RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
OUTCOME BASED CURRICULUM

NAME OF THE PROGRAMME: AUTOMOBILE ,MECH, RAC, CHEMICAL , CEMENT, PRODUCTION, CIVIL, CTM, PRINTING and TEXTILE TECH

Name of Scheme : OCBC-2019 **COURSE CODE :6803**

COURSE TITLE : CHEMISTRY SEMESTER-II

	Course outcomes	Mapping with POs
CO103.1	Illustrate and summarize the structure and properties of matter and phenomenon involved in engineering.	PO1, PO7
CO103.2	Classify, compare and infer some essential engineering materials.	PO1,PO2, PO3
CO103.3	Describe and interpret industrial processes	PO1,PO2, PO3
CO103.4	Analyze the contents of essential raw materials utilized in industrial procedures	PO2, PO3
CO103.5	Provide the required prerequisite knowledge to understand technical subjects.	PO1,PO2, PO4

CO-PO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PEO1	PEO2
CO103.1	3	1		1	1	1	2		
CO103.2	1	3	2	3	1	2	2		
CO103.3	3	2	1	2	2	2	2		
CO103.4	2	1	2	2	2	1	2		
CO103.5	3	1	1	1	2	1	2		
CO-PO MAPPING FOR PRACTICALS									
CO103.1	2	2	1	3	2	1	2		
CO103.2	2	2	1	3	2	1	2		
CO103.3	2	2	1	3	2	1	2		
CO103.4	2	2	1	3	2	1	2		
CO103.5	2	2	1	3	2	1	2		

COURSE CONTENTS

UNIT	TOPIC	CONTENTS	Mapped CO'S
1	ATOMIC STRUCTURE AND CHEMICAL BONDING	Elementary idea of fundamental particles of atom –their mass, charge, location. Ruther ford's and Bohr's model of an atom. Bohr Burry scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital .Hunds rule and filling of orbitals by Aufbau principle. (atomic no upto30) Paulis exclusion principle.. Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, fission and fusion. Bonding: Nature of bonds- Electrovalent, Co-valent, co-	CO103.1, CO103.5

		ordinate and hydrogen bond.	
2	THEORIES OF IONISATION,ELECTROCHEMISTRY ,FUEL CELLS. WATER	Arrhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indicatiors (acidimetry and alkalimetry).Electrolytes and non-electrolytes,Electrolysis, Electrolytic cell, Electrodes. Mechanism of electrolysis , Electrochemical series. General idea of fuel cells and its application. Solar cells and panels. Faraday's laws of electrolysis, Numerical problems on Faradays Law, Applications of electrolysis-electroplating, Electro refining. Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful – effects of hard water in boiler. Determination of hardness of water by O. Hehner's method, EDTA and soap solution method.	CO103.2, CO103.3, CO103.5
3	METALS AND ALLOYS , CORROSION	Physical and chemical properties of metals, copper, iron, aluminum. General principal of metallurgy, minerals/ ores, ore dressing, roasting ,smelting, bassemerisation, fluxes, purification . Explanation of alloying purposes, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloys. Corrosion, types of corrosion, factors effecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control.	CO103.2, CO103.3, CO103.5

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4	ENGINEERING MATERIALS	Glass: Basic raw materials and composition of glass, varieties of glass and annealing of glass. Cement : Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories : Meaning, characteristics , use of common refractory materials. Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash and fire point and cloud point, emulsification number, viscosity. Nano materias: Introduction and applications	CO103.2, CO103.3, CO103.4 CO103.5
5	NON METALLIC COMPOUNDS AND FUELS	Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters , Bakelite. Synthetic fibers – nylon, rayon, decron, and polyesters. Definition ,characteristics , classification and properties of insulators. Glass, wool and thermocole. Idea about rubber and vulcanization. Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and cetane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation. Fire extinguishers – Description and use.	CO103.2, CO103.3, CO103.4 CO103.5

SUGGESTED SPECEFICATION FOR QUESTION PAPER DESIGN

UNIT NO	TITLE	TEACHING HRS	TENTATIVE DISTRIBUTION OF MARKS			
			R LEVEL	U LEVEL	A LEVEL	TOTAL
1	ATOMIC STRUCTURE AND CHEMICAL BONDING	18	02	08	04	14
2	THEORIES OF IONISATION,ELECTROCHEMISTRY ,FUEL CELLS. WATER	18	04	04	06	14

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COURSE TITLE : CHEMISTRY SEMESTER-II

3	METALS AND ALLOYS , CORROSION	18	06	06	02	14
4	ENGINEERING MATERIALS	18	02	08	04	14
5	NON METALLIC COMPOUNDS AND FUELS	18	02	08	04	14

LIST OF EXPERIMENTS

S.NO.	NAME OF THE EXPERIMENT	CO
1	To identify one Anion and Cation in a given sample solution (atleast 5 samples)	CO 103.1, CO 103.4, CO 103.5
2	Determination of flash point and fire point of a given sample of oil by any apparatus	CO 103.4, CO 103.5
3	Determination of viscosity by Red Wood Viscometer no. 1 or no.2.	CO 103.4, CO 103.5
4	Volumetric Analysis: Acid base titration Determination of strength of ferrous ammonium sulphate.	CO 103.1, CO 103.4, CO 103.5
5	Determination of hardness of water by any two methods: (i)EDTA Method (ii)Soap Solution Method. (iii)Determination of hardness of water by O. Hehner's method.	CO 103.1, CO 103.4, CO 103.5
6	Determination of solid content in the given sample of water.	CO 103.1, CO 103.4, CO 103.5
7	Determination of percentage of moisture in the given sample of coal by proximate analysis	CO 103.1, CO 103.4, CO 103.5

SUGGESTED TOPICS FOR SURVEY/ASSIGNMENT

1. List of commercially available (different brands) lubricants and their use in different areas
2. Protective coatings- survey of commercially available coating materials
3. Survey of different brands of cements . Compare the setting time and strength.
4. Survey the different types of plastics with pictures and sample materials.
5. Survey of fibres . Compare the appearance and properties.
6. List out the raw materials and their sources used by the cement industries in Madhya Pradesh
7. List out some useful metals in electrical industry and their properties.
8. Classify and compare chemical cells and on the basis of their working .

9. list the manufacturing units of paints and the raw materials used.
10. Tabulate the description of at least ten elements with the following information-name, electronic configuration, who discovered, where is it found and uses and industrial applications

REFERENCES

PHYSICAL CHEMISTRY
BAHL AND TULI

INORGANIC CHEMISTRY
SATYAPRAKASH

MODERN TEXT BOOK OF APPLIED CHEMISTRY
DR. G. C. SAXENA, JAIN PRAKASHAN, INDORE

ENGINEERING CHEMISTRY
RAO AND AGARWAL

POLYMER CHEMISTRY
O.P. MISHRA

APPLIED CHEMISTRY
DR. G. C. SAXENA, DEEPAK PRAKASHAN, GWALIOR

APPLIED CHEMISTRY
SHRIVASTAVA & SINGHAL, PBS PUBLICATION, BHOPAL

ENGINEERING CHEMISTRY
UPPAL

ENGINEERING CHEMISTRY
P.C. JAIN

पोली0 रसायन विज्ञान – डा0 शर्मिला जैन
प्रायोगिक रसायन विज्ञान – डा0 शर्मिला जैन

NANOTECHNOLOGY: FUNDAMENTALS AND APPLICATIONS -MANASI KARKARE
PRINCIPLES OF NANOSCIENCE AND NANOTECHNOLOGY: M.A.SHAH
INTRODUCTION OF NANOTECHNOLOGY: CHARLES P.POALE &FRANK J. OWENS

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OUTCOME BASED CURRICULUM

Name of Scheme : OCBC-2019 **COURSE CODE :6801**

COURSE TITLE : COMMUNICATION SKILLS IN ENGLISH **(**COMMON FOR ALL BRANCHES**)**

Semester : I/II **Total Contact Hours: 90**

RATIONALE:

The course aims at enabling the students to develop Listening, Reading, Speaking and Professional Writing skills in English Language as required in present professional environment to enhance their employability and career prospects. This course is therefore '**practical'** in orientation.

COMPETENCY:

The aim of this course is to facilitate the students to develop competency in both spoken and written communication in English.

COURSE OUTCOMES (COs):

The Theory component, Practical Learning experiences and the relevant soft skills associated with the course are to be taught, conducted and developed so that the student demonstrates the following competencies sought by the industry for employability of the Diploma pass outs.

1. Demonstrate reading with reasonably correct pronunciations with comprehension.
2. Express orally and listen attentively to communicate the meaning of spoken material in English.
3. Formulate grammatically correct sentences in English using general purpose words.
4. Apply principles of effective communication in oral and written professional communication.

PRE-REQUISITES:

The first year Diploma students having basic knowledge of English Grammar of Secondary level and having some exposure to Listening, Speaking, Reading and Writing Skills in English language will be the target group.

The course being practical in orientation essentially requires intensive practice sessions involving committed and active participation of each student individually as well as in group, in class and also besides the class through a self-learning environment that promotes use of diverse open access learning resources available today.

TEACHING AND EXAMINATION SCHEME:

Teaching scheme (90 days in semester) Study hours (per week)				**EVALUATION SCHEME**						**TOTAL MARKS**
				THEORY			**PRACTICAL**			
L	T	Pr	Credit	ESE Paper-3Hrs Max Min	PA(PT+MP) Max Min	Total Marks	ESE Marks Max Min	PA Max Min	Total Marks	THEORY+ PRACTICAL
3	--	3	5	70 22 Marks	20+10=30 00 Marks	100	30 10	20 00	50	150

LEGENDS:

L :- Lecture (includes all learning experiences designed by the teacher to facilitate conceptual understanding)

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T :- Tutorial
Pr :- Practical
ESE :- End semester evaluation.
PA :- Progressive Assessment (Internal Assessment by Teacher)
PT :- Progressive Test (20marks)–Total of two Progressive Tests of 10marks each.

MP :- Micro-Project [Topics to be assigned at the beginning of the semester, requiring at least 08-10hours of guided engagement and requiring : **submission** (hard copy for Internal Progressive Assessment of Micro-Project in Theory component-10 marks) and **presentation** using presentation aids or tools (for Practical ESE –of 10 marks before external examiner), so as to integrate two or more Course Outcomes (COs), Unit Outcomes(UOs), Practical Outcomes (PrOs), and Affective Domain Outcomes (ADOs)]

ESE (Theory component) – will be assessed through Theory Paper of 70 Marks of 3 hours duration.

ESE (Practical component) –will be assessed in the presence of an External Examiner on the basis of-

1. Presentation of Micro Project allotted by the teacher.(10 marks)
2. Reading aloud a passage with correct pronunciation and answering simple questions. (10 marks)
3. Answering the questions asked by the examiner based on the practical exam question paper.(10 marks)

COURSE DELIVERY:

Unit	Topic	Teaching Hours		
		Theory	Practical	Total
I	**COMPREHENSION AND VOCABULARY**	10	06	16
II	**APPLIED GRAMMAR**	10	14	24
III	**PRINCIPLES OF EFFECTIVE COMMUNICATION AND BUSINESS CORRESPONDENCE**	12	12	24
IV	**TECHNICAL REPORT WRITING**	08	08	16
V	**PARAGRAPH WRITING AND PRECIS WRITING**	05	05	10
Total Contact Hours		45 hours	45 hours	**90 hours**

MAPPING COs AND POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	1	1	1	3	3	3
CO2	1	1	1	1	2	3	3

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CO3	1	1	1	1	2	3	2
CO4	1	1	1	1	3	3	3

The following contents have to be taught and assessed:

Unit	Topic and Sub-topics	Unit Outcomes (UOs)		Hours		CO
		Writing Skills	Speaking Skills	L	P	
UNIT I **COMPREHENSION AND VOCABULARY**	**Passages** in the prescribed Text book : 1. The Language of Science 2. Safety Practices 3. Nonconventional Sources of Energy 4. Entrepreneurship **Short Stories** in the prescribed Text Book : 1. 'A Letter to God' written by *Gregorio Lopex Y. Fuentes* 2. 'An Astrologer's Day' written by *R.K. Narayan* One word substitution,	Write short answers of the questions based on specified Passages and Short Stories. Form correct sentences using **new words** in the specified Passages and Short Stories. Write summary, moral and characterization of the short stories prescribed. Give one word substitution, Write meanings, or expanded form of the compound-	Listen and Pronounce the words correctly in the passage while reading. Listen to the questions based on the passages and answer each question orally. Listen the story during lecture. Read the story loudly with proper pronunciation and voice modulation. Read the summary loudly with proper pronunciation and voice modulation. Speak moral and brief summary of any one of the two short stories	10	06	CO1, CO2, CO3

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	Word-expansion, Common Synonyms and Antonyms.	words (from the text)	prescribed. Listen, speak, record, compare and practice correct pronunciation of the new words.			
UNIT II APPLIED GRAMMAR	**Determiners** a, an, the, some, any, much, many, each, every, all, no, none, few, a few, little, a little, plenty of, a lot of, a great deal of.	Use appropriate determiners in the given situations.	Formulate sentences with correct use of determiners.	10	14	CO2 CO3
	Auxiliary Verbs Be: is, am, are, was, were, Do: does, did Has/have: had Will: would, Can: could, Shall: should, May: might, Must: has/have to, am to, had to Need, Dare, Ought to, Used to	Use correct auxiliary verbs in the given sentences and situations.	Speak using appropriate auxiliary verbs in the given context.			
	Subject-verb Agreement	Use verb that agrees with the subject in the given sentence.	Speak sentences with correct subject-verb agreement in any given situation.			
	Tenses	Rewrite the sentences using correct form of the **verb** in the given sentences.	Construct and speak grammatically correct sentences using appropriate form of the verbs.			

	Question tags and short form answers	Write correct Question Tags after sentences. Answer in short forms.	Listen to videos on situational conversations and converse on routine situations using question tags. Reply in short forms.			
	Voice	Change the expressions from active to passive voice and vice-versa as appropriate.	Identify the appropriateness of active or passive voice in a given situation. Use correct voice to get the desired response.			
	Prepositions	Apply appropriate prepositions to communicate desired meaning.	Use prepositions to make meaningful sentences.			
UNIT III **PRINCIPLES OF EFFECTIVE COMMUNICATIO N AND BUSINESS CORRESPONDENC E**	Definition of Communication, Communication Process, Non-verbal Communication (Body language) Principles (7Cs) of effective communication, Barriers in communication and the ways to overcome them. Semantic Barriers Physical Barriers Socio-Psychological Barriers Organizational Barriers Business Letters : Parts, mechanics and format. Characteristics of good business letters. Application for Job with CV, Enquiry, Order, Complaint.	Define communication Describe Communication Process and its types. Enumerate and explain Principles of Effective Communication . Enlist Barriers in communication and ways to overcome them. Draft the specified letters.	Use appropriate body language and voice modulation for effective presentation skills. Deliver a short presentation (2 to 3 minutes) on any of the topics assigned from the syllabus individually, eg. Process of communication , Non verbal communication , Any three principles of effective	1 2	1 2	CO2 CO3 CO4

			communication , Barriers (any one type).			
UNIT IV TECHNICAL REPORT WRITING	Meaning and Characteristics of a good Technical Report, Types of Reports Report Writing (in the form of letter) 1.Progress Report 2.Proposal Report 3. Report on Industrial Accident	Briefly describe a Technical Report and its Characteristics. Draft the specified reports.	Orally present (read) the Technical Reports drafted by you.	08	08	CO2 CO3 CO4
UNIT V PARAGRAPH WRITING AND PRECIS WRITING	Paragraph Writing (150 words) on topics of general interest e.g., Pollution, Ragging in colleges, Internet revolution, Solar energy, Entrepreneurship, Importance of Communication Skills. Unseen passages from various sources (appropriate for Diploma Level) Comprehension exercises, Precis writing Giving a suitable title to the passage.	Develop paragraphs on any four topics from the specified list. Write answers of the questions based on the given unseen passage. Write précis of the given passage and give a suitable title.	Read the paragraph aloud and deliver the same orally. Read the unseen passage and the précis aloud.	05	05	CO1 CO3 CO4

SUGGESTED LIST OF PRACTICAL EXERCISES TO BE CONDUCTED FOR EXPECTED PRACTICAL OUTCOMES (PrOs)

S.No	**Practical Outcomes of Listening skills, Speaking skills, Reading skills (silent and loud) and Writing skills to be attained using pre-prepared exercises from text book or other appropriate resources in the Language Laboratory or in the class room)**	**Unit**	**Hours for Practicals**
1.	Appreciate reading passages or articles from various sources (including passages and stories prescribed in the Text Book) with correct pronunciation and voice modulation. Answer the questions based on the given passage-orally as well as in writing.	I & V	4
2.	Repeat words on language lab software after listening them, record, compare and practice for accuracy in pronunciation. Online dictionary can also be used.	I	4
3.	Apply correct form of the given words in the sentences and read them aloud. Give one word substitutes for word expansions.	I	2
4	Employ common synonyms and antonyms in sentences.	I	2
5.	Relate determiners correctly in the given sentences and read aloud.	II	1

6.	Apply auxiliary verbs correctly in the given sentences and read aloud.	II	1
7.	Relate verb form that agrees with its subject and read the sentence aloud.	II	1
8.	Rewrite sentences using correct form (tense) of the given verb and read aloud.	II	2
9.	Form question tags and frame short form answers for short conversations.	II	1
10.	Convert the voice from active to passive and vice-versa appropriately.	II	2
11.	Apply appropriate prepositions in the given sentences and read the sentences aloud.	II	2
12.	Listen and view short videos on routine situations (of elementary level) like: greeting, introducing oneself and others, bidding good-bye, expressing thanks, apologizing, seeking attention, seeking and giving permission, enquiring (at railway station, airport, hotel reception) making requests, inviting, seeking directions, giving directions, agreeing, disagreeing, expressing likes and dislikes, seeking help, offering help, conversing with shopkeeper, conversing with doctor etc. Then repeat, practice and enact the dialogues through Role play.	II & III	4
13.	View and listen video clippings of job **interviews** for demonstrating the dos and don'ts of facing interview.	III	2
14.	Draft Business letters (all four types) as assigned by the teacher.	III	5
15.	Write Technical Reports (any two for each student) assigned by the teacher.	IV	6
16.	Compose paragraph of about 120 words on the given topic (each student to write three paragraphs).	V	2
17.	Write précis of the given unseen passage and read aloud. Give a suitable title.	V	2
18.	Translate simple sentences from Hindi to English and vice-versa.	II	2

Note:

The list of Practical Learning Outcomes and the study hours given in the above table is only suggestive and indicative. More such practical exercises can be added or substituted to attain the COs and PrOs and the desired competencies. A judicious mix of Practical exercises or language activities/games spread in ***45 hours*** *of Practical work with variety of Learning Outcomes of Reading aloud correctly, Word usage and Pronunciation practice, Formulating grammatically correct sentences, routine and situational Conversation practice, Drafting skills (Letters and Reports) and Composing skills (paragraphs and précis) can be undertaken to attain the desired outcomes.*

TOPICS FOR MICRO PROJECT :

Each student has to be assigned a topic for Micro-Project in the beginning of the semester. Student will submit hard copy of the Micro-Project for internal Progressive Assessment (Theory) and will prepare one short presentation of 3 minutes duration for End Semester Evaluation (Practical)using various aids and tools e.g., charts, power point, graphics, models, simulations, dialogues, examples and illustrations, role plays etc. on topics like -

1. Process of Communication
2. Verbal and Non-verbal communication
3. Principles of Effective Communication
4. Barriers in Communication
5. Entrepreneurship
6. How language of Science is different from language of common use?
7. Importance of communication skills.
8. Non Conventional Sources of Energy.

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9. Safety Practices
10. Characteristics of a good technical report.
11. Format of a Technical Report and Sample Reports
12. Format of a business letter and Sample business letters
13. Characteristics of good Letters.
14. Advantages and disadvantages of social media.

or other relevant topics from the syllabus itself (as approved by the teacher).

RUBRICS FOR EVALUATION OF MICRO-PROJECT: Internal Progressive Assessment (Theory)

1	Organization of content and relevance	Cognitive Domain	04 marks
2	Neatness in written content	Psychomotor Domain	03 marks
3	Timely submission and enthusiasm	Affective Domain	03 marks
	TOTAL		**10 marks**

RUBRICS FOR EVALUATION OF MICRO-PROJECT: ESE (Practical) by External Examiner

1.	Organization of content (Knowledge and Relevance)	Cognitive Domain	04 marks
2.	Presentation Skills and Body Language	Psychomotor Domain	03 marks
3.	Confidence, Enthusiasm and Positive Attitude	Affective Domain	03 marks
	Total		**10 marks**

PATTERN OF INTERNAL EVALUATION FOR PROGRESSIVE ASSESSMENT (PRACTICAL)

TOTAL MARKS-20

ASSIGNMENT : 5 marks
TEST OF SPEAKING SKILLS: 15 marks

ASSIGNMENT : One **Assignment** comprising of a judicious mix of vocabulary building, grammar exercises, drafting letters and reports and composition skills to be allotted to students and to be submitted as a single document or file by each student.

Or

Solving a set of previous years' Question Papers (End Semester Theory Exams) can also be allotted for assignment: **5 Marks.**

RUBRICS FOR EVALUATION of Assignment- Internal Progressive Assessment (Practical)

1	Conceptual understanding and Completeness	Cognitive Domain	02 marks
2	Neatness in written content	Psychomotor Domain	02 marks

3	Timely submission and enthusiasm	Affective Domain	01 mark
	TOTAL		**05 marks**

TEST OF SPEAKING SKILLS: (15 Marks)

Tests for evaluating Speaking skills are to be conducted by the subject teacher for Internal Assessment of Listening and Speaking skills. These tests may be conducted in pairs or in groups to develop interpersonal skills and also to manage time constraint. If feasible, the content delivered by the students may be recorded for giving tips on improving his communication skills.

Duration of speaking time for each student : as specified in Part I and Part II

PART 1 – SELF-INTRODCTION Time : 2 minutes for each student

Student will introduce himself incorporating the information sought in the questions below:

1. What is your name?
2. Where are you from?
3. What do you do?
4. What is your qualification?
5. Tell something about your school?
6. Mention your achievements if any.
7. Which is your favourite subject and why?
8. What are your hobbies?
9. What do you like about your city/village?
10. What are your strengths and weaknesses?
11. What is your aim?

PART 2- COVERSATIONAL SKILLS– Role Play –in pairs or in groups (Each role play of maximum three minutes duration). In this part of the test, candidates in pairs will be asked to enact role play on a routine conversational situation for assessment by the teacher.

Routine situations of elementary level may be allotted e.g., greeting, introducing oneself and others, bidding good-bye, expressing thanks, apologizing, seeking attention, seeking and giving permission, enquiring, making requests, inviting, seeking directions, giving directions, agreeing, disagreeing, expressing likes and dislikes, seeking help, offering help, answering telephone calls, leaving and taking telephonic messages, simple conversations between a shopkeeper and a customer, hotel receptionist and a customer, a doctor and a patient, librarian and student etc.

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RUBRICS FOR EVALUATION OF SPEAKING SKILLS-

1	Use of grammar and vocabulary in content	05
2	Pronunciation, intonation and voice clarity	05
3	Interpersonal interface and non-verbal component	05
	TOTAL	**15**

SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit	Topic	Teaching Hours			Distribution of Theory (ESE) Marks			
		Total	Theory	Practical	R Level	U Level	A Level	Total Marks
I	**READING COMPREHENSION AND VOCABULARY**	16	10	06	4	5	5	14
II	**APPLIED GRAMMAR**	24	10	14	2	2	10	14
III	**PRINCIPLES OF EFFECTIVE COMMUNICATION AND BUSINESS CORRESPONDENCE**	24	12	12	2	6	6	14
IV	**TECHNICAL REPORT WRITING**	16	08	08	2	5	7	14
V	**PARAGRAPH WRITING AND PRECIS WRITING**	10	05	05	2	7	5	14
		90 Hrs	45Hrs	45Hrs	12	25	33	70

Legends*: R=Remember, U=Understand, A=Apply and above (Bloom's Revised taxonomy)*
Note*: This specification table provides general guidelines to assist students for their learning and to teachers to teach and assess students with respect to attainment of LOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary from the above table.*

Question Paper Pattern:

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S.No	Source	Question	Type	Marks
1.	Unit I Comprehension Passages	Short answer questions based on the passages prescribed.	Attempt any five out of eight.	5x1=5
2.	Unit I Comprehension Short Stories	Long answer questions (summary or characterization with moral) based on short stories prescribed.	Attempt any one out of two	5x1=5
3.	Unit I Vocabulary	Vocabulary	Give one word substitutions. (4 items) **or** Give synonyms or antonyms. (4 items)	4x1=4
4.	Unit II Applied Grammar	**Determiners** – Fill in the blanks using suitable Determiners	Two sentences are to be given.	1x2=2
5.	Unit II Applied Grammar	**Auxiliary Verbs** Fill in the blanks using suitable Auxiliaries	Two sentences are to be given.	1x2=2
6.	Unit II Applied Grammar	**Subject-verb Agreement**	Two sentences are to be given.	1x2=2
7.	Unit II Applied Grammar	**Tenses** Fill in the blanks using Appropriate tense of the given verb.	Two sentences are to be given.	1x2=2
8.	Unit II Applied Grammar	**Question tags and short form answers** Add question tags. Give short form answers.	Two sentences are to be given - one for question tag and one for short form answer.	1x2=2
9.	Unit II Applied Grammar	**Voice** Change the voice in the following sentences.	Two sentences are to be given.	1x2=2
10.	Unit II Applied Grammar	**Prepositions** Fill in the blanks using Suitable Prepositions.	Two sentences are to be given.	1x2=2
11.	Unit III Principles of Effective Communication	Describe Principles of Effective Communication. Or Describe Barriers in effective communications and ways to overcome them.	Answer any one of the two questions.	7x1=7
12.	Unit III Business Correspondence	Draft Job Application with CV or Letter of Enquiry or Letter Placing Order or	Draft any one of the two letters given.	7x1=7

		Letter of Complaint		
13.	Unit IV Report Writing	What is a technical report? Mention various types of report. or Write characteristics of a good technical report?	Attempt any one question on Principles of Report writing.	7x1=7
14.	Unit IV Report Writing (letter form)	Proposal Report Progress Report Trouble Report (Industrial accident)	Draft any one of the three technical reports given.	7x1=7
15.	Unit V Paragraph Writing	Write a Paragraph of about 120 words	Write paragraph on any one of the four topics given.	6x1=6
16.	Unit V Unseen passage and Precis Writing	Unseen Passage and Comprehension	(a)Write précis or Answer comprehension questions based on the unseen passage. (four questions to be given).	6x1=6 Or 1.5x4=6
17.	Unit V Unseen Passage		(b) Give suitable title to the passage. (unseen passage)	2
			Total Marks	**70**

Guidelines for Question Paper Setting:

1.The question paper must be based on the pattern given above without changing the weightage of marks fixed for each category. (As per model question paper)
2. The question paper pattern provided should be adhered to.
3. Care must be taken so that there is only one possible answer for all 'fill in the blanks' or single word answer questions.
4. Objective type or Multiple Choice questions of 8 marks from all the five units to be asked in the question paper. Marks may subsequently be adjusted in the Question Paper Pattern to accommodate objective / multiple choice questions.

Suggested Books:

S.No.	Title	Author	Publisher
1.	Communication Skills for Technical Students (Text Book)	TTTI Bhopal	Somaiya Publications Mumbai, Delhi
2.	A Course in Technical English Book Two	TTTI Bhopal	Somaiya Publications Mumbai, Delhi
3.	Business Correspondence and Report Writing	R.C. Sharma and K. Mohan	Tata Mcgraw Hill New Delhi
4.	Living English Structure	W. Stannard Allen	Pearson

5.	Essential English Grammar	Raymond Murphy	Cambridge University Press, New Delhi.
6.	Communication Skills for Engineers and Scientists	Sangeeta Sharma Binod Sharma	PHI Learning Pvt. Ltd. New Delhi
7.	Contemporary English Grammar, Structures and Composition	David Green	Macmillan
8.	Developing Communication Skills	K. Mohan and Meera Banerjee	Macmillan India Ltd. New Delhi
9.	Thesaurus	Rodgers	Orient Longman
10.	Essentials of Technical Communication	Asraf Rizvi	Tata Mcgraw Hill
11.	A Course in Listening and Speaking I&II	V.Sasikumar, Kiranmai Dutt and Geeta Rajeevan	Foundation Books Cambridge House New Delhi
12.	Exercises in Spoken English Part I-III	CIEFL Hyderabad	Oxford University Press
13.	English for Practical Purposes	Z.N.Patil et.al.	Macmillan
14.	English Language Laboratories: A Comprehensive Manual	Nira Konar	PHI Learning Pvt. Ltd. New Delhi
15.	A Manual for English Language Laboratories	D. Sudha Rani	Pearson
16.	Body Language: How to read Other's Thoughts by their Gestures	Allan Pease	Sheldon Press,London

SOFTWARES/LEARNING WEBSITES

i) https://www.britishcouncil.in/english/learn-online
ii) http://learnenglish.britishcouncil.org/en/content
iii) https://www.cambridgeenglish.org/learning-english/activities-for-learners
iv) http://www.talkenglish.com..
v) www.speaktoday.com
vi) Speak English Easy (DVD) TBC Educational Series
vii) Spoken English (DVD) TBC Educational Series
viii) Massive open online courses (***MOOCs***) may be used to teach various topics/subtopics.
ix) Language Lab equipped with language software with facilities of listening and speaking practice

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
OUTCOME BASED CURRICULUM

NAME OF THE PROGRAMME: (COMMON FOR ALL BRANCHES)
Name of Scheme :OCBC -2019 **COURSE CODE: 6804**

COURSE TITLE : MATHEMATICS SEMESTER-I

COURSE OUTCOMES

C104.1	Describe the algebraic processers to solve above equations by means of different concepts, explain combinatory and solve their problems.
C104.2	Determine the identities of trigonometry and solve their problems.
C104.3	Explain two dimensional co-ordinate geometry from concept of point up-to straight lines and solve its problems.
C104.4	Analyse the data by means of statistical processes.
C104.5	Explain the concepts of calculus, derive different methods of differentiation and integration and solve its problems
C104.6	Define concept of Vector Algebra and its application and calculate problems on it.

CO -PO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
C104.1	3	3	3	3	3	3	3	3	3	3
C104.2	3	3	3	3	3	3	3	3	2	-
C104.3	3	3	2	2	2	2	2	1	3	-
C104.4	3	3	3	3	3	3	3	3	3	3
C104.5	3	3	3	3	3	3	3	-	-	2
C104.6	3	3	3	3	2	2	2	3	3	2

Course Objectives:

1. Apply the concept of matrices and determinants and their applications to solve the system of linear equations in different engineering field.
2. Apply and evaluate trigonometric concept in vector engineering field.
3. Apply the coordinate and vector algebra in solving the problems of statics and mechanics.
4. Create the basic concept of calculus.

COURSE CONTENTS

UNIT	CONTENTS	HRS	CO

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COURSE TITLE : MATHEMATICS SEMESTER-I

Unit-1 ALGEBRA	1.1 Permutation - Meaning of factorial n - Permutation of 'n' dissimilar thing taken 'r' at a time, 1.2 Combination - Combination of n dissimilar things taken 'r' at a time, 1.3 Binomial Theorem - Statement of the theorem for positive integer - General Term, Middle term, Constant term 1.4 Partial Fractions - Define a proper - Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors. 1.5 STATISTICS- Measures of Central tendency (Mean, Mode, Median) 5.2 Measures of Dispersion (Mean deviation, standard deviation) 1.6 Complex Number Algebra of Complex Numbers - Polar form.	**26**	C104.1, C104.4
Unit-2 TRIGONOMETRY	2.1 Allied angles. 2.2 Trigonometrical ratios of sum and difference of angles, (Only statement) 2.3 Sum and difference of trigometric ratios (C-D formula) 2.4 Multiple angles (Only double angle and half angle) 2.5 Properties of triangle (without proof)	**21**	C104.2
Unit-3 DETERMINANT AND MATRIX	3.1 Determinant - Concept & principles of determinants - Properties of determinant - Simple examples. Definition of Matrix. 3.2 Types of Matrix. - Row, Column, Square, Unit, Upper and lower triangular, Symmetric & Skew Symmetric, Singular and non Singular Matrices. 3.3 Adjoint of a Matrix. 3.4 Inverse of a Matrix.	**21**	C104.1
Unit-4 CO-ORDINATE GEOMETRY AND VECTOR ALGEBRA	4.1 Co-ordinate System : Cartesian and Polar. 4.2 Distance, Division, Area of a triangle. 4.3 Locus of a point and its equation. 4.4 Slope of St. Line - Angle between two St. lines. - Parallel and perpendicular St. lines. 4.5 Standard and general equation of St. line. Point of intersection of two st lines. 4.6 Concept of Vector and Scalar Quantities. 4.7 Different types of vectors. 4.8 Addition and subtraction of vectors.	**26**	C104.3, C104.6

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COURSE TITLE : MATHEMATICS SEMESTER-I

	4.9 Components of a vector 4.10 Multiplication of two vectors - Scalar Product - Vector Product - Applications (Work done, power &reactive power		
Unit-5 **DIFFERENTIATION AND INTEGRAL CALCULUS**	5.1 Define constant, variable, function. 5.2 Value of the function 5.3 Concept of limit of a function. 5.4 First Principle of Differentiation. 5.5 Standard results. 5.6 Derivatives of sum, difference, product, quotient of two functions. 5.7 Diff. coeff. of --function of a function, implicit function, parametric function. 5.8 Logarithmic Differentiation . 5.9 Definition of Integration as a inverse process of differentiation. 5.10 Standard Results (including inverse function) 5.11 Methods of Integration - Substitution - Integration by parts - Breaking up into partial fraction 5.12 Concept of Definite Integral	**26**	**Co5**

After completing this course:

(1) Students will be able to understand concept of permutation, combination, binomial expansion, partial fraction ,data and their classification. They will be able to calculate mean, median, mode, mean deviation and standard deviation.
(2) Students will be able to learn different identities of trigonometry and to apply them in different problems of trigonometry.
(3) Students will be able to know the concept & properties of determinants and different types of matrices and their arithmetic operations. They will be able to find the inverse of a given matrix.
(4) Students will be able to locate different points in a coordinate plane. They will be able to find the equation of a line in different form and distinguish scalars and vectors. They will be able to know dot and cross product of vectors and their different applications.
(5) Student will be able to understand the concept of function, limit, derivative and integreation

SUGGESTED SPECEFICATION FOR QUESTION PAPER DESIGN

UNIT NO	TITLE	TEACHING HRS	TENTATIVE DISTRIBUTION OF MARKS			
			R LEVEL	U LEVEL	A LEVEL	TOTAL

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
OUTCOME BASED CURRICULUM

NAME OF THE PROGRAMME: (COMMON FOR ALL BRANCHES)
Name of Scheme :OCBC -2019 **COURSE CODE: 6804**

COURSE TITLE : MATHEMATICS SEMESTER-I

1	ALGEBRA	26	6	4	4	14
2	TRIGONOMETRY	21	8	3	3	14
3	DETERMINANT AND MATRIX	21	5	5	4	14
4	CO-ORDINATE GEOMETRY AND VECTOR ALGEBRA	26	6	4	4	14
5	DIFFERENTIATION AND INTEGRAL CALCULUS	26	4	6	4	14
	TOTAL	120	29	22	19	70

REFERENCE BOOKS

1. Mathematics for Polytechnics Vol. I and II
   - Prepared by T.T.T.I. Bhopal
2. Differential Calculus
   - Gorakh Prasad
3. Integral Calculus
   - Gorakh Prasad
4. Co-ordinate Geometry
   - S.L. Loni
5. Engineering Mathematics (M.P. Hindi Granth Akadami)
   - Dr. S.K. Chouksey & Manoj Singh
6. Mathematical Statistics
   - Ray and Sharma
7. Higher Engineering Mathematics
   - B.S. Grewal

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COURSE TITLE : MATHEMATICS SEMESTER-I

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OUTCOME BASED CURRICULUM

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Name of Scheme :OCBC -2019 **COURSE CODE: 6804**

COURSE TITLE : MATHEMATICS SEMESTER-I

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
OUTCOME BASED CURRICULUM

NAME OF THE PROGRAMME: AUTOMOBILE ,MECH, RAC, CHEMICAL , CEMENT, PRODUCTION, CIVIL, CTM, PRINTING and TEXTILE TECH

Name of Scheme : OCBC-2019 **COURSE CODE :6802**

COURSE TITLE :PHYSICS SEMESTER-II

COURSE OUTCOMES

C102.1	Have an understanding of the fundamental concepts and techniques in the various topics related to engineering physics and students should be able to apply the knowledge analytically
C102.2	To apply practical skill on the basis of theoretical knowledge imparted , identify analyse , differentiate and interpret logical sequence of field problems with the study of physics
C102.3	The students should be able to measure given dimensions by using appropriate instruments accurately and should be able to select proper measuring instrument on the basis of range, least count and precision
C102.4	Enable to understand principles, laws, facts, concepts, using mathematical techniques and experimental determination of values of different physical properties of materials by studying physics.
C102.5	Apply the principles of physics and its significance in engineering system and technological advances
C102.6	Equip the students with skills of taking ethical responsibility in scientific thinking , problem solving and laboratory techniques

CO-PO MAPPING

Course Outcomes	P01	P02	P03	P04	P05	P06	P07
C0102.1	3		2	2	1		2
C0102.2	3	1	2	3			1
C0102.3	3	1	2				3
C0102.4	1	3		2	2	1	1
C0102.5	3	3	2	1	3	2	2
C0102.6	1	1			2	2	1

	Content (Theory)	Hrs/Unit	Mapped CO'S
Unit – 1 UNITS, DIMENSIONS & MEASUREMENTS	**1.1 Measurement** - Need of Measurement in engineering and science, unit of a physical quantity, requirements of standard unit, systems of units **1.2 Accuracy** - Accuracy, Precision of instruments, Errors in measurement, Estimation of errors **1.3 Instruments** - Basic Measuring instruments- Vernier Caliper, Micrometer screw gauge, ammeter, voltmeter with their least count, range, accuracy and precision	15	C102.1, C102.2, C102.3, C102.4

Name of Scheme : OCBC-2019 **COURSE CODE :6802**
COURSE TITLE :PHYSICS SEMESTER-II

Unit – 2 GENERAL PROPERTIES OF MATTER	**2.1 Elasticity :** Deforming force, Restoring force, Elastic and plastic body, Stress and strain with their types, Hooke's law, Stress strain diagram, Young's modulus, Bulk modulus, Modulus of rigidity and relation between them(no derivation), (simple problems). (Simple problems) Stress strain diagrams. **2.2 Surface Tension:** Forces—cohesive and adhesive, , angle of contact, shape of liquid surface in a capillary tube, capillary action with examples, relation between surface tension , capillary rise and radius of capillary (no derivation)(simple problem),effect of impurity and temperature on surface tension. **2.3 Viscosity :** Velocity gradient, Newton's law of viscosity, coefficient of viscosity ,streamline and turbulent flow, critical velocity, Reynold's number,(simple problems), Stokes law and terminal velocity(no derivation) ,buoyant (up thrust) force, effect of temperature & adulteration on viscosity of liquid.	20	C102.1, C102.2, C102.3
Unit – 3 HEAT AND THERMODYNAMICS	**3.1 Transmission of heat and expansion of solids -** Transmission of heat-conduction, convection and radiation, law of thermal conductivity, coefficient of thermal conductivity (simple problems), **3.2 Gas laws and specific heats of gases** Boyle's law, Charle's law, absolute temperature, Kelvin scale of temperature, general gas equation(no derivation)(simple problems),molar or universal gas constant, universal gas equation, standard or normal temperature and pressure (N.T.P.), specific heat of gases, relation between two specific heat (simple problems), thermodynamic variables, first law of thermodynamics (statement & equation only), isothermal, isobaric, isochoric & adiabatic processes (difference among these processes and equations of state) (simple problems).Second law of thermodynamics -Kelvin & Plank (statement & example)	20	C102.1, C102.3, C102.4,
Unit – 4 LIGHT	**4.1 Properties of light** Reflection and, refraction, Snell's law, physical significance of refractive index (simple problems), Total internal reflection, dispersion, diffraction and polarization of light (only introduction) **4.2 Wave theory of light & Interference** Newton's corpuscles theory of light, Huygen's wave theory, wave front, Types of wave front-spherical, cylindrical and plane Huygen's principle of propagation of wave front, Principle of superposition of waves, Interference of light, constructive and destructive interference, Young's experiment. Analytical treatment of interference, conditions	20	C102.1, C102.3, C102.3, C102.5

Name of Scheme : OCBC-2019 **COURSE CODE :6802**
COURSE TITLE :PHYSICS SEMESTER-II

	for stationary interference pattern. **4.3 Laser** Light amplification by stimulated emission of radiation, properties of laser, spontaneous and stimulated emission, population inversion, pumping methods, He-Ne laser- construction, working and application		
Unit – 5 MODERN PHYSICS	**5.1 Photo electricity** Plank's hypothesis, properties of photons, photo electric effect, laws and characteristics of photoelectric effect, Einstein's photoelectric equation,(simple problems), construction and working of photoelectric cell, applications of photoelectric cell **5.2 X-rays** Production of X-rays, types of X-ray spectra-continuous and characteristics, X-ray wavelength (simple problems), properties of X-rays, applications of X-rays.	15	C102.1, C102.3, C102.4, C102.3
	TOTAL	90	100

SUGGESTED SPECEFICATION FOR QUESTION PAPER DESIGN

UNIT NO	TITLE	TEACHING HRS	TENTATIVE DISTRIBUTION OF MARKS			
			R LEVEL	U LEVEL	A LEVEL	TOTAL
1	DIMENSIONS & MEASUREMENTS	15	5	4	5	14
2	GENERAL PROPERTIES OF MATTER	20	8	3	3	14
3	HEAT AND THERMODYNAMICS	20	6	4	4	14
4	LIGHT	20	7	3	4	14
5	MODERN PHYSICS	15	8	3	3	14
	TOTAL	90	34	17	19	70

PRACTICAL SKILLS

Sl. No.	Skills to be developed

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Name of Scheme : OCBC-2019 **COURSE CODE :6802**
COURSE TITLE :PHYSICS SEMESTER-II

1.	• **Intellectualskills-** o Proper selection of measuring instruments on the basis of range, least count, precision and accuracy required for measurement. o Analyze properties of matter & their use for the selection of material. o To verify the principles, laws, using given instruments under different conditions. o To read and interpret thegraph. o To interpret the results from observations and calculations.
2.	• **Motorskills-** o Proper handling of instruments. o Measuring physical quantities accurately. o To observe the phenomenon and to list the observations in proper tabular form. o To adopt proper procedure and precautions while performing the experiment. o To plot the graphs

Laboratory Experiments :

Sl. No.	Any 10 experiments to be performed
1.	Use of Vernier calipers for the measurement of dimensions of given object.
2.	Use of micrometer screw gauge for the measurement of dimensions of given object
3.	Verification of laws of refraction of light and determination of refractive index of glass slab
4.	Calculation of refractive index of refractive index of Glass of prism by i-δ method
5.	Determine of focal length of a convex lens by U-V method.
6.	Determination of the Young's modulus of steel by Searl's method.
7.	Determination of the surface tension of water by capillary rise method
8.	Plot characteristics of photoelectric cell (Photoelectric current verses intensity of light and voltage applied).
9.	Determine of focal length of a convex lens by Displacement method.
10.	Coefficient of Thermal conductivity by Searl's method.
11	Verification of Boylé law.
12	Measurement of unknown temperature using thermocouple.
13	Determine coefficient of viscosity of given oil using stoke's method.

Text and reference books:

Sl. No.	Title of the Book	Name of Authors	Publisher
1.	Physics – I &II	Resnik& Halliday	Wily Eastern Ltd.
2.	Physics. Part – I & II		NCERT

Name of Scheme : OCBC-2019 **COURSE CODE :6802**
COURSE TITLE :PHYSICS SEMESTER-II

3.	Applied Physics	Arthur Beiser	Tata McGraw- Hill
4.	Physics - I	V. Rajendram	Tata McGraw- Hill Publication
5.	Engineering Physics	Avadhanulu, Kshirsagar	S. Chand Publication
6.	Concept of Physics. Vol.- I &II	H. C. Verma	Bharati Bhavan Pub. & Distribution
7.	Engineering Physics	JOSHI	Tata McGraw- Hill
8.	अनुप्रयुक्त भौतिकी	Y. P. Singh and A. S. Tomar	Satya Prakashan, New Delhi
9	पोली0 भौतिक विज्ञान	डा0 अमित जैन	संजय पब्लिकेषन जयपुर ।