

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, 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			
		THEORY									
1.	BST101 OR BST102	ENGINEERING PHYSICS OR ENGINEERING CHEMISTRY	4	-	-	10	20	30	70	-	-
2.	BST201	ENGINEERING MATHEMATICS - II	5	-	-	10	20	30	70	-	-
3.	BET101 OR BET102	BASIC ELECTRICAL ENGINEERING OR BASIC ELECTRONICS ENGINEERING	4	-	-	10	20	30	70	-	-
4.	BET103 OR BET104	ENGINEERING MECHANICS OR COMPUTER APPLICATION	4	-	-	10	20	30	70	-	-
5.	HMT201	COMMUNICATIVE ENGLISH-II	2	-	-	10	20	30	70	-	-
		TOTAL	19	-	-	50	100	150	350	-	-
		PRACTICAL / TERM WORK									
6.	BSP101 OR BSP102	ENGINEERING PHYSICS PRACTICAL OR ENGINEERING CHEMISTRY PRACTICAL	-	-	4	-	-	-	-	25	25
7.	BEP101 OR BEP102	BASIC ELECTRICAL ENGINEERING PRACTICAL OR BASIC ELECTRONICS ENGINEERING PRACTICAL	-	-	4	-	-	-	-	-	25
8.	BEP103 OR BEP104	ENGINEERING MECHANICS PRACTICAL OR COMPUTER APPLICATION PRACTICAL	-	-	4	-	-	-	-	-	25
9.	BEP105 OR BEP106	ENGINEERING DRAWING OR WORKSHOP PRACTICE	-	-	6	-	-	-	-	100	25
10.	HMP201	COMMUNICATIVE ENGLISH-II PRACTICAL	-	-	2	-	-	-	-	-	25
		TOTAL	-	-	20	-	-	-	-	125	125
		GRAND TOTAL	19	-	20	50	100	150	350	125	125

Abbreviations: L-Lecturer, T-Tutorial, P-Practical, TA-Teachers Assessment, CT-Class Test

Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50%

BST201 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
	TOTAL	75

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:

$$(a) \lim_{x \rightarrow 0} \frac{x^n - a^n}{x - a} = na^{n-1}$$

$$(b) \lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \log_e a$$

$$(c) \lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$$

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

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

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

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

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

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 2nd Order)

2.7 Define Maxima, Minima & points of inflexion and necessary condition for Maxima & Minima (up to 2nd 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)

HMT201 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
	TOTAL	30

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)

HMP201 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
	TOTAL	30

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