

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:

Data Annotator

(QUALIFICATION PACK: Ref. Id. SSC/Q8120)

SECTOR: IT-ITeS

Grades XI and XII



PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal – 462 002, M.P., India

www.psscive.ac.in

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:

Data Annotator

(QUALIFICATION PACK: Ref. Id. SSC/Q8120)

SECTOR: IT-ITeS

Grades XI and XII



PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal – 462 002, M.P., India
www.psscive.ac.in

LEARNING OUTCOME BASED CURRICULUM

Data Annotator

IT-ITeS Sector

Jul, 2023

© PSSCIVE, 2023

<http://www.psscive.ac.in>

No part of this work may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission from the Publisher, with the exception of any material supplied specifically for the purpose of being used by the purchaser of the work.

The views and opinions expressed in this publication are those of the contributors/ authors and do not necessarily reflect the views and policies of PSS Central Institute of Vocational Education, Bhopal. The PSSCIVE does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use.

Published by:

Joint Director

PSS Central Institute of Vocational Education, NCERT, Shyamla Hills, Bhopal

FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) a constituent of the National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based curricula and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education (CSSVSHSE) launched by the Ministry of Education, Government of India in 2012. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Rashtriya Madhyamik Shiksha Abhiyan (RMSA)*. The main purpose of the competency based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based curriculum as part of the vocational training packages for the job role of **IT-ITeS – Data Annotator**. The curriculum has been developed for the secondary students of vocational education and is aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF).

The curriculum aims to provide children with employability and vocational skills to support occupational mobility and lifelong learning. It will help them to acquire specific occupational skills that meet employers' immediate needs. The teaching process is to be performed through the interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences.

The curriculum has been developed and reviewed by a group of experts and their contributions are greatly acknowledged. The utility of the curriculum will be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further improvement in this document.

Dinesh Prasad Saklani
Director
National Council of Educational Research & Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth are immense and the possibilities are equally exciting. The world is looking at us to deliver sustainable growth and progress. To meet the growing expectations, India will largely depend upon its young workforce. The much-discussed demographic dividend will bring sustaining benefits only if this young workforce is skilled and its potential is channelized in the right direction.

In order to fulfill the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Education (MoE), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop learning outcome based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation need to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfill the needs of the society and the world of work. In order to honor its commitment to the nation, the PSSCIVE has initiated the work on developing learning outcome based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and course-ware for over 100 job roles in various sectors.

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum. We are grateful to MoE and NCERT for the financial support and cooperation in realising the objective of providing learning outcome based modular curricula and course-ware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of MoE.

Finally, for transforming the proposed curriculum design into a vibrant reality of implementation, all the institutions involved in the delivery system shall have to come together with a firm commitment and they should secure optimal community support. The success of this curriculum depends upon its effective implementation and it is expected that the managers of vocational education and training system, including subject teachers will make efforts to create better facilities, develop linkages with the world of work and foster a conducive environment as per the content of the curriculum document.

The PSSCIVE, Bhopal remains committed in bringing about reforms in the vocational education and training system through the learner-centric curricula and course-ware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st Century.

Deepak Paliwal
Joint Director

PSS Central Institute of Vocational Education

ACKNOWLEDGMENT

On behalf of the team at the PSS Central Institute of Vocational Education (PSSCIVE) we are grateful to the members of the Project Approval Board (PAB) of Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and the officials of the Ministry of Education (MoE), Government of India for the financial support to the project for development of curricula.

We are grateful to the Director, NCERT for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of RMSA, MoE, RMSA Cell at the National Council of Educational Research and Training (NCERT), National Skill Development Agency (NSDA) and National Skill Development Corporation (NSDC) and Electronics Sector Skill Council of India (ESSCI) for their academic support and cooperation.

We are grateful to the expert contributors and Deepak D. Shudhalwar, Professor (CSE), PSSCIVE, for their earnest effort and contributions in the development of this learning outcome based curriculum. Their contributions are dully acknowledged.

The contributions made by Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC), Vipin Kumar Jain, Associate Professor and Head, Programme Planning and Monitoring Cell (PPMC) and Deepak Shudhalwar, Professor (CSE) and Head, ICT and Computer Centre, PSSCIVE in development of the curriculum for the employability skills are duly acknowledged.

We are also grateful to the Course Coordinator Deepak D. Shudhalwar, Professor (CSE), Head, ICT and Computer Centre, Department of Engineering and Technology, PSSCIVE, for bringing out this curriculum in the final form.

PSSCIVE Team

CONTENTS

Sn.	Title		Page No.
	Foreword		i
	Preface		ii
	Acknowledgment		iii
1	Course Overview		1
2	Scheme of Units and Assessment		2
3	Teaching/ Training Activities		4
4	Assessment and Certification		4
5	Unit Content	Grade XI	7
	Part A	Employability Skills	7
	Unit 1	Communication Skills – III	7
	Unit 2	Self-management Skills – III	9
	Unit 3	Basic ICT Skills – III	10
	Unit 4	Entrepreneurial Skills – III	11
	Unit 5	Green Skills – III	12
	Part B	Vocational Skills	13
	Unit 1	Basics of Data Annotation	13
	Unit 2	Data Curation and Labelling	15
	Unit 3	Manage and Plan Work Requirements	16
		Class XII	17
	Part A	Employability Skills	17
	Unit 1	Communication Skills – IV	17
	Unit 2	Self-management Skills – IV	18
	Unit 3	Basic ICT Skills – IV	19
	Unit 4	Entrepreneurial Skills – IV	20
	Unit 5	Green Skills – IV	21
	Part B	Vocational Skills	22
	Unit 1	Data Quality Management	22
	Unit 2	Documentation	23
	Unit 3	Workplace Data Management	24
	Unit 4	Inclusive and Environmentally Sustainable Workplaces	25
6	Organization of Field Visits and OJT		26
7	List of Equipment and Materials		26
8	Teacher's Qualification		27
9	List of Contributors		29

1. COURSE OVERVIEW

Course Title: Data Annotator

Data annotation is the process of labeling elements of training data, that may be text, images, audio, or video to help machines understand what exactly is in it and what is important, so that machines can use it. It is especially useful for supervised machine learning (ML), where the system relies on labeled datasets to process, understand, and learn from input patterns to arrive at desired outputs. An annotation might look like highlighting information or vocabulary in a text, marking a text with symbols to represent different ideas, creating notes in the margins of a text to keep track of thoughts and questions, or writing summaries at the end of a chapter or section for easy review. Data annotation has applications in diverse sectors ranging from chatbot companies, finance, medicine to government and space programs.

Individuals at this job are responsible for data entry and being able to classify the data they are provided with. They are responsible for extracting data from scientific literature using controlled vocabularies. They assess the information from various sources like videos, advertisements, photographs, and other types of material and then attach tags to the content. Data Annotator is required to inculcate strong work ethic, maintain a healthy working environment, and provide data and information in standard formats.

COURSE OUTCOMES: On completion of the course, students should be able to:

- ✓ Apply effective oral and written communication skills to interact with customers;
- ✓ Identify the principal components of a computer system;
- ✓ Demonstrate the basic skills of using computer;
- ✓ Demonstrate self-management skills;
- ✓ Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills;
- ✓ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ Explain the basic concepts of data annotation;
- ✓ Describe various uses cases of data annotation;
- ✓ Evaluate and identify different types of data and data annotation techniques;
- ✓ Evaluate, analyse, and classify various elements of datasets as per the defined terms/keywords;
- ✓ Outline various annotation methods and tools to carryout data annotation process;
- ✓ Evaluate various process, methods and standards that can be implemented to improve data efficiency and quality;
- ✓ Employ proper classification and storage of raw and annotated data to avoid misclassification and maintain data security;
- ✓ Employ various methods to evaluate the accuracy of annotated data;
- ✓ Prepare documentation and reports as per the standard templates;
- ✓ Describe the standard formats to manage data/information effectively;
- ✓ Illustrate sustainable practices at workplace for energy efficiency and waste management;
- ✓ Apply different approaches to maintain gender equality and increase inclusiveness.

COURSE REQUIREMENTS: The learner should have basic knowledge of science.

COURSE LEVEL: This course can be taken up at Intermediate level in Grade XI and Grade XII.

COURSE DURATION: Total : 600 hours

Grade 11 : 300 hours

Grade 12 : 300 hours

2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Grade XI and XII opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for **Grade XI** is as follows :

GRADE XI			
	Units	No. of Hours for Theory and Practical 300	Max. Marks for Theory & Practical 100
Part A	Employability Skills		
Unit 1	Communication Skills – III	20	10
Unit 2	Self-management Skills – III	15	
Unit 3	Basic ICT Skills – III	20	
Unit 4	Entrepreneurial Skills – III	20	
Unit 5	Green Skills – III	15	
	Total Hours	90	10
Part B	Vocational Skills		
Unit 1	Basics of Data Annotation	45	40
Unit 2	Data Curation and Labelling	90	
Unit 3	Manage and Plan Work Requirements	15	
	Total Hours	150	40
Part C	Field Visits (3x5)	15	10
Part D	On the Job Training and Field Visits (3x5)	45	
Part E	Project/ Practical Work		
	Practical File/ Student Portfolio		10
	Practical Work		10
	Written Test		10
	Viva Voce		10
	Total		60
	Total Hours	300	100

The unit-wise distribution of hours and marks for **Grade XII** is as follows:

GRADE XII			
	Units	No. of Hours for Theory and Practical 300	Max. Marks for Theory & Practical 100
Part A	Employability Skills		
Unit 1	Communication Skills – III	20	10
Unit 2	Self-management Skills – III	15	
Unit 3	Basic ICT Skills – III	20	
Unit 4	Entrepreneurial Skills – III	20	
Unit 5	Green Skills – III	15	
	Total Hours	90	10
Part B	Vocational Skills		
Unit 1	Data Quality Management	75	40
Unit 2	Documentation	30	
Unit 3	Workplace Data Management	30	
Unit 4	Inclusive and Environmentally Sustainable Workplaces	15	
	Total Hours	150	40
Part C	Field Visits (3x5)	15	10
Part D	On the Job Training and Field Visits (3x5)	45	
Part E	Project/ Practical Work		
	Practical File/ Student Portfolio		10
	Practical Work		10
	Written Test		10
	Viva Voce		10
	Total		60
	Total Hours	300	100

3. TEACHING/TRAINING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace.

Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

Practical work may include but not limited to hands-on-training, simulated training, role play, case based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the vocational teacher to the Head of the Institution.

FIELD VISITS/ EDUCATIONAL TOUR

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Vocational Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least three field visits should be conducted in a year.

4. ASSESSMENT AND CERTIFICATION

Upon successful completion of the course by the candidate, the Central/ State Examination Board for Secondary Education and the respective Sector Skill Council will certify the competencies.

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOSs), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know the competencies acquired through the vocational subject or course. The assessment should be reliable, valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

KNOWLEDGE ASSESSMENT (THEORY)

Knowledge Assessment should include two components: one comprising of internal assessment and second an external examination, including theory examination to be conducted by the Board. The assessment tools shall contain components for testing the knowledge and application of knowledge. The knowledge test can be objective paper based test or short structured questions based on the content of the curriculum.

WRITTEN TEST

It allows candidates to demonstrate that they have the knowledge and understanding of a given topic. Theory question paper for the vocational subject should be prepared by the subject experts comprising group of experts of academicians, experts from existing vocational subject experts/teachers, and subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

The blue print for the question paper may be as follows:

Duration: 3 hrs
30

Max. Mark:

	Typology of Question	No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	3	2	2	13
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	2	3	2	14
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	2	1	07
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	2	0	04
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	Total	5x1=5	10x2=20	5x3=15	40 (20 Qes.)

SKILL ASSESSMENT (PRACTICAL)

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, using a competency checklist. The competency

checklist should be developed as per the National Occupation Standards (NOSs) given in the Qualification Pack for the Job Role to bring about necessary consistency in the quality of assessment across different sectors and Institutions. The student has to demonstrate competency against the performance criteria defined in the National Occupation Standards and the assessment will indicate that they are 'competent', or are 'not yet competent'. The assessors assessing the skills of the students should possess a current experience in the industry and should have undergone an effective training in assessment principles and practices. The Sector Skill Councils should ensure that the assessors are provided with the training on the assessment of competencies.

Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators – the subject teacher and the expert from the relevant industry certified by the Board or concerned Sector Skill Council. The same team of examiners will conduct the viva voce.

Project Work (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organised as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

Student Portfolio is a compilation of documents that supports the candidate's claim of competence. Documents may include reports, articles, photos of products prepared by students in relation to the unit of competency.

Viva voce allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted as per the specific requirements of the vocational subject. Viva voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

CONTINUOUS AND COMPREHENSIVE EVALUATION

Continuous and Comprehensive Evaluation (CCE) refers to a system of school-based evaluation of students that covers all aspects of student's development. In this scheme, the term 'continuous' is meant to emphasize that evaluation of identified aspects of students 'growth and development' is a continuous process rather than an event, built into the total teaching-learning process and spread over the entire span of academic session. The second term 'comprehensive' means that the scheme attempts to cover both the scholastic and the co-scholastic aspects of students' growth and development. For details, the CCE manual of Central Board of Secondary Education (CBSE) or the guidelines issued by the State Boards on the procedure for CCE should be followed by the Institutions.

5. UNIT CONTENTS

GRADE XI, Part A: Employability Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Communication Skills – III	20
Unit 2	Self-management Skills – III	15
Unit 3	Basic ICT Skills – III	20
Unit 4	Entrepreneurial Skills – III	20
Unit 5	Green Skills – III	15
Total		90

Unit 1: Communication Skills – III

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1	Demonstrate knowledge of communication	<ul style="list-style-type: none"> • Introduction to communication • Importance of communication • Elements of communication • Perspectives in communication • Effective communication 	<ul style="list-style-type: none"> • Role-play on the communication process • Group discussion on the importance of communication and factors affecting perspectives in communication • Charts preparation on elements of communication • Classroom discussion on the 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete) for effective communication 	03
2	Demonstrate verbal communication	<ul style="list-style-type: none"> • Verbal communication • Public Speaking 	<ul style="list-style-type: none"> • Role play of a phone conversation • Group activity on delivering a speech and practicing public speaking 	02
3	Demonstrate non-verbal communication	<ul style="list-style-type: none"> • Importance of non-verbal communication, • Types of non-verbal communication, • Visual communication 	<ul style="list-style-type: none"> • Role plays on non-verbal communication • Group exercise and discussion on Do's and Don'ts to avoid body language mistakes • Group activity on methods of communication 	02
4	Demonstrate speech using correct	<ul style="list-style-type: none"> • Pronunciation basics, • Speaking properly, • Phonetics, 	<ul style="list-style-type: none"> • Group activities on practicing pronunciation 	01

	pronunciation	<ul style="list-style-type: none"> Types of sounds 		
5	Apply an assertive communication style	<ul style="list-style-type: none"> Important communication styles, Assertive communication, Advantages of assertive communication, Practicing assertive communication 	<ul style="list-style-type: none"> Group discussion on communication styles, Group discussion on observing and sharing communication styles 	02
6	Demonstrate the knowledge of saying no	<ul style="list-style-type: none"> Steps for saying "No" Connecting words 	<ul style="list-style-type: none"> Group discussion on how to say 'No' 	01
7	Identify and use parts of speech in writing	<ul style="list-style-type: none"> Capitalisation, Punctuation, Basic parts of speech, Supporting parts of speech 	<ul style="list-style-type: none"> Group activity on identifying parts of speech, Writing a paragraph with punctuation marks, Group activity on constructing sentences, Group activity on identifying parts of speech 	02
8	Write correct sentences and paragraphs	<ul style="list-style-type: none"> Parts of a sentence Types of object Types of sentences Paragraph 	<ul style="list-style-type: none"> Activity on framing sentences Activity on active and passive voice Assignment on writing different types of sentences. 	01
9	Communicate with people	<ul style="list-style-type: none"> Geetings, Introducing self and others 	<ul style="list-style-type: none"> Role-play on formal and informal greetings, Role-play on introducing someone, Practice and group discussion on how to greet different people 	01
10	Introduce yourself to others and write about oneself	<ul style="list-style-type: none"> Talking about self Filling a form 	<ul style="list-style-type: none"> Practicing self-introduction and filling up forms Practicing self-introduction to others 	01
11	Develop questioning skill	<ul style="list-style-type: none"> Main types of questions, Forming closed and open ended questions 	<ul style="list-style-type: none"> Practice exercise on forming questions, Group activity on framing questions. 	01
12	Communicate information about family to others	<ul style="list-style-type: none"> Names of relatives, Relations 	<ul style="list-style-type: none"> Practice taking about family, Role-ply on talking about family members 	01
13	Describe habits and routines	<ul style="list-style-type: none"> Concept of habits and routines 	<ul style="list-style-type: none"> Group discussion on habits and routines Group activity on describing 	01

			routines	
14	Ask or give directions to others	<ul style="list-style-type: none"> Asking for directions, Using landmarks 	<ul style="list-style-type: none"> Role-play on asking and giving directions, Identifying symbols used for giving directions 	01
			Total Duration in Hours	20

Unit 2: Self-management Skills – III

Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	15
1.	Identify and analyze own strengths and weaknesses	<ul style="list-style-type: none"> Understanding self Techniques for identifying strengths and weaknesses Difference between interests and abilities 	<ul style="list-style-type: none"> Activity on writing aims in life Prepare a worksheet on interests and abilities 	02
2.	Demonstrate personal grooming skills	<ul style="list-style-type: none"> Guidelines for dressing and grooming Preparing a personal grooming checklist 	<ul style="list-style-type: none"> Role-play on dressing and grooming standards Self-reflection activity on various aspects of personal grooming 	02
3.	Maintain personal hygiene	<ul style="list-style-type: none"> Importance of personal hygiene Three steps to personal hygiene Essential steps of hand washing 	<ul style="list-style-type: none"> Role-play on personal hygiene Assignment on personal hygiene 	02
4.	Demonstrate the knowledge of working in a team and participating in group activities	<ul style="list-style-type: none"> Describe the benefits of teamwork, Working in a team 	<ul style="list-style-type: none"> Assignment on working in a team, Self-reflection on teamwork 	02
5	Develop networking skills	<ul style="list-style-type: none"> Benefits of networking skills, Steps to build networking skills 	<ul style="list-style-type: none"> Group activity on networking in action, Assignment on networking skills 	01
6	Describe the meaning and importance of self-motivation	<ul style="list-style-type: none"> Meaning of self-motivation, Types of motivation, Steps to building self-motivation 	<ul style="list-style-type: none"> Activity on staying motivated, Assignment on reasons hindering motivation 	02
7	Set goals	<ul style="list-style-type: none"> Meaning of goals and purpose of goal-setting, Setting SMART goals 	<ul style="list-style-type: none"> Assignment on setting SMART goals, Activity on developing long-term and short-term goals using SMART method 	02
8	Apply time management strategies and techniques	<ul style="list-style-type: none"> Meaning and importance of time management, Steps for effective time management 	<ul style="list-style-type: none"> Preparing checklist of daily activities 	02
			Total Duration in Hours	15

Unit 3: Information and Communication Technology Skills – III

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1.	Create a document on the word processor	<ul style="list-style-type: none"> • Introduction to ICT, • Advantages of using a word processor, • Work with LibreOffice Writer 	<ul style="list-style-type: none"> • Demonstration and practice of the following: • Creating a new document • Typing text • Saving the text • Opening and saving file in Microsoft word/Libre Office Writer 	02
2.	Identify icons on the toolbar	<ul style="list-style-type: none"> • Status bar, • Menu bar, • Icons on the Menu bar, • Multiple ways to perform a function 	<ul style="list-style-type: none"> • Group activity on using basic user interface of LibreOffice writer • Group activity on working with Microsoft Word 	02
3.	Save, close, open and print document	<ul style="list-style-type: none"> • Save a document, • Close a document, • Open an existing document, • Print a document 	<ul style="list-style-type: none"> • Group activity on performing the functions for saving, closing and printing documents in LibreOffice Writer, • Group activity on performing the functions to save, close and print documents 	02
4.	Format text in a document	<ul style="list-style-type: none"> • Change style and size of text • Align text, • Cut, Copy, Paste, • Find and replace 	<ul style="list-style-type: none"> • Group activity on formatting text in LibreOffice Writer, • Group activity on formatting text in Microsoft Word 	02
5.	Check spelling and grammar in a word document	<ul style="list-style-type: none"> • Use of spell checker, • Autocorrect 	<ul style="list-style-type: none"> • Group activity on checking spellings and grammar using LibreOffice Writer • Group activity on checking spellings and grammar using Microsoft Word 	02
6.	Insert lists, tables, pictures, and shapes in a word document	<ul style="list-style-type: none"> • Insert bullet list, • Number list, • Tables, • Pictures, • Shapes 	<ul style="list-style-type: none"> • Practical exercise of inserting lists and tables using LibreOffice Writer 	03
7.	Insert header, footer and page number in a word document	<ul style="list-style-type: none"> • Insert header, • Insert footer, • Insert page number, • Page count 	<ul style="list-style-type: none"> • Practical exercise of inserting header, footer and page numbers in LibreOffice Writer • Practical exercise of inserting header, footer and page numbers in Microsoft Word 	03
8.	Make changes by using the track	<ul style="list-style-type: none"> • Tracking option • Manage option 	<ul style="list-style-type: none"> • Group activity on performing track changes in LibreOffice 	04

	change option in a word document	<ul style="list-style-type: none"> • Compare documents 	Writer <ul style="list-style-type: none"> • Group activity on performing track changes in Microsoft Word 	
			Total Duration in Hours	15

Unit 4: Entrepreneurial Skills – III

Sn	Learning Outcome	Theory (07 Hours)	Practical (13 Hours)	20
1.	Differentiate between different kinds of businesses	<ul style="list-style-type: none"> • Introduction to entrepreneurship • Types of business activities 	<ul style="list-style-type: none"> • Role play on different kind of business around us 	02
2.	Describe the significance of entrepreneurial values	<ul style="list-style-type: none"> • Meaning of value, • Values of an Entrepreneur, • Case study on qualities of an entrepreneur 	<ul style="list-style-type: none"> • Role play on qualities of an Entrepreneur 	02
3.	Demonstrate the attitudinal changes required to become an entrepreneur	<ul style="list-style-type: none"> • Difference between the attitude of entrepreneur and employee 	<ul style="list-style-type: none"> • Interviewing employees and entrepreneurs 	02
4.	Develop thinking skills like an entrepreneur	<ul style="list-style-type: none"> • Problems of entrepreneurs • Problem-solving, • Ways to think like an entrepreneur 	<ul style="list-style-type: none"> • Group activity on identifying and solving problems 	03
5.	Generate business ideas	<ul style="list-style-type: none"> • The business cycle, • Principles of idea creation, • Generating a business idea, • Case studies 	<ul style="list-style-type: none"> • Brainstorming on generating a business ideas 	03
6.	Describe customer needs and importance of conducting a customer survey	<ul style="list-style-type: none"> • Understanding customer needs • Conducting a customer survey 	<ul style="list-style-type: none"> • Group activity to conduct a customer survey 	04
7.	Create a business plan	<ul style="list-style-type: none"> • Importance of business planning, • Preparing a business plan, • Principles to follow for growing a business, • Case studies 	<ul style="list-style-type: none"> • Group activity on developing a business plan 	04
			Total Duration in Hours	20

Unit 5: Green Skills – III

Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	15
1.	Describe the importance of the main sector of the green economy	<ul style="list-style-type: none"> • Meaning of ecosystem, food chain and sustainable development • Main sectors of the green economy- E-waste management, green transportation, renewal energy, green construction, and water management 	<ul style="list-style-type: none"> • Group discussion on sectors of green economy, • Poster making on various sectors for promoting green economy 	06
2.	Describe the main recommendations of policies for the green economy	<ul style="list-style-type: none"> • Policies for a green economy 	<ul style="list-style-type: none"> • Group discussion on initiatives for promoting the green economy, • Writing an essay or a short note on the important initiatives for promoting green economy. 	03
3.	Describe the major green sector/area and the role of various stakeholders in the green economy	<ul style="list-style-type: none"> • Stakeholders in the green economy 	<ul style="list-style-type: none"> • Group discussion on the role of stakeholders in green economy • Preparation of posters on green sectors and their stakeholders • Making solar bulbs. 	03
4.	Identify the role of government and private agencies in the green economy	<ul style="list-style-type: none"> • Role of the government in promoting a green economy, • Role of private agencies in promoting green economy 	<ul style="list-style-type: none"> • Group discussion on the role of Government and Private Agencies in promoting a green economy. • Posters making on green sectors. 	03
			Total Duration in Hours	15

GRADE XI, Part B: Vocational Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Basics of Data Annotation	45
Unit 2	Data Curation and Labelling	90
Unit 3	Manage and Plan Work Requirements	15
	Total Duration	150

Unit 1: Basics of Data Annotation

Sn	Learning Outcome	Theory (20 Hours)	Practical (25 Hours)	45
1.	Describe the Machine Learning	<ul style="list-style-type: none"> • Introduction to Artificial Intelligence (AI) and Machine Learning, • Phases of Machine Learning, • Types of Machine Learning – Supervised Learning, Unsupervised Learning, Semi Supervised Learning, Reinforcement Learning • Types of Supervised and Unsupervised Learning Algorithms, • Advantages and disadvantages of Supervised and Unsupervised Learning, • Semi-Supervised Learning, • Applications of Semi-supervised Learning, • Reinforcement Learning, • Applications of Reinforcement Learning, • Training and testing in Machine Learning. 	<ul style="list-style-type: none"> • List the phases of Machine Learning, • Illustrate to train the machine with data, • List the types of learning methods, • Illustrate the types of Supervised Learning Algorithms, • List the types of clustering, • List the disadvantages of Unsupervised Learning, • Illustrate the methodology of Semi-Supervised Learning, • List the applications of Semi-supervised Learning, • List the applications of Reinforcement Learning, • List the real time applications applying the Reinforcement Learning 	10
2.	Describe the Data Annotation for Business	<ul style="list-style-type: none"> • Concept of Data Annotation, • Importance of Data Annotation in Business, • Impact of Data Annotation in Business, • Applications of Data Annotation, • Examples of Data Annotation in Business 	<ul style="list-style-type: none"> • Illustrate the concept of Data Annotation on paper, • List the importance of Data Annotation in Business, • List the applications of Data Annotation, • Illustrate the examples showing the Impact of Data Annotation in Business 	05
3.	Describe the	<ul style="list-style-type: none"> • Define use-cases of Data 	<ul style="list-style-type: none"> • Identify Use cases of Data 	10

	various uses cases and applications of Data Annotation	<p>Annotation – Search Engine Efficiency, Development of facial recognition software, Production of data for automated vehicles, Medical breakthroughs,</p> <ul style="list-style-type: none"> • Applications of Data Annotation – Unmanned Vehicles, Manufacturing, Healthcare, Insurance and Banking, Agriculture, Retail, Animal management, Geosensing, Crop health surveillance, Surveillance and Protection, Insurance, Robotics, Analytics in sports, Image Analysis, Fashion Industry, Shop automation, 	<p>Annotation,</p> <ul style="list-style-type: none"> • Explore the Use cases of Data Annotation, • List the various applications of Data Annotation 	
4.	Describe the Types, Methods and Data Types of Data Annotation	<ul style="list-style-type: none"> • Understanding of Data Annotation Types - Bounding boxes, Lines and splines, Semantic segmentation, 3D cuboids, Polygonal segmentation, Landmark and key-point, Entity annotation • Data Annotation Methods, • Manual Data Annotation, • Data Annotation using Crowd Sourcing, • Data Annotation based on the usage, • Data-Driven Data Annotation, • Data Annotation Using an Artificial Intelligence API • Data Types of Data Annotation – Text Annotation, Audio Annotation, Video Annotation 	<ul style="list-style-type: none"> • List the types of Data Annotation, • Prepare the spreadsheets to conduct analysis & organize data types for annotations, • List the Methods of Data Annotation, • Demonstrate the difference between various annotation methods and techniques based on the project requirements and datasets, • Demonstrate the Text Annotation, Image Annotation, Audio Annotation • Demonstrate Data Analysis using Annotation, • Identify various terms/keywords used in various annotations. 	10
5.	Describe the Tools of Data Annotation	<ul style="list-style-type: none"> • Understanding of Tools of Data Annotation – Colabler, Labelbox, • Open-Source tools – CVAT, VoTT, VGG Image Annotator, LabelMe, DataTurks, Diffgram, VGG Image Annotator, • Documentation Annotation Tools, 	<ul style="list-style-type: none"> • List the tools of Data Annotation, • List the Open-Source tools of Data Annotation, • Illustrate the Annotation using Word, • Illustrate the Annotation using Adobe, • List the General Principles and standards of Data 	10

	<ul style="list-style-type: none"> • Annotation using Word, • Annotation using Adobe, • Data Management Standards – General Principles and standards, • Standards for Data Quality 	<ul style="list-style-type: none"> • Management, • List the standards for Data Quality 	
			Total Duration in Hours 45

Unit 2: Data Curation and Labelling

Sn	Learning Outcome	Theory (30 Hours)	Practical (60 Hours)	90
1.	Describe the Data Curation	<ul style="list-style-type: none"> • Concept of Data Curation, • Define Data Curation in Machine Learning, • Stages of Data Curation • Data Curation characteristics, • Data Curation activities, • Tools of Data Curation, • Real-world applications of Data curation, • Importance of various stakeholders and teams in defining the project goals, • Role of stakeholders as a group 	<ul style="list-style-type: none"> • Prepare the annotated database as per the defined keywords using the existing data, • Demonstrate to identify various data sources using defined keywords. 	15
2.	Evaluate the business needs for Data Annotation	<ul style="list-style-type: none"> • Purpose of Data Annotation, • Benefits of Data Annotation, • Need for Data Annotation services in Business, • Specialized Data Annotation for certain sectors, • Demand for Data Annotation, • The data-driven sector is taken over by predictive annotation, • Annotating data in AI development. 	<ul style="list-style-type: none"> • Analyze domain vocabulary and the properties of the data intended to be used, • Apply relevant annotation methods based on the nature of the project. 	15
3.	Examine the different types of data available for the data curation process	<ul style="list-style-type: none"> • Different types of data for Data Curation process – Text, Image, Audio, Video, Signals, • Data related to scientific, measurements, sales, healthcare, Education. 	<ul style="list-style-type: none"> • Demonstrate to analysis, categorization, and annotation of data elements into named entities, intents, sentiments, and semantics. • Carry out careful organization and handling of annotated data as per the standards in the defined format/ template. 	15
4.	Identify the various	<ul style="list-style-type: none"> • Various sources of data sets, 	<ul style="list-style-type: none"> • Demonstrate to identify various 	10

Curriculum: Data Annotator, Grade XI-XII

	sources of data sets from the annotated database	<ul style="list-style-type: none"> • Sample datasets, • Keyword extraction, • Tools for keyword extraction, 	data sources using defined keywords, <ul style="list-style-type: none"> • List the tools for keyword extraction, • Illustrate to extract the keyword, 	
5.	Examine the data to be annotated is free from any error, missing values	<ul style="list-style-type: none"> • Data errors in annotation, • Misabeled Data, • Inaccurate Labels, • Inaccuracy in Naming Procedure, • Missing Label, • Object Annotation Errors 	<ul style="list-style-type: none"> • Identify various data errors in data annotation, • Identify missing label, • Identify object annotation errors 	10
6.	Assess various data sensitivities issues for sensitive, encrypted, masked data	<ul style="list-style-type: none"> • Data annotation challenges on sensitive, disguised, and encrypted data, • Handling Anonymous or masked data, • Methods to protect sensitive data, • Store only IDs to reconstruct sensitive data, • Privacy policy and obtain full client consent, • Remove sensitive data that is unimportant to the model, • Developing a protocol for private information. 	<ul style="list-style-type: none"> • Identify the various data annotation challenges, • Demonstrate the methods to protect sensitive data, • Demonstrate to remove sensitive data that is unimportant to the model. 	15
7.	Evaluate various data annotation methods and tools	<ul style="list-style-type: none"> • Web annotation data model and its specification, • Image annotation methods, • Data annotation tools and their business purposes, • Genealogical data annotation, • Open-source tools. 	<ul style="list-style-type: none"> • List the various web annotation data model, • Analyze image annotation methods, • List the data annotation tools and their business purposes. 	10
Total Duration in Hours				90

Unit 3: Manage and Plan Work Requirements

Sn	Learning Outcome	Theory (05 Hours)	Practical (10 Hours)	15
1	Define the scope of work	<ul style="list-style-type: none"> • Roles, responsibilities and limits of the responsibilities in work environment, • Importance of gathering detailed work requirements and prioritizing work areas • Annotation Guidelines 	<ul style="list-style-type: none"> • List the needs, requirements, and dependencies in order to meet the work requirements, • List the Importance of work requirements and prioritizing work areas, • Demonstrate to apply resource 	05

			management principles and techniques	
2	Describe the effective work planning principles	<ul style="list-style-type: none"> Assess quality, Annotation redundancy, Process of annotation, Workforce and annotation tool, Attainable goals for quality, timeliness, and productivity, Quality assurance procedure 	<ul style="list-style-type: none"> Demonstrate the ways to maintain an organized work area, Demonstrate the process of annotation and quality assurance. 	05
3	Recognize the importance of using time and resources effectively	<ul style="list-style-type: none"> Work accuracy in annotation, Intended use of annotations, Workforce type and options, Constraints on workforce selection data privacy Annotation tool, Data privacy and access. 	<ul style="list-style-type: none"> Illustrate to apply effective time management principles, Identify anomalies and data drift 	05
			Total Duration in Hours	15

GRADE XII, Part A: Employability Skills

Unit No.	Unit Name	Duration (Hrs.)
Unit 1	Communication Skills – IV	20
Unit 2	Self-management Skills – IV	15
Unit 3	Basic ICT Skills – IV	20
Unit 4	Entrepreneurial Skills – IV	20
Unit 5	Green Skills – IV	15
	Total Hours	90

Unit 1: Communication Skills – IV

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1.	Demonstrate active listening skills	<ul style="list-style-type: none"> Active listening -listening skill, stages of active listening, Overcoming barriers to active listening 	<ul style="list-style-type: none"> Group discussion on the factors affecting active listening, Preparing posters of steps for active listening, Role-play on negative effects of not listening actively 	07
2.	Identify the parts of speech	<ul style="list-style-type: none"> Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech 	<ul style="list-style-type: none"> Group practice on identifying parts of speech Group practice on constructing sentences 	07
3.	Write sentences	<ul style="list-style-type: none"> Writing skills to practice the 	<ul style="list-style-type: none"> Group activity on writing 	06

		following: <ul style="list-style-type: none"> • Simple sentence • Complex sentence • Types of object • Identify the types of sentences <ul style="list-style-type: none"> • Active and Passive sentences • Statement/Declarative sentence • Question/Interrogative sentence • Emotion/Reaction or Exclamatory sentence • Order or Imperative sentence 	sentences and paragraphs, <ul style="list-style-type: none"> • Group activity on practicing writing sentences in active or passive voice, • Group activity on writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative) 	
			Total Duration in Hours	20

Unit 2: Self-management Skills – IV

Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	15
1.	Describe the various factors influencing motivation and positive attitude	<ul style="list-style-type: none"> • Motivation and positive attitude • Intrinsic and extrinsic motivation • Positive attitude – ways to maintain positive attitude • Stress and stress management - ways to manage stress 	<ul style="list-style-type: none"> • Role Play on avoiding stressful situation, • Activity on listing negative situations and ways to turn it positive 	06
2.	Describe how to become result oriented	<ul style="list-style-type: none"> • How to become result oriented, • Goal setting – examples of result-oriented goals 	<ul style="list-style-type: none"> • Pair and share activities on the aim of life 	03
3.	Describe the importance of self-awareness and the basic personality traits, types and disorders	<ul style="list-style-type: none"> • Steps towards self-awareness • Personality and basic personality traits • Common personality disorders- <ul style="list-style-type: none"> • Suspicious • Emotional and impulsive • Anxious • Steps to overcome personality disorders 	<ul style="list-style-type: none"> • Group discussion on self awareness • Group discussion on common personality disorders • Brainstorming steps to overcome personality disorder 	06
			Total Duration in Hours	15

Unit 3: Information and Communication Technology Skills – IV

Sn	Learning Outcome	Theory (06 Hours)	Practical (14 Hours)	20
1.	Identify the components of a spreadsheet application	<ul style="list-style-type: none"> Getting started with spreadsheet – types of a spreadsheet, components of a worksheet, Starting LibreOffice Calc Creating a worksheet 	<ul style="list-style-type: none"> Group activity on identifying components of spreadsheet in LibreOffice Calc 	02
2.	Perform basic operations in a spreadsheet	<ul style="list-style-type: none"> Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell Selecting multiple cells Saving the spreadsheet in various formats Closing the spreadsheet Opening the spreadsheet. Printing the spreadsheet. 	<ul style="list-style-type: none"> Group activity on working with data on LibreOffice Calc 	03
3.	Demonstrate the knowledge of working with data and formatting text	<ul style="list-style-type: none"> Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula Need to format cell and content, Changing text style and font size, Align text in a cell, Highlight text. 	<ul style="list-style-type: none"> Group activity on formatting a spreadsheet in LibreOffice Calc Group activity on performing basic calculations in LibreOffice Calc. 	02
4.	Demonstrate the knowledge of using advanced features in spreadsheet	<ul style="list-style-type: none"> Sorting data, Filtering data, Protecting spreadsheet with password 	<ul style="list-style-type: none"> Group activity on sorting data in LibreOffice Calc 	03
5.	Make use of the software used for making slide presentations	<ul style="list-style-type: none"> Available presentation software Steps to start LibreOffice Impress Adding text to a presentation 	<ul style="list-style-type: none"> Group practice on working with LibreOffice Impress tools, Group practice on creating a presentation in LibreOffice Impress 	02
6.	Demonstrate the knowledge to open, close and save slide presentations	<ul style="list-style-type: none"> Open, Close, Save and Print a slide presentation 	<ul style="list-style-type: none"> Group activity on saving, closing and opening a presentation in LibreOffice Impress 	01

Curriculum: Data Annotator, Grade XI-XII

7.	Demonstrate the operations related to slides and texts in the presentation	<ul style="list-style-type: none"> Working with slides and text in a presentation- adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning text, changing text colour 	<ul style="list-style-type: none"> Group practice on working with font styles and types in LibreOffice Impress 	04
8.	Demonstrate the use of advanced features in a presentation	<ul style="list-style-type: none"> Advanced features used in a presentation, Inserting shapes in the presentation, Inserting clipart and images in a presentation, Changing slide layout 	<ul style="list-style-type: none"> Group activity on changing slide layout on LibreOffice Impress 	03
Total Duration in Hours				20

Unit 4: Entrepreneurial Skills – IV

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1.	Describe the concept of entrepreneurship and the types and roles and functions entrepreneur	<ul style="list-style-type: none"> Entrepreneurship and entrepreneur Characteristics of entrepreneurship Entrepreneurship-art and science Qualities of a successful entrepreneur Types of entrepreneurs Roles and functions of an entrepreneur What motivates an entrepreneur Identifying opportunities and risk-taking Startups 	<ul style="list-style-type: none"> Group discussion on the topic "An entrepreneur is not born but created". Conducting a classroom quiz on various aspects of entrepreneurship. Chart preparation on types of entrepreneurs Brainstorming activity on What motivates an entrepreneur 	08
2.	Identify the barriers to entrepreneurship	<ul style="list-style-type: none"> Barriers to entrepreneurship, Environmental barriers, No or faulty business plan, Personal barriers 	<ul style="list-style-type: none"> Group discussion about "What we fear about entrepreneurship" Activity on taking an interview of an entrepreneur. 	04
3.	Identify the attitude that make entrepreneur successful	<ul style="list-style-type: none"> Entrepreneurial attitude 	<ul style="list-style-type: none"> Group activity on identifying entrepreneurial attitude. 	04
4.	Demonstrate the	<ul style="list-style-type: none"> Entrepreneurial competencies 	<ul style="list-style-type: none"> Playing games, such as "Who 	04

knowledge of entrepreneurial attitude and competencies	<ul style="list-style-type: none"> • Decisiveness, • Initiative • Interpersonal skills-positive attitude, stress management • Perseverance • Organisational skills- time management, goal setting, efficiency, managing quality. 	<p>am I".</p> <ul style="list-style-type: none"> • Brainstorming a business ideas • Group practice on "Best out of Waste" • Group discussion on the topic of "Let's grow together" • Group activity on listing stress and methods to deal with it like Yoga, deep breathing exercise. 	
			Total Duration in Hours 20

Unit 5: Green Skills – IV

Sn	Learning Outcome	Theory (05 Hours)	Practical (10 Hours)	15
1.	Identify the benefits of the green jobs	<ul style="list-style-type: none"> • Green jobs • Benefits of green jobs • Green jobs in different sectors: <ul style="list-style-type: none"> • Agriculture • Transportation • Water conservation • Solar and wind energy • Eco-tourism • Building and construction • Solid waste management • Appropriate technology 	<ul style="list-style-type: none"> • Group discussion on the importance of green job, • Chart preparation on green jobs in different sectors. 	08
2	State the importance of green jobs	<ul style="list-style-type: none"> • Importance of green jobs in <ul style="list-style-type: none"> • Limiting greenhouse gas emissions, • Minimizing waste and pollution, • Protecting and restoring ecosystems, • Adapting to the effects of climate change 	<ul style="list-style-type: none"> • Preparing posters on green jobs, • Group activity on tree plantation. • Brainstorming different ways of minimizing waste and pollution 	07
			Total Duration in Hours 15	

GRADE XII, Part B: Vocational Skills

Sn	Units	Duration in Hours
Unit 1	Data Quality Management	75
Unit 2	Documentation	30
Unit 3	Workplace Data Management	30
Unit 4	Inclusive and Environmentally Sustainable Workplaces	15
	Total Duration	150

Unit 1: Data Quality Management

Sn	Learning Outcome	Theory (25 Hours)	Practical (50 Hours)	75
1	Evaluate various process, methods and standards that can be implemented to improve data efficiency and quality	<ul style="list-style-type: none"> Quality assurance in Data labeling Data quality, Data drift, Data Anomalies, Aspects of annotation quality Data objects, Data measurements, Data accuracy, Baseline for expected accuracy 	<ul style="list-style-type: none"> Demonstrate a clear understanding of the standard operating procedures by developing sample annotated database set. Carry out timely quality assurances to confirm that the labelling is correct. 	20
2	Evaluate the Quality Assurance Techniques	<ul style="list-style-type: none"> Introduction of quality, assurance techniques, Define sub-sampling, Setting a "Gold Standard/Set", Define annotator consensus, Using scientific methods to determine label consistency Annotator levels, Edge case management and review. 	<ul style="list-style-type: none"> Employ data quality standards to ensure that the data is safe from malpractice, potential leaks, or corruption, Perform and run pre-defined tests scripts to identify wrongful labelling. 	20
3	Employ proper classification and storage of raw and annotated data to avoid misclassification and maintain data security	<ul style="list-style-type: none"> Data privacy and security, Security considerations for data annotation and labeling, Physical security, Internal security, Cybersecurity. 	<ul style="list-style-type: none"> Employ methods to identify open-source data sets using relevant terms/keywords, Demonstrate data privacy and security in data annotation. 	15
4	Evaluate the balanced and	<ul style="list-style-type: none"> Balanced and unbalanced data sets and their impact, 	<ul style="list-style-type: none"> Identify balanced and unbalanced data sets, 	20

	imbalanced dataset and Sustain Data Quality	<ul style="list-style-type: none"> Balanced dataset, Imbalanced dataset, Problems with Imbalanced datasets Techniques to convert imbalanced datasets into balanced datasets Steps to ensure and sustain data quality Data labeling accuracy (Consensus algorithm, Benchmarking and gold standard, Cronbach's alpha test) 	<ul style="list-style-type: none"> Demonstrate to convert imbalanced datasets into balanced datasets. 	
			Total Duration in Hours	75

Unit 2: Documentation

Sn	Learning Outcome	Theory (10 Hours)	Practical (20 Hours)	30
1.	Employ various methods to evaluate the accuracy of annotated data	<ul style="list-style-type: none"> Ontology-based text annotation, Ontology-based annotation of multimedia language, General multimedia ontology, Linguistic domain ontology, Language profiles (XML) 	<ul style="list-style-type: none"> Develop documents and reports in the standard format on the observed resolved and unresolved issues and errors. Demonstrate the Ontology-Based Text Annotation 	08
2.	Prepare documentation and reports as per the standard templates	<ul style="list-style-type: none"> Ontology-driven annotation of data tables, Difference between metadata and annotations 	<ul style="list-style-type: none"> Prepare documentation of data ontology based on the project goals. Analyze Ontology-Driven Annotation of Data Tables 	07
3.	Evaluate various relations between Datasets	<ul style="list-style-type: none"> Significant relations between datasets, Relationship testing, Data profiling, Schema matching. 	<ul style="list-style-type: none"> Analyze significant relations between Datasets Demonstrate the Relationship Testing Analyze Schema Matching 	08
4.	Evaluate the importance of stakeholders in data annotation	<ul style="list-style-type: none"> Importance of various stakeholders in data annotation, Feedback to improve the data labelling process. 	<ul style="list-style-type: none"> Prepare summary reports as per the defined standards and templates for relevant stakeholders, List the Importance of various stakeholders in data annotation. 	07
			Total Duration in Hours	30

Unit 3: Workplace Data Management

Sn	Learning Outcome	Theory (15 Hours)	Practical (15 Hours)	30
1	Describe the standard formats to manage data/information effectively	<ul style="list-style-type: none"> • Introduction of Data Management • Types of Data Management • Importance of data management • Challenges in Data Management 	<ul style="list-style-type: none"> • Demonstrate the rule-based analysis of data/information • Demonstrate the Importance of data management 	06
2	Describe the Data Management and Data privacy	<ul style="list-style-type: none"> • Understanding of Data Management in the Remote Workplace • Understanding of Data privacy • Importance of Data privacy • Challenges of data privacy • Important technologies for data privacy • Importance of data privacy in today's digital world • Benefits of data privacy compliance 	<ul style="list-style-type: none"> • Perform data/information formatting into required types/forms • Identify the anomalies in the data • Demonstrate the Importance of data privacy 	06
3	Describe the Data privacy and Data sharing	<ul style="list-style-type: none"> • Understanding of Data Privacy in terms of Data Sharing • Understanding of Data Sharing in the Cloud • Understanding of Secure Data Sharing • Ways to Share Data Securely • Significance of providing accurate information • Benefits of Keeping Records Up to Date and Accurate • Consequences of Not Maintaining Accurate Business Records • Ensuring Records are Kept Updated and Accurate 	<ul style="list-style-type: none"> • Evaluate information and knowledge management systems • Apply information confidentiality guidelines • Demonstrate the ways of data sharing securely. 	06
4	Describe the various types of Data types	<ul style="list-style-type: none"> • Data Types and Formats • Internal and External Formats • Character Data Type • Numeric Data Type- Binary-Decimal Format, Float Format, Integer Format • Date Data Type- Separators, Time Data Type, Timestamp Data Type, 	<ul style="list-style-type: none"> • Examine the different data types and formats • Demonstrate the use of data types 	06

		<ul style="list-style-type: none"> Basing Pointer Data Type 		
5	Describe the Database management tools and CRM	<ul style="list-style-type: none"> Database management tools- MySQL, SQL Server Management Studio, Oracle RDBMS, Salesforce, DevOps, Visual Studio Code, ESM Tools, PhpMyAdmin CRM database Importance of a CRM Database Best Practices for CRM Management 	<ul style="list-style-type: none"> Use CRM database to record and extract information Demonstrate the Importance of a CRM Database Evaluate the various Database management tools 	06
			Total Duration in Hours	30

Unit 4: Inclusive and Environmentally sustainable workplaces

Sn	Learning Outcome	Theory (07 Hours)	Practical (08)	15
1	Illustrate sustainable practices at work place for energy efficiency	<ul style="list-style-type: none"> Environmental sustainability Importance of environmental sustainability, Implementing sustainability at the workplace, Benefits of a sustainable workplace environment, Creating a sustainable workplace, Workplace policy for sustainability 	<ul style="list-style-type: none"> Practice of Implementing Sustainability at the Workplace Demonstrate the Importance of environmental sustainability Evaluate the Sustainable Workplace Evaluate the policy for sustainability at workplace. 	04
2	Describe different approaches for efficient energy resource utilization and waste management	<ul style="list-style-type: none"> Approaches of waste management, Principles of waste management, Advantages of waste management, Methods to control waste management 	<ul style="list-style-type: none"> Practice the segregation of recyclable, nonrecyclable and hazardous waste generated Demonstrate the various methods to control waste management 	04
3	Identify stereo types and prejudices associated with people with disabilities	<ul style="list-style-type: none"> Stereotype, Prejudice and discrimination: barriers to social inclusion Category to Combative Implicit Biases, Automatic Biases, Ambiguous Biases, Ambivalent Biases Discrimination and prejudice Impact on social inclusion 	<ul style="list-style-type: none"> Demonstrate different methods of energy resource use optimization and conservation Analyze the discrimination and prejudice Evaluate the various Implicit biases 	04
4	Discuss the	<ul style="list-style-type: none"> Gender equality in the 	<ul style="list-style-type: none"> Demonstrate essential 	03

importance of promoting, sharing and implementing gender equality and PwD sensitivity guidelines at organization level	Workplace <ul style="list-style-type: none"> • Discrimination-free company culture, • Equal learning and development opportunities, • Implementation of gender sensitivity at the workplace 	communication methods in line with gender inclusiveness and PwD sensitivity <ul style="list-style-type: none"> • Practice the gender equality and sensitivity in the workplace 	
		Total Duration in Hours	15

6. ORGANISATION OF FIELD VISITS and OJT

In a year, at least 3 field visits/educational tours and On-the-Job-Training (OJT) in vacation should be organised for the students to expose them to the activities in the workplace. Visit the data centre in industry and observe the following: Location, working environment, data annotation tools. data annotation process. Students should achieve the following outcomes.

1. Explain the concept of data and process of data annotation,
2. List and Explain the most common approaches of data annotation such as In-house Data Labelling, Crowdsourcing, Outsourcing, Machine Based Annotation, Data Annotation in AI, Training Data in Machine Learning, Supervised Learning, Unsupervised Learning, Semi-Supervised Learning
3. Explain the data labelling process - Data Collection, Data Tagging, Quality Assurance, Human in the Loop (HITL)
4. List the common types of data labelling - Computer Vision, Image Classification, Image Segmentation,
5. Best Practices for Data Labelling

7. LIST OF EQUIPMENT AND MATERIALS

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

Classroom Aids	Equipment	Software
<ul style="list-style-type: none"> • Whiteboard and Markers • Chart paper and sketch pens • LCD Projector and Laptop for presentations 	<ul style="list-style-type: none"> • PCs/Laptops • Internet with Wi-Fi (Min 2 Mbps Dedicated) 	<ul style="list-style-type: none"> • Annotation Software such as CoLabeler, Labelbox, Plainsight, SuperAnnotate, Label Studio • Open-Source tools such as CVAT, VoTT, VGG, LabelMe, DataTurks, Diffgram • Documentation tools such as Adobe and MS-Word

Classroom Aids

Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop

8. TEACHER'S/TRAINER'S QUALIFICATION

Qualification and other requirements for appointment of vocational teachers/trainers on contractual basis should be decided by the State/UT. The suggestive qualifications and minimum competencies for the vocational teacher should be as follows:

Minimum Educational Qualification	Specialization	Age Limit	Industry Experience		Training Experience	
			Years	Specialization	Years	Specialization
Bachelor Degree in Engineering/ Technology Certified in relevant CITS course, OR SSC Certified on the said job role "Data Annotator" (SSC/Q8120) with Minimum accepted score is 80%	Computer Science/ IT Good communication skills in English and regional language, Practical skilled to handle and operate tools and equipment with safety	18-37 years (as on January 1 of current year) Age relaxation to be provided as per Govt. rules	3 years full-time experience	Data Annotator or related roles	2 years full-time experience	Data Annotator or related roles

Note – The qualifications for vocational teachers mentioned above is suggestive and not prescriptive. The States/ UTs can make modifications in the qualifications for appointment of vocational teachers/ trainers as per their requirement through a committee appointed by the competent authority in the State/ UT Directorate/ Department of School Education.

Vocational Teachers/Trainers form the backbone of Vocational Education being imparted as an integral part of Samagra Shiksha. They are directly involved in teaching of vocational subjects and also serve as a link between the industry and the schools for arranging industry visits, On-the-Job Training (OJT) and placement.

These guidelines have been prepared with an aim to help and guide the States in engaging quality Vocational Teachers/Trainers in the schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are mode and procedure of selection of Vocational Teachers/Trainers, Educational Qualifications, Industry Experience, and Certification/ Accreditation.

The State may engage Vocational Teachers/Trainers in schools approved under the component of Vocationalisation of Secondary and Higher Secondary Education under RMSA in following ways:

1. Directly as per the prescribed qualifications and industry experience suggested by the PSS Central Institute of Vocational Education(PSSCIVE), NCERT or the respective Sector Skill Council(SSC). **OR**
2. Through accredited Vocational Training Providers accredited under the National Quality Assurance Framework (NQAF*) approved by the National Skill Qualification Committee on 21.07.2016. If the State is engaging Vocational Teachers/Trainers through the Vocational Training Provider (VTP), it should ensure that VTP should have been accredited at NQAF Level 2 or higher.

* *The National Quality Assurance Framework (NQAF) provides the benchmarks or quality criteria which the different organisations involved in education and training must meet in order to be accredited by competent bodies to provide government-funded education and training/skills activities. This is applicable to all organizations offering NSQF-compliant qualifications.*

The educational qualifications required for being a Vocational Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers / trainers deployed in the schools have relevant technical competencies for the NSQF qualification being delivered. The Vocational Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

To ensure the quality of the Vocational Teachers/Trainers, the State should ensure that a standardized procedure for selection of Vocational Teachers/Trainers is followed. The selection procedure should consist of the following:

1. Written test for the technical/domain specific knowledge related to the sector;
2. Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
3. Practical test/mock test in classroom/workshop/laboratory.

In case of appointment through VTPs, the selection may be done based on the above procedure by a committee having representatives of both the State Government and the VTP.

The State should ensure that the Vocational Teachers/ Trainers who are recruited should undergo induction training of 20 days for understanding the scheme, NSQF framework and Vocational Pedagogy before being deployed in the schools.

The State should ensure that the existing trainers undergo in-service training of 5 days every year to make them aware of the relevant and new techniques/approaches in their sector and understand the latest trends and policy reforms in vocational education.

The Head Master/Principal of the school where the scheme is being implemented should facilitate and ensure that the Vocational Teachers/Trainers:

- Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- Make effective use of learning aids and ICT tools during the classroom sessions;
- Engage students in learning activities, which include a mix of different methodologies, such as project based work, team work, practical and simulation based learning experiences;
- Work with the institution's management to organise skill demonstrations, site visits, on-job trainings, and presentations for students in cooperation with industry, enterprises and other workplaces;
- Identify the weaknesses of students and assist them in up-gradation of competency;
- Cater to different learning styles and level of ability of students;
- Assess the learning needs and abilities, when working with students with different abilities
- Identify any additional support the student may need and help to make special arrangements for that support;
- Provide placement assistance

Assessment and evaluation of Vocational Teachers/Trainers is very critical for making them aware of their performance and for suggesting corrective actions. The States/UTs should ensure that the performance of the Vocational Teachers/Trainers is appraised annually. Performance based appraisal in relation to certain pre-established criteria and objectives should be done periodically to ensure the quality of the Vocational Teachers/Trainers. Following parameters may be considered during the appraisal process:

- Participation in guidance and counseling activities conducted at Institutional, District and State level;
- Adoption of innovative teaching and training methods;
- Improvement in result of vocational students of Class X or Class XII;
- Continuous up-gradation of knowledge and skills related to the vocational pedagogy, communication skills and vocational subject;
- Membership of professional society at District, State, Regional, National and International level;
- Development of teaching-learning materials in the subject area;
- Efforts made in developing linkages with the Industry/Establishments;
- Efforts made towards involving the local community in Vocational Education
- Publication of papers in National and International Journals;
- Organisation of activities for promotion of vocational subjects;
- Involvement in placement of students/student support services.

9. LIST OF CONTRIBUTORS

Monika Sharma, Assistant Professor (IT-ITeS), Department of Engineering and Technology, PSS Central Institute of Vocational Education (PSSCIVE), Shyamla Hills, Bhopal – 462 002, M.P., India

Dr. Deepak D. Shudhalwar, Professor (CSE), Head, ICT Centre, Department of Engineering and Technology, PSS Central Institute of Vocational Education (PSSCIVE), Shyamla Hills, Bhopal – 462 002, M.P., India, Email: dds.ncert@nic.in, dipakds@yahoo.com, **Member Coordinator**



PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION, NCERT, BHOPAL