CURRICULLUM OF
LEVEL 03; 1ST SEMESTER

For

DIPLOMA VOCATIONAL IN
PRODUCTION TECHNOLOGY

(Effective FROM 2021-22 Sessions)

STATE COUNCIL FOR TECHNICAL EDUCATION & VOCATIONAL TRAINING,

ODISHA, BHUBANESWAR

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA									
TEACHING AND EVALUATION SCHEME FOR Level 03; 1ST Semester (D.Voc in Production Technology) (wef 2021-22)									
Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	End Sem Exams	Exams (Hours)	Total
		Theory							
Th.1		Language-I	4	-	-	20	80	3	100
Th.2		Applied Chemistry	4	-	-	20	80	3	100
Th.3		Applied Physics	4	-	-	20	80	3	100
Th.4		Applied Mathematics-I	4	-	-	20	80	3	100
		Total	*16*			*80*	*320*		*400*
		Practical							
Pr.1		Applied Chemistry Lab	-	-	3	25	50	3	75
Pr.2		Applied Physics Lab	-	-	3	25	50	3	75
		Student Centred Activities (SCA)	-	-	3	-	-	-	-
		Total			*09*	*50*	*100*		*150*
		On-Job-Training (OJT)							
		Operator – Conventional Turning (CSC/Q0110) **OR** Fitter – Fabrication (CSC/Q0303) **OR** Operator – Conventional Milling (CSC/Q0108) **OR** Assistant MMAW SMAW Welder (CSC/ Q 0202)	-	-	14	-	200	-	200
		Total			*14*		*200*		*200*
		Grand Total	**16**		**23**	**130**	**620**		**750**
Abbreviations: L-Lecturer, T-Tutorial, P-Practical. Each class is of minimum 55 minutes duration									
Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%									
SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAM etc. ,Seminar and SCA shall be conducted in a section.									
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester									

TH.1. LANGUAGE-I

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

RATIONALE:

Main objective of Mechanical Engineering is to produce goods and services for benefit to mankind. Such productions are done utilizing various resources like Men, Materials, machines and Money. Industrial engineering and quality control is the subject which allows optimized use of such resources and hence very important for a mechanical engineering.

COURSE OBJECTIVES:

After undergoing this course, the students will be able to:

- Identification of place for a new plant set up and systematic arrangement of machinery and shop for smooth production.
- Understanding of stock management and maintenance to reduce plant ideal time.

Topic Wise Distribution of Periods

Sl No.	Topic	Periods
1	Plant location and Layout Periods	10
2	Operations Research	12
3	Inventory Control	8
4	Plant maintenance	7
5	Inspection and Quality Control	15
6	Contemporary Quality Management concepts	8

DETAILED CONTENTS

Module 1: Reading comprehension (prescribed texts) and functional grammar

A variety of genres – short stories, expository pieces, biographies, poems, plays, newspaper and magazine excerpts have been included. Teaching of grammar has been integrated with the reading texts. The emphasis is on functional grammar.

The following ten prose texts and five poems have been selected for development of different reading skills.

Prose texts (Prescribed)

- A warmer or a colder earth (popular science) Arthur – C. Clark
- The tiger in the tunnel (narrative) – Ruskin Bond.
- First two or four pages from Sunny Days (autobiographical) – By Sunil Gavaskar
- Case of suspension (narrative)
- Big brother (narrative) Shekhar Joshi
- Father, dear father (newspaper article form the Hindu)
- Face to face (autobiographical) Ved Mehta
- I must know the truth (narrative) Sigrun Srivastva
- If I were you (play) Douglas James
- India, her past and her future (speech) Jawahar Lal Nehru

Poems

- Leisure – W H Davis
- The road not taken – Robert Frost
- Where the mind is without fear- Tagore
- My grandmother's house – Kamla Das
- The night of the scorpion – Nissi, Ezekiel

Non prescribed

In this section learners will be exposed to newspaper, articles, tables, diagrams, advertisements etc. which they have to read carefully and interpret. In the examination similar pieces will be used.

Grammar and usage

The following points of grammar and usage have been selected from the reading passages.

- Agreement /concord: number – gender etc.
- Tenses: simple past (negatives/interrogatives) present perfect, past perfect continuous, past perfect, expressing future time (will and going to)
- Passive voice (perfect tenses and modals)
- Modals (must, should ought to, would)
- Linking words (to like because although, instead of, if, as, since, who, which that, when however, inspite of)
- Reported speech, statements, questions (yes/no)

Module 2: Functional writing and study skills

This module help the learner to write descriptive and narrative paragraph, letters, reports notices etc. and also practice skills of note making

- Paragraph writing
  - Describing objects
  - Describing people
  - Narrating events, stories
- Letter writing
  - Application for leave
  - Application for jobs
  - Asking for information form various agencies (e.g. Last date for getting prospects; price of items before placing doers etc.)
- Note making
- Ending (punctuation, spelling, appropriate vocabulary, structures)

Syllabus to be covered before IA: Module 1

RECOMMENDED BOOKS

1. Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House
2. Business Communications, Varinder Bhatia, Khanna Publishing House

TH.2 APPLIED CHEMISTRY

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

RATIONALE:

Automobiles are the principal mode of transport system. Their manufacture and maintenance gives a major scope for employment. Many entrepreneur pass outs go for servicing of automobiles or trading/ manufacturing of auto components. Thus automobile engineering is an important subject to be in the regular curriculum of the mechanical engineers.

COURSE OBJECTIVES:

At the end of the course the students will be able to:

- Understand automobile chassis, transmission, breaking and fuel system etc.
- Understand the basics of electric vehicle kinematics.
- Understand the concepts of hybrid electric vehicles.

Topic Wise Distribution of Periods

Sl No.	Topic	Periods
1	Structure of Atom	7
2	Periodic Properties of Elements	15
3	Chemical Bonds	10
4	Fuel and their Classification	15
5	Water	10
6	Corrosion	8
7	Plastic and Polymers	15

DETAILED CONTENTS

1.0 Structure of Atom:

- Rutherford model of the structure of atom, Bohr's theory of electrons, quantum numbers and their significance, de-Broglie equation and uncertainty principle, electronic configuration of 1 to 30 elements

2.0 Periodic Properties of Elements:

- Periodic law, periodic table, periodicity in properties like atomic radii and volume, ionic radii, ionization energy and electron affinity, Division of elements into s,p,d and f blocks

3.0 Chemical Bonds:

- Electrovalent, covalent and coordinate bond and their properties, Metallic bonding (electron cloud mode) and properties (like texture, conductance, luster, ductility and malleability).

4.0 Fuel and their Classification:

- Definition, characteristics, classification into solid, liquid and gaseous fuel, Petroleum and brief idea of refining into various factions and their characteristics and uses, Calorific value of fuel, Gaseous fuels- preparation, properties, composition and use of producer gas, water and oil gas.

5.0 Water:

- Impurities in water, methods of their removal, hardness of water, its types, causes and removal, disadvantages of hard water in boilers, pH value and its determination by calorimetric method.

6.0 Corrosion:

- Its meaning, theory of corrosion, prevention of corrosion by various methods using metallic and non-metallic coatings

7.0 Plastic and Polymers:

- Plastic-thermo-plastic and thermo-setting, Introduction of Polythene. P.V.C. Nylon, synthetic rubber and phenol-formal-dehyde resin, their application in industry.

Syllabus covered up to I.A-Chapters 1,2 &3

RECOMMENDED BOOKS

1. Chemistry, Satyaprakash, Khanna Publishing House
2. Engineering Chemistry, Saiful Islam, Khanna Publishing House

TH.3 APPLIED PHYSICS

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

RATIONALE:

Bulk powers used in industries and for domestic purposes are generated in power plants. A large number of diverse and specialized equipment and system are used in a power plant should have this specialized elective course.

COURSE OBJECTIVES:

At the end of the course the students will be able to:

- Understand the generation of power by utilizing various energy sources.
- Understand the use of steam, its operation in steam power plants.
- Understand the nuclear energy sources and power developed in nuclear power plant.
- Understand the basics of gas turbine power plant, diesel engine power plant and hydroelectric power plant.

Topic Wise Distribution of Periods

Sl No.	Topic	Periods
1	Units & Dimensions	7
2	Surface Tension and Viscosity	15
3	Vibrations	12
4	Heat	18
5	Ultrasonic	13
6	Optics	15

DETAILED CONTENTS

1.0 Units & Dimensions:

- M.K.S. fundamentals & derived units, S.I. base units supplementary units and derived units, Dimensions of various physical quantities, uses of dimensional analysis.

2.0 Surface Tension and Viscosity:

- Molecular forces, molecular theory of surface tension, surface energy, capillary action, concept of viscosity, coefficient of viscosity, principle and construction of viscometers.

3.0 Vibrations:

- Vibration as simple spring mass system, elementary and qualitative concept of free and forced vibrations, resonance. Effects of vibrations on building bridges and machines members.

4.0 Heat:

- Temperature and its measurement, thermoelectric, platinum resistance thermometers and pyrometers. Conduction through compound media and laws of radiations.

5.0 Ultrasonic:

- Productions of ultrasonic waves by magnetostriction and piezo-electric effect, application of ultrasonics in industry.

6.0 Optics:

- Nature of light, reflection and refraction of a wave from a plane surface. Overhead projector and Epidiascope.

Syllabus covered up to I.A-Chapters 1,2 &3

RECOMMENDED BOOKS

1. Text Book of +2 Physics – Vol-I & II by Barik, Das & Sharma (Klayani Publishers).
2. Engineering Physics by Gaur & Gupta (Dhanpat Rai & Co., New Delhi)
3. Fundamental of Physics - Halliday, Resnick & Walker (Willey Toppan Publishers)
4. Engineering Physics – B. L. Theraja (S. Chand Publishers, New

TH.4. APPLIED MATHEMATICS – I

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

RATIONALE:

Bulk powers used in industries and for domestic purposes are generated in power plants. A large number of diverse and specialized equipment and system are used in a power plant should have this specialized elective course.

COURSE OBJECTIVES:

At the end of the course the students will be able to:

- Understand the working principle of modern machining processes.
- Understand the Plastic Processing
- Understand the additive manufacturing process
- Understand the Special Purpose Machines
- Understand the Maintenance of Machine Tools

Topic Wise Distribution of Periods

Sl No.	Topic	Periods
1	Sets, Relations and Functions	20
2	Sequences and Series	15
3	Algebra-I	15
4	Co-ordinate Geometry	15
5	Statistics and Probability	15

DETAILED CONTENTS

1.0 Sets, Relations and Functions:

- Sets
- Relations and Functions-I
- Trigonometric Functions-I
- Trigonometric Functions-II
- Relation between Sides and Angles of A triangle

2.0 Sequences and Series:

- Sequences and Series, Some Special Sequences

3.0 Algebra-I:

- Complex Numbers
- Quadratic Equations and Linear inequalities
- Principle of Mathematical Induction
- Permutations and Combinations
- Binomial Theorem

4.0 Co-ordinate Geometry:

- Cartesian System of Rectangular Co-ordinates, Straight Lines, Circles, Conic Sections

5.0 Statistics and Probability:

- Measures of Dispersion
- Random Experiments and Events
- Probability

Syllabus covered up to I.A-Chapters 1,2 &3

RECOMMENDED BOOKS

1. Applied Mathematics-I, J.K. Tyagi, Khanna Publishing House
2. Engineering Mathematics, Reena Garg, Khanna Publishing House

Pr.1. APPLIED CHEMISTRY LAB

Practical	**3 Periods per week**	**Term Work**	**25Marks**
Total Periods	**45 Periods**	**End Sem Exam**	**50Marks**
Examination	**3hours**	**Total Marks**	**75Marks**

COURSE OBJECTIVES

At the end of the course the students will be able to

1. Study the construction features of Domestic Refrigerator, water cooler, Window Air Conditioner, Split Air Conditioner
2. Determining the capacity, COP, of Refrigerator Test Rig, Window air Conditioner, Split Air Conditioner, Water cooler.
3. Evacuating the entire system
4. Locating the leakage in refrigerating system
5. Charging of the refrigerating system

List of Practical Experiments:

1. Proximate analysis of solid fuel.
2. Experiments based on Bomb Calorimeter.
3. Determination of turbidity in a given sample.
4. To determine the flash and fire point of a given lubricating oil.
5. To determine the viscosity of a given lubricating oil by Redwood viscometer.
6. To determine cloud and pour point of a given oil.

Pr 2. APPLIED PHYSICS LAB

Practical	**3 Periods per week**	**Term Work**	**25Marks**
Total Periods	**45 Periods**	**End Sem Exam**	**50Marks**
Examination	**3hours**	**Total Marks**	**75Marks**

COURSE OBJECTIVES

At the end of the course the students will be able to

1.0 Conducting performance test on impulse and reaction turbine

2.0 Conducting performance test on centrifugal pump

3.0 Designing &operating pneumatic circuits

4.0 Designing &operating industrial fluid power circuits

List of Practical Experiments:

1. To determine the surface tension of a liquid by rise in capillary.
2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using a sonometer.
4. To determine the frequency of AC main using sonometer.
5. Time period of a cantilever.

EQUIPMENT LIST

APPLIED CHEMISTRY LAB

SL.NO	NAME OF THE EQUIPMENTS	QUANTITY
01		01 no
02		01 no
03		01 no
04		01 no
05		01 no
06		02 nos
07		02 nos
08		01
09		
10		

APPLIED PHYSICS LAB

SL.NO	NAME OF THE EQUIPMENTS	QUANTITY
01		01no
02		01no
03		01no
04		01no
05		02nos
06		01no
07		05nos
08		
09		
10		