
<b>BRANCH</b>	:	<b>Common for all(ME,CE,EL,IT)</b>	<b>PRACTICAL</b>	:	75
<b>PERIODS</b>	:	<b>2</b>			
<b>EXAMINATION</b>	:	<b>3HRS</b>	<b>TOTAL MARKS</b>	:	100

2.0 3D drafting.

- 2.1 Create various drawing views of the 3-D parts.
- 2.2 Extrude the face / plane to get 3-D views.