Curriculum Development and Revision Manual

Of

Technical and Vocational Training Institute

V1.0

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1. Introduction

This curriculum guide provides the definitive framework for TVTI curriculum development and it is designed to equip graduates with the precise competencies required to excel in the modern industry workforce. The guideline consist Outcome Based Training curriculum revision and development process through intensive data and rigorous analysis of the industry value chain. The guideline involves beyond

traditional subject based Curriculum to focus on the integrated competency of knowledge, skills, and abilities from advanced international competency, real world market, policy analysis, and current curriculum gap that create value within the specific industry or sector. By aligning curriculums with real world processes and validated employer needs, thus the outcome based curriculum ensures graduates are not only job ready but are also innovative and problem solvers capacity.

2. Objectives of this manual

- This manual defines the curriculum development and revision process of Technical and Vocational Training Institute (TVTI) so that they can develop or revise the curricula more efficiently and consistently.
- This manual defines the approval process for the development and revised curricula of TVTI so that the quality can be appropriately maintained.
- This manual provides the basic description guidelines for the program overview, program structure with program training objectives (PTO) and Program outcome (PO), program requirement, quality assurance method, the course coding scheme, the program composition including the semester-based courses breakdown, course profile with course learning outcome (CLO).
- This manual provides the standard template for the curriculum handbook of TVTI. The template is composed of two parts; Part I - program handbook, Part II course handbook. The former includes the overall information about the program which the department is running, and part II is about the profiles of whole courses which the program is opening to the students.
- This manual provides the distinct templates for the theory-only courses and courses having practical nature so that the curriculum can be developed to be more practice- oriented.

3. Curriculum Development

The process for developing a new curriculum consists of the following process;

1. Conducting a Detailed Assessment

The initial, critical phase involves organizing data from the key areas,

- The real world market, including labor market trends and employer needs assessment.
- The advancement of technical and academic content in the international context through desk review.
- National policy advancements and strategic direction.

2. Analyzing and Mapping the Industry or Professional Value Chain

This process consists deconstruction of specific sector or profession into its primary and support activities that collectively create value. The goal is to understand the complete sequence of operations, from initial inputs to final service delivery.

3. Translating Value Chain Activities into Competencies

Each identified activity within the value chain is then converted into a set of teachable and assessable Knowledge, Skills, and Abilities (KSAs) competencies.

4. Defining Program Training Objectives and Outcomes

The listed competencies are categorized into logical areas and functions. These categorized competencies are then used to develop clear Program Training Objectives and measurable Program Outcomes, ensuring the curriculum is aligned with its intended goals.

5. Structuring the Curriculum and Developing Courses

The competencies are sequenced from simple to complex to form individual courses, which are then assigned to the appropriate year of delivery. Each course is coded, and detailed course breakdown is developed.

6. Finalizing Curriculum

Using an Outcome Based Training (OBT) curriculum template, the actual syllabus, learning content, and full curriculum document are developed. This ensures all components are integrated and directly linked to the defined competencies and outcomes.

4. Curriculum Revision

The revision cycle of the normal curriculum is at least at the interval of every 4 years. However, if there is policy intervention or urgent revision requirement, the department can revise its curriculum and needs to get approval.

Organizing Input Documents for Revision: the revision process must be evidence-based. The review committee shall collect and analyze the following data before proposing changes:

- Tracer Study Reports: To understand graduate employment patterns, career progression, and perceived relevance of their training.
- Employee/Industry Survey Results: To identify emerging skills, technologies, and competencies valued by employers.
- Policy Documents: To ensure full compliance with national TVET policies, regulatory standards, and accreditation criteria.
- Existing Curriculum Review Report: Including:
    - Course-level training outcome achievement data.
    - Student feedback and performance metrics.
    - Gap analysis comparing current offerings with industry needs.

Revision and analyzing on mapping the Industry Value Chain

Revision of VCA maps is done to the complete sequence of operations and validating to fit to the current advancement of the industry from initial inputs to final service delivery, often through input document.

Translating the improved Value Chain Activities into Competencies

Each identified activity through review within the value chain is converted into a set of teachable and assessable Knowledge, Skills, and Abilities (KSAs).

Redefining Program Objectives and Outcomes

The revised and validated competencies are categorized into logical clusters; the clusters are used to develop clear Program Educational Objectives (PEOs) (3 to 4 years of long-term career goals) and specific, measurable Program Learning Outcomes (PLOs).

Restructuring the Curriculum and Developing Courses

The competencies are sequenced from simple to complex to form the program architecture.

Finalizing Curriculum and Syllabus Documents

Using an Outcome-Based Training (OBT) template, the final documents are produced. The revision of the detailed syllabus for each course and the comprehensive program curriculum is developed and approved by concerned body.

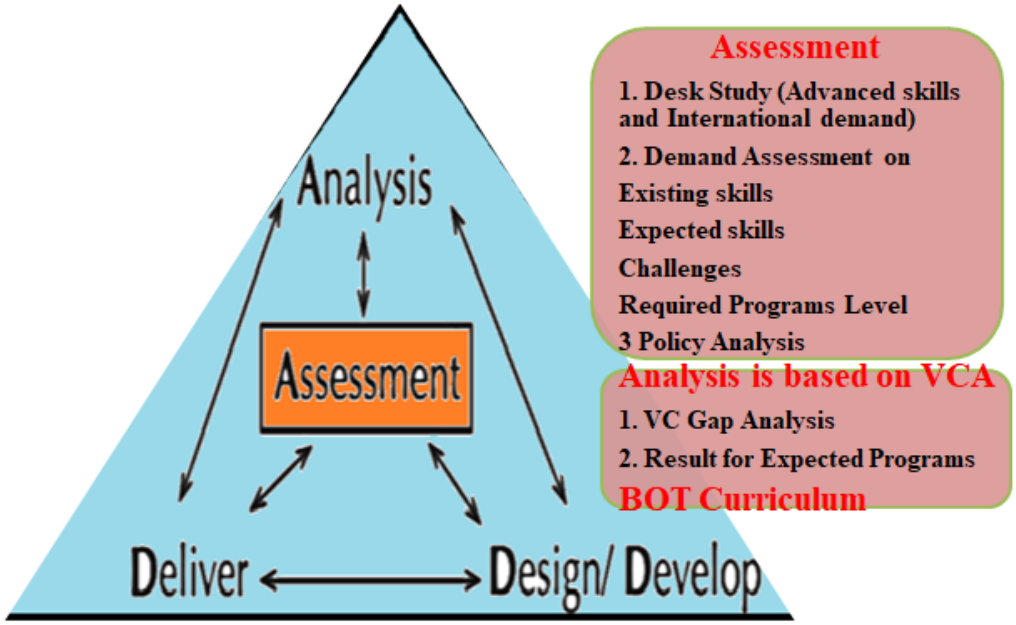

Figure 1 Curriculum Developments and Revision Process

5. Program handbook description

Table 1 Detailed description of the main major components of program handbook

Title	Description guideline
1.Introduction	
1.1. Background of the institute	• Describe the background information that is required to understand the development and mandate of the institute
1.2. Vision and mission of the Institute	• Link with the Ethiopian TVET sector vision, mission, goals, and values
1.3. Background of the Program	• Describe the background information that is required to understand the rationale and objectives of this program
1.4. Rationale of the revision	• Describe the need for curriculum design including the new Ethiopian education road map and related policy and strategies. • Specify the reasons for this curriculum revision • Rationales for each revision will be explicitly included
2. Structure	
2.1. Program training objectives (PTO)	• Describe the objective of the program, which this program aims to deliver after finishing the study with in expected time of 3 to 4 years through core points • Specify the potential professional career paths of the grogram graduates
2.2. Mapping of PTO and Institute Mission	• Align with the objectives and the mission of the TVTI to show the PTO are going with your mandate
2.3. Program Outcome (PO)	• Describe the outcome of the program explicitly as soon as they complete the program in core points • Specify the differentiation points of this program • Specify the outcome of the revision

2.4. Mapping of PO and PTO	• Align with the program outcome and objectives of the TVTI to show the outcome are going with market
2.5. Graduate profile	• Describe the competencies in knowledge, skill, and attitude, which should be met by the program graduates • Describe the certification requirements which should be met by the program graduates
2.6. Program composition	• Describe the common , pedagogical, supportive, major, and elective courses of the teaching program and for non-teaching exclude pedagogical • Specify the pre-requisite relation of courses if needed • Specify the same alternates of courses if needed
3. Program Requirements	

3.1 Total Credit Hour Requirements	• Total credit shall be 136 to 144 • Regular 2 semester with 15 to 18 credits • Extension/Weekend 3 semester with 9 to 12 credits • Summer 3 semester with 9 to 12 credits
3.2 Admission requirement	• Describe the admission requirements for this program explicitly. • Describe the aptitude and disposition suitable for the applicants of this program
3.3 Duration of study	• Specify the minimum and maximum study duration of the Program
3.4 Graduation Requirements	• Specify the graduation requirements of this program explicitly in lined with the TVTI legislation.
3.5 Resources of the program	• Describe the human resources who are involved in running this program Describe the teaching and learning facilities which are utilized to run this program including lecture rooms, practice labs, workshops, libraries, etc. and classify as: 3.5.1 Human Resource 3.5.2 Facilities 3.5.3 Infrastructure
4. Mode of delivery	Mixed, parallel, semester, block
5. Degree Nomenclature	In English and Amharic
6. Grading system	• Provide the academic policy/legislation for grading
7. Program delivery and quality assurance	
7.1 Training Method	• Describe the methods of teaching which are applied to this program • Describe the study pre-requisites for each teaching method

7.2 Assessment and evaluation Mechanisms	• Provide the standard guidelines for the assessment and evaluation
7.3 Quality Assurance	• Quality assurance policy to maintain the high-quality curriculum • Quality assurance policy to maintain the high-quality competencies of the graduates
8. Course profile	
8.1 Course coding	• Describe the standard coding scheme for general, pedagogical, supportive, major, elective courses
8.2 List of courses and category	• The list and category consists common courses, core course, supportive course, and pedagogical courses;
8.3 Semester-based breakdown	• Breakdown the courses of this program to be semester-based. • Specify the pre-requisite relation of courses if needed • Specify the same alternates of courses if needed
8.4 Course outline	Describe about the Course information, description, objectives, method of instruction, learning outcomes, and detail course outline
9. Quality management system	• A formal framework to standardize processes and ensure consistent quality. • Focuses on meeting customer requirements and driving continuous improvement. • Uses data and evidence to make decisions and solve problems.

6. Course handbook Description

Table 2 Detailed description of the main major components of course handbook

Course category	Course description
1. Instructor information	• Describe the name, office, contact, office hours of the course instructor and other teaching team member information (i.e., Teaching or Technical Assistant, if any) • Update this information when instructor is changed.
2. Course information	• Describe the title, code, credit hours, workload, pre-requisite, target group, semester, course status
3. Course description and objectives	• Introduce the course • Specify the objectives of the course
4. Method of instruction	• Specify the teaching method applied to this course • Specify the study requirements for this course
5. Course Learning outcomes (CLO)	• Specify the knowledge, practical, and attitude outcomes • Described the alignment on matrix with PO, method of training and assessment method
6. Detail course outline	• Describe the week-based topics to be covered by the lecture hours, learning outcomes, assignments and/or activities for the theory-only course • Describe the week-based topics to be covered by the lab hours, learning outcomes, the required equipment, and the continuous assessments for the practice-included course

7. Suggested text and/or reference books	• Specify the main textbook • Specify the references
8. Assessment methods	• Specify the assessment methods for the course explicitly
9. Academy honesty	• Specify the academy honesty requirement
10. Submitting date	• Specify the policy for the submitting date of the reports
11. Classroom behavior	• Specify the classroom behavior requirement

7. Annex 1: Cover Page

- ✓ **Cover page 1**

Technical and Vocational Training Institute

Faculty of _____

Department of _____

Undergraduate Curricula for Regular Program

V x.x

Year of Excellence

Date : _____

Addis Ababa, Ethiopia

✓ Cover page 2

Prepared by:

Department of _____

Endorsement

This curriculum document is endorsed by the

Technical and Vocational Training Institute Senate

Date : _____

8. Annex 2: Program Handbook

1. Introduction

1.1 Background of the Institute

The FDRE Technical and Vocational Education and Training Institute (TVETI), formerly named the Federal Technical Vocational Educational and Training Institute (FTVET Institute) and Ethiopian Technical University, was established in 2011 under the Council of Ministers Proclamation No. 245/2011. Its mandate was to produce highly professional and technically efficient TVET teachers, leaders, and technicians. The primary purpose for establishing this higher institute was the absence of a TVET institution capable of training competent technical and vocational teachers and leaders at graduate and postgraduate levels, aligned with occupational standards and an outcome-based system.

Currently, the institute has been re-established as the Technical and Vocational Training Institute (TVTI) under the Council of Ministers Proclamation No. 1263/2021. The TVTI aspires becoming a globally recognized center of excellence for training TVET instructors, leaders, and technologists by 2030. Its mission is to produce competent, innovative, and resourceful TVET trainers, leaders, and industry technologists through high-quality short and long-term training programs, demand-driven research, technology dissemination, and consulting services that support national development goals, particularly in micro and small scale enterprises.

At its inception, the institute offered degree programs in five departments: Automotive, Construction, Electronics/Electrical, Information and Communication Technology, and Manufacturing Technology. Two years later, Railway and Surveying Technology programs were added. These programs encompassed ten specializations: Automotive, Building, Road and Water Construction, ICT, Electrical and Control, Electronics and Communications, Manufacturing, Rolling Stock Railways, and Surveying.

Over the past fifteen years, the institute has achieved significant progress in facilities, accessibility, and program diversification. Currently, TVTI runs 23 undergraduate and 20 graduate programs in regular,

extension (evening and weekend), and summer modalities across its main campus and 15 satellite campuses. These programs span various departments, including TVET Leadership, Hotel Management, Tourism Management, Architectural Design Technology, Building Construction Technology, Road Construction Technology, Surveying Technology, Water Supply and Sanitary Technology, Water Works and Irrigation Technology, Wood Science and Technology, Electrical and Control Technology, Electronics and Communication Technology, Information Communication Technology, Manufacturing Technology, Automotive Technology, Garment Technology, Leather and Leather Products Technology, Textile Technology, Fashion Design, Fruit and Vegetable Processing Technology, Dairy Processing Technology, Meat Processing Technology, Crop/Plant Production Technology, and Animal Production Technology.

The institute plays a pivotal role in Ethiopia's socio-economic development by bridging the gap between training and employment. TVTI's programs are designed to equip trainees with practical, industry relevant skills that meet both domestic and international labor market demands. The curriculum emphasizes hands on training and outcome based learning, ensuring graduates are work-ready upon completion. By focusing on TVET, TVTI addresses Ethiopia's high youth unemployment rate. The institute collaborates closely with industries to align its training programs with current workplace requirements and is actively expanding research in emerging technical fields to support Ethiopia's technological advancement. Through strengthened collaborations with international stakeholders, TVTI promotes knowledge exchange and best practices in TVET. Through these efforts, TVTI remains committed to producing skilled professionals who will contribute to Ethiopia's economic growth and transformation, while providing meaningful employment opportunities for the country's youth.

As one of Ethiopia's flagship institutes, TVTI collaborates with international and local partners to establish itself as a Center of Excellence in TVET. This initiative contributed to strengthen Ethiopia's manufacturing and service sectors as primary drivers of industrial growth by developing critical human resources particularly TVET trainers, leaders, and technologists. The TVTI advancement is based on developing market relevant, out come and competency based training; upgrading essential training facilities and equipment; and enhancing productivity, quality, and competitiveness across existing and emerging industries. Through technology transfer and enterprise, TVTI supports the export earnings and the expansion

of small and medium enterprises. The institute actively contributes to government efforts to accelerate manufacturing sector growth by producing and optimizing industrial facilities and services, and training skilled manpower. Additionally, TVTI intensifies its research and community service programs to boost the competitiveness of Ethiopian industries in both global and local markets, with particular focus on improving efficiency and product quality.

1.2. Vision and Mission of the Institute

Vision

FDRE Technical and Vocational Training Institute aspires to be a world-class institute in 2025 EC by achieving delivery of quality training, problem-solving research, community service, and technology and enterprise development.

Mission

M1: Empowering TVT trainers, Industry technicians, and TVT leaders by providing internationally standardized undergraduate and postgraduate courses as well as short-term training.

M2: Enhancing the efficiency of the skill development sector by conducting problem-solving studies and research and community service activities.

M3: Implementing technology and enterprise development activities supported by research and development that enhance the productivity and competitiveness of the industry.

1.3. Background of the Program

This needs to consist Describe the background information that is required to understand the rationale and objectives of this program and link with the Ethiopian TVET sector vision, mission, goals, and values.

Sample:

The BSc in Information Technology program aims to produce graduates who are well-versed in the theoretical underpinnings of computer systems and proficient in practical applications and emerging technologies.

The field of Information Technology (IT) plays a pivotal role in the modern digital economy. Rapid technological changes have significantly transformed the way we communicate, learn, and work. As a result, the demand for competent IT professionals with a solid foundation in both theoretical and practical aspects of technology has increased. This curriculum is designed to equip graduates with essential technical, pedagogical, and professional skills to address the complex challenges of the IT industry and society.---------

1.4. Rationale of the Program

The rationale needs to address the following points:

- Describe the need for curriculum design including the new Ethiopian education road map and related policy and strategies.
- Specify the reasons for this curriculum development and revision
- Rationales for each development and revision will be explicitly included
- The rationale behind this program is to address national and global demands for program professionals who are adaptable, innovative, and committed to lifelong learning.
- The program also aims to bridge the gap between academia and industry by fostering project-based learning and real-world application.

2. Structure of the Program

2.1. Program Training Objectives (PTO)

• Develop program training objective, which this program aims to deliver professional service after

finishing the study with in expected time of 3 to 4 years and written in core points

- Specify the potential professional career paths of the grogram
  - ✓ Sample:

PTO Code Program Training Objective

PTO1	Equip students with core knowledge in computing, programming, and IT systems.
PTO2	Develop problem-solving and critical thinking skills for IT solutions.
PTO3	Prepare students for professional practices, ethics, and effective communication.
PTO4	Enable students to conduct research and apply modern tools and technologies.
PTO5	Foster entrepreneurship and project management skills.
PTO6	Promote awareness of societal, environmental, and legal contexts in technology.

2.2. Mapping of PTO and Institute Mission

Table 3: The matrix relation between PTO and Mission

PTO	M1	M2	M3
PTO1	✓	✓	
PTO2	✓		
PTO3	✓		✓
PTO4	✓	✓	✓
PTO5	✓		✓

PTO6	✓	✓	✓

2.3. Program Outcomes (PO)

The program outcome requires to include;

- Describe the outcome of the program explicitly as soon as they complete the program in core points
- Specify the differentiation points of this program
- Specify the outcome of the revision
  - ✓ Sample

PO1: Apply knowledge of mathematics, natural science, technology fundamentals and a technological specialization to the solution of complex subject-matter related problems.

PO2: Demonstrate comprehensive professional knowledge in technical and vocational education, including industry standards, curriculum development, and instructional strategies.

PO3: Identify, formulate, and analyze complex technical problems using foundational principles.

PO4: Design systems or processes that meet needs considering health, safety, culture, and environment.

PO5: Conduct research using proper methods, analyze and interpret data, and synthesize findings.

PO6: Apply modern tools and IT techniques to address complex problems effectively.

PO7: Evaluate the impact of solutions in social, legal, health, and cultural contexts.

PO8: Assess the sustainability and environmental impact of professional activities.

PO9: Demonstrate ethical conduct and professional responsibility.

PO10: Work effectively individually and in multidisciplinary teams.

PO11: Communicate complex ideas clearly in written, oral, and visual forms.

PO12: Apply project management and financial principles to real-world projects.

PO13: Engage in lifelong learning for continuous professional development.

2.4. Mapping of PO and PTO

Table 4: Mapping PO and PTO

	PEO-1	PEO-2	PEO-3	PEO-4
PO-1		√		
PO-2		√		
PO-3		√		
PO-4		√		
PO-5				√
PO-6				√
PO-7				√
PO-8		√		
PO-9			√	
PO-10		√		
PO-11			√	
PO-12	√			

2.5 Graduate profile

- Describe the competencies in knowledge, skill, and attitude, which should be met by the program graduates
- Describe the certification requirements which should be met by the program graduates

2.6. Program Composition

Major/Core Courses: Computer programming, data structures, networking, databases, software engineering.

Supportive Courses: Mathematics, communication skills, ethics, entrepreneurship.

Professional Courses (Pedagogical): Curriculum development, instructional methods (for those preparing to teach),

Table Program composition

Credit	Category		
	Core courses	Supportive courses	Professional courses
Total			
Percentage			

2.7. Course Learning Outcomes (CLOs) Defined at course level and mapped to POs to ensure alignment.

Describe about the development of CLO

Descript about the development of matrix CLO with PO

3. Program Requirements

3.1. Total Credit Hour Requirements Typically 136–144 credit hours.

The normal semester load for five years' program is 15 Cr.hr to 18 Cr.hr. However, a curriculum may have 18 Cr. hrs. Per semester twice except the final year.

The normal semester load in evening and weekend programs shall be 9 to 12 credit hours. The normal load for the evening and the weekend students in a summer semester shall be 9 to 12 credit hours.

Accordingly, under normal circumstances, the four years' undergraduate regular programs shall have the following structures.

Table 5: Structures of Undergraduate Regular Programs

Year	Semester	Four years program
Year I to Year IV:	Semester I	• A total of 15 to 18 Cr.hr course work
	Semester II	• A total of 15 to 18 Cr.hr course work

3.2. Admission Requirements

Successful completion of Secondary education

Entrance examination (as per national policy)

3.3. Duration of Study 4 years (8 semesters)

3.4. Graduation Requirements

Fulfillment of all credit hour requirements

Cumulative GPA ≥ 2.0

Final project completion and defense

3.5. Resource Requirements

3.5.1. Human Resource: Qualified academic and technical staff

3.5.2. Facilities: Classrooms, workshops, computer labs, internet access, digital library.

3.5.3. Infrastructure: IT infrastructure, power backup, e-learning platforms

4. Mode of Delivery: Regular, Evening, Weekend, and Summer

5. Degree Nomenclature Upon successful completion, graduates will receive: **Bachelor of Science in Information Technology (BSc in IT)**

6. Grading System Standard letter grading system (A-F) with GPA calculation

7. Program Delivery and Quality Assurance

7.1. Training Method: Lectures, lab sessions, project work, internships

7.2. Assessment and Evaluation Mechanism: Continuous assessment, final exams, project work

7.3. Quality Assurance Method: Internal audits, external reviews, tracer studies, curriculum review cycle

8. Course Profile

8.1. Course Coding E.g., IT101 for Introduction to IT, IT202 for Data Structures, etc.

8.2. List of Courses and Category (To be included based on credit distribution)

- ✓ **Course Category**

There are four course categories:

Category 0 = Common (National and University), Supportive Courses, and the courses given across the university/college/program.

Category 1 = Core/Compulsory Courses,

Category 2 = Core Elective Courses,

Category 3 = Pedagogical courses

Category 4 = Major Courses

For the programs that may have streams/focus area/, the student shall take a minimum of 12 credit hour focus area courses.

Table 6: General Courses

General Courses				
No	Course Title	Course Code	Credit Hr.	Prerequisite
1	Communicative English Language Skills I	FLEn 1011	3	None
2	General Physics	Phys. 1011	3	None
…				
Total			47	

Table 7: Vocational Pedagogy Courses

Vocational Pedagogy Courses				
No	Course Title	Course Code	Credit Hr.	Prerequisite
1	Assessment Method	VoPe 2012	3	None
…				
Total			12	

Table 8: Supportive Courses

Supportive Courses				
No	Course Title	Course Code	Credit Hr.	Prerequisite
1	Discrete Mathematics	Math 2010	3	Math.1012
…				
Total			9	

Table 9: Major Courses

Major Courses				
No	Course Title	Course Code	Credit Hr.	Prerequisite
1	Fundamentals of Networking	ITec 2031	3	None
2	Fundamentals of Database Systems	ITec 2035	3	None
	….			
Total			80	

Table 10: Elective courses

Elective Courses				
No	Course Title	Course code	Credit Hr.	Prerequisite
1	Introduction to Programming Frameworks	ITec403a	3	
2	Introduction to Artificial Intelligence	ITec 402	3	
	…			
Total			---	

8.3Breakdown of courses

- Breakdown the courses of this program to be semester-based.
- Specify the pre-requisite relation of courses if needed
- Specify the same alternates of courses if needed

Table 11: Breakdown for YEAR I – SEMESTER I and SEMESTER II

YEAR I – SEMESTER I							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Communicative English Language Skills I	FLEn 1011	3	3	0	0	None
2	General Physics	Phys 1011	3	2	3	0	None
		Total	18	19	3	0	

YEAR I – SEMESTER II							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Communicative English Language Skills II	FLEn 1012	3	3	0	0	FLEn 1011
2	Social Anthropology	Anth 1012	2	2	0	0	None
		Total	19	16	9	0	

Table 12: Breakdown for YEAR II – SEMESTER I and SEMESTER II

YEAR II – SEMESTER I							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Assessment Method	VoPe 2012	3	3	0	0	None
2	Global Trend	GlTr 2011	2	2	0	0	None
		Total	19	15	12	0	

YEAR II – SEMESTER II							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	General Methods of Teaching	VoPe 3012	3	3	0	0	None
2	Inclusiveness	SNIE 2012	2	2	0	0	None
		Total	20	15	15	0	

Table 13: Breakdown for YEAR III – SEMESTER I and SEMESTER II

YEAR III – SEMESTER I							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Introduction to Economics	Econ 3011	3	3	0	0	None
2	Data Structure and Algorithms	ITec 3031	3	2	3	0	ITec 2033
		Total	18	13	15	0	

YEAR III – SEMESTER II							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Curriculum development	VoPe 3012	3	3	0	0	None
2	Mobile Computing	ITec 3032	3	2	3	0	ITec 2038
		Total	20	13	21	0	

Table 14: Breakdown for YEAR IV – SEMESTER I and SEMESTER II

YEAR IV – SEMESTER I							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Research Method for IT	ITec 4039	3	2	3	0	None
2	Advanced Programming	ITec 4033	3	2	3	0	ITec 2038
		Total	19	10	21	0	

YEAR IV – SEMESTER II							
No	Course Title	Course Code	Credit				Pre-requisite
			Cr.hr	Lec.	Lab.	Tut	
1	Teaching Practice	VoPe 4012	3	0	3	0	VoPe 3012
2	Computer Maintenance	ITec 4032	3	2	3	0	None
		Total	18	6	18	0	

9. Annex 3: Course profile

8.4. Course Outline

Table 4: Course profile for the practice included courses

TECHNICAL AND VOCATIONAL TRAINING INSTITUTE			
Faculty of Textile and Apparel Fashion		Department: Leather and Leather Products Technology	
Program	MSc. in Leather Products Technology		
1. Instructor/s (teaching team members) Information			
Instructor Information		Other teaching team member information	
Name		Role	
Office Location		Name	
Phone Number		Office Location	
E-mail		Phone no. & Email	
Office Hours		Office Hours	
2. Course Information			
Course Name/Title	Advanced Leather Technology		

Course Code	LPTe5051					
Credit hours	3 Cr. Hrs /5 ECTS					
Workload in hour	Lecture	Tutorial	Lab.	Home study	Assessment	Total
	28	------	48	107	4	187
Pre-requisite, and/or other restrictions	None					
Target group	1st year MSC students					
Semester	Semester I					
Course of delivery	Semester based					
Status of the course	Major					
3. Course Description and Objectives						
Course Description:	This course provides an advanced understanding of leather making with strong emphasis on the scientific principles that govern the transformation of hides and skins into leather. Students will explore collagen structure, the chemistry of tanning, preservation techniques, and alternative sustainable methods. The course focuses on enabling learners to analyze the molecular structure of skin, the impact of various pre-tanning, tanning, and post-tanning processes, and the aesthetic and functional aspects of finished leather. It integrates both traditional and cleaner production methods to ensure relevance to modern leather processing industries.					

Course Objective:	At the end of this course, the students will be able to: • Understand the collagen structure and chemical composition of raw hides and skins. • Explain the scientific mechanisms of various tanning technologies. • Analyze the roles of different pre-tanning and post-tanning processes in determining final leather quality. • Evaluate various leather finishing techniques and identify suitable methods for desired outcomes. • Apply knowledge of eco-friendly materials and cleaner processing alternatives for sustainable leather production.
4. Method of Instruction	
Class lectures	2 lecture hours per week using PowerPoint presentations, diagrams, and video-supported demonstrations
Lab	3 lab hours every alternate week; includes hands-on pretanning, tanning, and finishing experiments
Study of lecture notes	Students are responsible for reviewing lecture notes and recommended materials weekly
Demonstrations	The various unit process and operations in leather manufacture starting from preservation to finishing will be demonstrated. The students will be demonstrated visually about the various leather products and design
Lab assignments	Each lab session includes a set of exercises and observation-based questions to be compiled in reports
Group Assignment	At least two group assignments requiring teamwork (3–5 members) on cleaner processing in leather making
Individual assignment	At least one major assignment involving critical review of a scientific article/book chapter related to collagen, tanning or post-tanning chemistry
5. Learning Outcomes	

5.1. Knowledge: - After completing this course, students will be able to:	
CLO1	Explain the hierarchical structure and chemistry of collagen in hides and skins.
CLO2	Describe the physical and chemical principles behind each stage of leather processing.
CLO3	Identify the chemistry and mechanism of different tanning systems, including chrome, vegetable, syntans, aldehydes, and emerging tanning agents.
CLO4	Understand the effect of skin structure, preservation methods, and pre-tanning operations on final leather quality.
CLO5	Understand the materials and techniques used in post-tanning and finishing operations.
CLO6	Recognize cleaner production methods and sustainable alternatives in leather processing.
CLO7	Discuss innovations such as nano composites, multifunctional reagents, enzymatic processes, and AI applications in leather making.
5.2. Practical skills	
CLO8	Conduct practical soaking, liming, tanning, dyeing, and finishing operations.
CLO9	Analyze defects in raw and processed leather and suggest appropriate remedies.
CLO10	Perform chemical evaluations in lab settings.
CLO11	Monitor and control variables such as pH, temperature, and reagent concentration during leather processing.

CLO12	Apply cleaner technologies in beamhouse and tanning operations.
CLO13	Record laboratory findings and interpret physical changes in leather quality.
5.3. Attitude	
CLO14	Demonstrate discipline and precision in lab-based procedures.
CLO15	Collaborate effectively in team-based processing and testing assignments.
CLO16	Show commitment to environmental responsibility and sustainable practices.
CLO17	Maintain curiosity and initiative for adopting new technologies in the leather sector.

6. Mapping of the course Learning Outcomes to the program Learning Outcomes, Teaching Methods, and Assessment:

	Program Learning Outcomes (PO)																		
Course Learning Outcomes (CLO)	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	------	**Training Methods**			**Assessment method**			
												L	**P**	**T**	**PT**	**test**	**Ass**	**quiz**
CLO1																		
CLO2																		
CLO3																		
CLO4																		
CLO5																		

CLO6																		
CLO7																		
CLO8																		
CLO9																		
CLO10																		
CLO11																		
CLO12																		
-------																		

7. Detailed Course Outline

Week	Topics to be covered (2 lecture hours)	Topics to be covered (3 lab hours)	Outcomes	Required materials /equipment/devices
Chapter One: - Collagen Structure and Biological Properties of Skin				

1, 2	**1.1 Sources and Importance of Hides and Skins** 1.1.1 Major animal sources: bovine, ovine, caprine, and exotic species 1.1.2 Role in the leather value chain 1.1.3 Influence of species, breed, age, and handling on raw material quality **1.2 Skin Structure and Functional Zonation** 1.2.1 Layers of the skin: epidermis, dermis, and hypodermis 1.2.2 Functional zones: papillary and reticular dermis 1.2.3 Presence of glands, hair follicles, blood vessels, and fat 1.2.4 Role of proteoglycans and intercellular components **1.3 Collagen Hierarchical Structure** 1.3.1 Primary, secondary, and tertiary structure of collagen	▪ Sample collection and observation of raw hides and skins from different species (goat, sheep, cow) ▪ Visual and tactile comparison of grain pattern, thickness, and follicle distribution ▪ Microscopic examination of skin cross-sections: epidermis, dermis, and collagen fibers ▪ Shrinkage temperature measurement of collagen ▪ Swelling behavior of collagen under acidic and alkaline conditions ▪ Comparative study on species variation in hide structure and quality attributes	CLO1 CLO2 CLO9 CLO10 CLO11 CLO14	Fresh raw hides/skins (goat, sheep, cow) Identification tags, lab gloves Grain pattern reference charts, magnifying lens, calipers Shrinkage tseter Buffer solutions (acidic, alkaline), pH meter, skin samples Documentation templates and visual inspection checklists

	1.3.2 Fibril formation and alignment in the dermis 1.3.3 Interaction with the matrix and contribution to grain layer formation 1.3.4 Influence on mechanical strength and aesthetic properties of leather **1.4 Collagen Chemistry and Reactivity** 1.4.1 Amino acid composition and its role in cross-linking 1.4.2 Functional groups: carboxyl, amine, and hydroxyl 1.4.3 Hydration, swelling, and thermal behavior of collagen 1.4.4 Influence of acidic and alkaline conditions **1.5 Isoelectric Point and pH Responsiveness** 1.5.1 Concept and relevance of the isoelectric point 1.5.2 pH effects on collagen charge and behavior 1.5.3 Use of buffers in processing: soaking, deliming, tanning, and retanning	▪ Identification of hide types using physical markers (hair follicle pattern, grain smoothness, thickness)		

	1.6 Biological and Environmental Influences on Skin Quality 1.6.1 Species-specific skin characteristics 1.6.2 Age-related changes in skin thickness and collagen density 1.6.3 Environmental and geographical factors affecting hide quality 1.6.4 Common defects due to parasites, stress, flaying, poor handling and preservation **1.7 Identification of Hide and Skin Types** 1.7.1 Macroscopic and microscopic methods 1.7.2 Grain patterns, follicle density, and cross-sectional features 1.7.3 Practical identification tools used in the leather industry			
Chapter Two: Preservation/ Curing of Hides and Skins				
3, 4	2.1 Physical chemistry of raw hides 2.2 Methods of curing 2.2.1 Drying techniques and moisture balance	Demonstration of drying and moisture assessment techniques	CLO4 CLO8	Raw hides (fresh and partially preserved)

	2.2.2 Salting methods and salt control mechanisms 2.2.3 Use of biocides and their environmental considerations 2.2.4 Radiation curing and advanced preservation techniques 2.3 Fresh stock management and temperature control for microbial prevention	Application of dry salting and wet salting processes Comparative trial using biocides on raw hides Observation of salt free eco-friendly preservation (case study/video/demo) Simulated preservation using fresh hide under temperature-controlled conditions (chilling)	CLO12 CLO1 CLO14	Salt (NaCl), drying trays, moisture meters Biocide chemicals and application brushes Weighing balance, storage containers, gloves, pH paper .
Chapter Three: Pre-Tanning Process and Operations				
5, 6	3.1 Introduction to beamhouse operations and significance in leather processing **3.2 Soaking** 3.2.1 Purpose and chemical principles of rehydration 3.2.2 Removal of salts, dirt, dung, and non-structural proteins 3.2.3 Soaking solution composition and	Soaking trials: traditional vs enzymatic; assessment of rehydration Practical demonstration of unhairing: sulfide vs enzyme-based methods Liming trial and swelling observation (pH, fiber opening)	CLO2 CLO4 CLO8	Surfactants and emulsifiers Degreasing enzymes (lipases) Solvent (if permitted under safety guidelines)

	conditions 3.2.4 Common defects during soaking and their remedies 3.2.5 Greener alternatives in soaking (low-salt, enzymatic soaking) **3.3 Unhairing** 3.3.1 Structure of hair and keratin 3.3.2 Hair burning vs hair saving methods 3.3.3 Chemical (lime/sulfide) and enzymatic unhairing 3.3.4 Oxidative, reductive, and acid unhairing systems 3.3.5 Environmental concerns and innovations in unhairing **3.4 Liming** 3.4.1 Purpose and swelling effect on collagen 3.4.2 Removal of interfibrillar substances and non-collagen proteins 3.4.3 Fiber splitting and mechanical effects	Deliming using ammonium salts and CO_2 (comparative demo) Bating trials with different enzyme types Pickling pH monitoring and salt-acid combinations Identification of common beamhouse defects and discussion of remedies Degreasing trial using surfactant-based and enzyme-based systems	CLO11 CLO12 CLO16	Sheepskin and bovine skin samples Beakers, extractor, grease filter paper, balance

	3.4.4 Variations in liming (chemical and biochemical), pH impact 3.4.5 Liming defects and corrective measures **3.5 Deliming** 3.5.1 Objectives and role of deliming agents 3.5.2 Common agents (ammonium salts, weak acids) 3.5.3 Alternative systems: CO_2 deliming, organic buffers 3.5.4 Role of deliming in enzyme preparation for bating 3.6 Bating 3.6.1 Enzymatic digestion of residual protein 3.6.2 Enzyme classification and factors affecting bating 3.6.3 Controlled bating for softness and grain quality **3.7 Degreasing**			

	3.7.1 Importance of degreasing in fatty skins (especially sheepskin) 3.7.2 Nature of natural fats and oils in hides 3.7.3 Degreasing agents: surfactants, solvents, and enzymatic options 3.7.4 Environmental concerns and process optimization 3.7.5 Impact on dyeing, fatliquoring, and softness **3.8 Pickling** 3.8.1 Purpose and necessity of pickling before mineral tanning 3.8.2 Acids used: sulfuric, formic, hydrochloric 3.8.3 Salt concentration, lyotropic swelling, and fiber protection 3.8.4 pH control and its influence on chrome uptake			
Chapter Four: Tanning Technologies				
7, 8	4.1 Introduction to tanning	Practical chrome tanning: float pH monitoring	CLO3	Chrome tanning salts (BCS),

	4.1.1 Definition and objectives of tanning 4.1.2 Principles of collagen stabilization and cross-linking 4.1.3 Historical evolution and classification of tanning systems 4.2 Chrome Tanning 4.2.1 Chemistry of basic chromium sulfate (BCS) 4.2.2 Chrome tanning mechanism and collagen interaction 4.2.3 Basification, masking agents, and pH control 4.2.4 Role of counterions, solvents, and zero-float tanning systems 4.2.5 Process innovations: non-aqueous floats, ethanolamine, hybrid chrome 4.3 Vegetable Tanning 4.3.1 Sources and classification of vegetable tannins 4.3.2 Chemistry of polyphenols and their bonding with collagen 4.3.3 Process control, penetration, and fixation	and shrinkage test Vegetable tanning trials using mimosa, quebracho, or chestnut extracts Combination tanning demo: syntan + chrome system Titanium and zirconium tanning experiments Tanning effectiveness comparison: shrinkage temp, penetration depth, color Observation of leather handle, fullness, and grain tightness Chrome exhaustion check and post-tan float analysis	CLO8 CLO10 CLO11 CLO14 CLO15	vegetable tannin extracts (mimosa, quebracho) Titanium and zirconium salts Synthetic tannins, glutaraldehyde, resin and polymer agents Drums or rotating vessels, thermometers, pH meter, shrinkage apparatus Beakers, filter papers, drying oven Personal protective equipment: gloves, masks, aprons

	behavior 4.3.4 Characteristics and uses of vegetable-tanned leathers 4.4 Synthetic and Combination Tanning 4.4.1 Syntans and resin tanning agents 4.4.2 Aldehyde tanning: glutaraldehyde, oxazolidine, etc. 4.4.3 Combination tanning systems: wet-white, wet-blue hybrids 4.4.4 Synergistic effects and commercial applications 4.5 Mineral and Miscellaneous Tannages 4.5.1 Titanium, zirconium, and iron tanning 4.5.2 Characteristics and performance of mineral-tanned leather 4.5.3 Novel systems: epoxy, isocyanate, multifunctional reagents 4.5.4 Zeolite-based and eco-friendly tannages 4.5.5 Nano composites as tanning agents			

Chapter 5: Post-Tanning Operations				
9, 10	5.1 Introduction to post-tanning operations 5.1.1 Importance of post-tanning in modifying and enhancing leather properties 5.1.2 Sequence of post-tanning steps in the leather processing workflow 5.2 Neutralization 5.2.1 Purpose of neutralizing residual acids 5.2.2 Common neutralizing agents and pH control 5.2.3 Influence on dyeing and fatliquoring 5.3 Retanning 5.3.1 Types of retanning agents: syntans, resins, vegetable extracts 5.3.2 Retanning strategies for softness, tightness, and fullness 5.3.3 Impact of retanning on grain, dye uptake, and final properties 5.4 Dyeing 5.4.1 Principles of dye penetration and fixation	Neutralization trial and pH monitoring Retanning with different agents: syntans, vegetable, resin Dyeing experiment: penetration test, shade variation, fixation behavior Fatliquoring application and softness comparison Drying trials: vacuum vs air drying Post-tanning defect identification and discussion Small project: prepare leather samples with different post-tan treatments and evaluate handle, softness, and color	CLO5 CLO8 CLO10 CLO12 CLO16	Neutralizing agents (sodium formate, bicarbonate) Retanning agents (syntans, vegetable tannins, resin dispersions) Acid and metal-complex dyes Fatliquors (natural, synthetic, sulphited oils) Leather samples (wet blue/wet white) Drying equipment (air dryer, vacuum dryer, toggle frame)

	5.4.2 Dye types (anionic, metal-complex, acid dyes) used in leather 5.4.3 Dyeing parameters: pH, temperature, float length 5.4.4 Problems in dyeing: streaks, poor penetration, shade variation 5.5 Fatliquoring 5.5.1 Role of oils and emulsions in leather softness and flexibility 5.5.2 Types of fatliquors: anionic, cationic, nonionic, synthetic, natural 5.5.3 Stability, penetration, and fixation of oils 5.5.4 Effect of under- or over-fatliquoring 5.6 Drying and Conditioning 5.6.1 Purpose and stages of drying 5.6.2 Methods: air drying, toggle drying, vacuum drying, paste drying 5.6.3 Importance of conditioning for final flexibility and dimensional stability 5.7 Functional Properties of Post-Tanned Leather			Spray bottles, measuring cylinders, pH meter, gloves

Chapter Six: Finishing Technologies				
11, 12, 13	6.1 Introduction to Leather Finishing 6.1.1 Purpose and significance of finishing in leather production 6.1.2 Classification: base coat, intermediate coat, top coat, lacquer finish 6.2 Finishing Materials and Formulations 6.2.1 Film-forming agents: binders (acrylics, polyurethanes) 6.2.2 Pigments, fillers, waxes, and plasticizers 6.2.3 Crosslinkers, adhesion promoters, and feel modifiers 6.3 Finishing Techniques and Application Methods 6.3.1 Mechanical methods: spraying, padding, roller coating, curtain coating 6.3.2 Manual methods: hand padding, buffing, brushing 6.3.3 Finishing machinery: spray booth, roller coater, buffing machines 6.4 Performance and Quality Evaluation	Preparation of base and top coat formulations Spray coating demonstration and finish buildup monitoring Roller coating application and comparison with manual techniques Flex resistance test (before and after finishing) Rub fastness and adhesion testing Comparison of water-based vs solvent-based finish effects Trial of nano or water-repellent finish on crust leather	CLO5 CLO8 CLO9 CLO10 CLO14 CLO16	Leather crust samples Finishing chemicals: acrylic/polyurethane binders, pigments, waxes, crosslinkers Finishing machines: spray booth, roller coater, buffing wheel Water-based and solvent-based formulations Nano-finishing agents or water repellents Rub fastness tester, flex tester, gloss meter

	6.4.1 Flex resistance, adhesion, rub fastness (dry/wet), and color uniformity 6.4.2 Grain retention, gloss, and feel evaluation 6.4.3 Influence of finish on breathability and mechanical properties 6.5 Novel and Smart Finishing Approaches 6.5.1 Water-based and solvent-free finishes 6.5.2 Nano-finishes and antimicrobial coatings 6.5.3 Digital printing on leather 6.5.4 Low-VOC and eco-certified finishing chemicals	Visual inspection for grain retention, evenness, and gloss		Hand tools: brushes, spatulas, pipettes, pH meter PPE: gloves, mask, lab coat
Chapter Seven: Cleaner Technologies and Innovations				
14, 15	7.1 Introduction to Cleaner Production in Leather Industry 7.1.1 Definition and importance of cleaner production 7.1.2 Key drivers: environmental regulations, consumer demand, sustainability goals 7.2 Cleaner Alternatives at Each Stage of Leather	Comparative experiment: enzyme vs chemical unhairing Ammonia free deliming demonstration (or case simulation) Chrome exhaustion and salt reduction analysis	CLO6 CLO7 CLO12 CLO13 CLO16	enzymatic soaking and unhairing kits Wet-blue and wet-white

	Processing 7.2.1 Beamhouse: enzymatic soaking, unhairing, CO_2 deliming 7.2.2 Tanning: chrome management, chrome-free systems (wet-white, zeolite, titanium) 7.2.3 Post-tanning: low-salt dyeing, sustainable fatliquors 7.2.4 Finishing: water-based, low-VOC, and solvent-free systems 7.3 Green Chemistry and Eco-friendly Materials 7.3.1 Biodegradable auxiliaries and surfactants 7.3.2 Bio-based syntans and renewable resource polymers 7.3.3 Alternatives to hazardous substances: aldehyde-free, formaldehyde-free 7.4 Biotechnology Applications in Leather Processing 7.4.1 Use of enzymes (proteases, lipases, amylases) in leather manufacturing 7.4.2 Microbial tanning concepts and fermentation-	Water-based vs solvent-based finishing assessment Biodegradability check of fatliquor samples Case study analysis: LWG-compliant cleaner process Audit simulation: beamhouse waste reduction project (group work) Use of digital tools to simulate process optimization or effluent control		samples Bio-based fatliquors, dyes, surfactants Finishing systems (solvent-free and water-based) LWG/ZDHC compliance documentation and audit forms Computers for digital simulation and AI model demonstration

	based auxiliaries 7.5 Artificial Intelligence (AI) and Digital Tools 7.5.1 Smart monitoring of effluent and chemical dosing 7.5.2 AI-assisted process optimization and defect prediction 7.5.3 Automation and digital traceability in cleaner leather production 7.6 Environmental Management and Global Standards 7.6.1 ZDHC, LWG, REACH, and ISO 14001 7.6.2 Carbon footprint, and wastewater treatment 7.6.3 Eco-labeling and compliance strategies for export markets			Projector, internet access for online regulatory tools Safety gear (gloves, goggles, lab coat)

7. Suggested texts and reference materials	
Text Books	1. Covington, A.D. (2009). Tanning Chemistry: The Science of Leather. Royal Society of Chemistry. 2. Sharphouse, J.H. (1989). Leather Technician's Handbook. Leather Producers' Association.

3. Heidemann, E. (1993). Fundamentals of Leather Manufacturing. Eduard Roether Verlag.
4. Khan, M.Q. (2003). Modern Technology of Leather Manufacture. Asia Pacific Business Press.
5. Sreeram, K.J. & Rao, J.R. (CLRI). Cleaner Technologies for Leather Sector.

Reference Books/Articles

1. Covington, A.D. (2021). Innovation in Leather Processing: A Review. Journal of the American Leather Chemists Association (JALCA).
2. Thanikaivelan, P., Rao, J.R., Nair, B.U., Ramasami, T. (2004). Progress in Leather Science and Biotechnological Applications. Trends in Biotechnology.
3. Kanagaraj, J., et al. (2006). Sustainable Leather Processing – India's Experience. Environmental Progress.

8. Assessment Methods

Type	Weight	Behavior and Criteria/ Assessment for Learning
Article/ book chapter/book review	20%	Critic review by students to be submitted to the instructor in written form; articles should not be of outdated ones!
Seminar Presentation	10%	*Each student is required to deliver a structured seminar presentation on a selected research topic. Evaluation will be based on content relevance, clarity, delivery, visual support (PPT), and response to questions from peers and instructors.*
Group assignment *or mini project applicable*	10%	*Different final course projects shall be given earlier immediately after three weeks of mid exam and students will work on and present before final exam and evaluated on group.*

Lab Practice report, and/or with Practical Exam	20%	*Students report shall be evaluated carefully and feedback shall be given on time. A practical exam shall be organized which the learner shall demonstrate individually and assessed accordingly*
Final semester Exam	40%	To be given at the end of course work and should cover the whole portion of the course
Total	**100%**	

9. Academic Honesty

Academic honesty is a core value of this program. Students are expected to produce original work, properly reference all sources, and strictly avoid plagiarism, fabrication, or any form of cheating. Academic integrity ensures fairness, promotes responsible scholarship, and builds a trustworthy academic environment. Violations of academic honesty will be subject to institutional disciplinary actions in accordance with university policies.

10. Submission of Assignments and Projects

All assignments, project works, and related submissions must be handed in to the course instructor or assigned personnel strictly according to the schedule provided. Late submissions without valid justification will be considered incomplete and may not be graded. Failure to submit required work on time may be reported as academic misconduct and affect the student's overall course performance.

11. Classroom Behavior and Professional Conduct

Students are expected to always demonstrate respectful and professional behavior. This includes punctuality, active participation, attentiveness, and respectful engagement with instructors and peers. Use of mobile phones and disruptive behavior during class are strictly prohibited. Maintaining a positive classroom environment enhances learning and reflects the professional standards expected in the leather and manufacturing industries.

12. Approval

Name	Signature	Date
Instructor:		

Section Head:		
Department Head:		

Table 5: Course profile for the soft skill course or courses without practice

FDRE TECHNICAL AND VOCATIONAL TRAINING INSTITUTE						
Faculty of Common Courses and computational Sciences			**Department of English**			
Program	B.Sc. in Building construction technology					
1. Instructor/s (teaching team members) Information						
Instructor Information			Other teaching team member information			
Name			Role	Teaching Assistant/ Technical Assistant		
Office Location			Name			
Phone Number			Office Location			
E-mail			Phone Number & Email			
Office Hours			Office Hours			
2. Course Information						
Course Name/Title	Communicative English Language Skills I					
Course Code	FLEn 1011					
Credit hours	3 Cr.Hrs /5 ECTS					
Work load	Lecture	Tutorial	Lab.	Home study	Assessment	Total
	48	------	------	77	10	135
Pre-requisite, and/or other restrictions	None					
Target group	1st Year Students					
Semester	Semester I					
Course of delivery	Semester based					
Status of the course	Common Course					
3. Course Description and Objectives						

Course Description:	Communicative English Skills I is a course designed to enable students to communicate in English intelligibly with acceptable accuracy, fluency and ability to use English appropriately in different contexts. The course exposes students to English language learning activities designed to help students use English for their academic and social needs. Students would be engaged in language learning development activities through doing and reflection on action. This includes grammar and vocabulary as used in communicative events and all skills and their sub-kills: speaking, listening, reading and writing. The language and skills are integrated where one becomes a resource to the other. There are six units covering topics related to the life world of students aswell as of societal relevance
Course objective:	At the end of this course, the learner will be able to: • Express themselves in social and academic events in English • Use English intelligibly with reasonable level of curacy and fluency • Listen and comprehend to talks related to social and academic events given in English • Read and understand texts written in English –texts on academic and social matters • Write in English as academically and socially desirable. • Learn and develop their English on their own—learning to learn: the language and the skills

4. Method of Instruction	
Class lectures	3 lecture hours every week • Active learning (involves the full participation of students) Conducting the lecture using deductive and inductive methods according to the natureof the topic provided.…
Tutorial	No tutorial
Study of lecture notes.	Student's responsibility
Individual assignment	The student shall perform the given assignment as per the schedule individually
Group Assignment	The student shall include him/her-self in a group, which comprises 3 to 5 membersorganized by the instructor to perform the assigned assignment and job together; Participate in the group work equally and share the responsibility equally.

5. Course Learning Outcomes	
5.1. Knowledge: - After the completion of this course the student will be able to:	
CLO1	expand vocabulary
CLO2	Reflect on the relevance of a lesson
CLO3	Discuss different type of tenses

CLO4	identify active and passive voices
CLO5	differentiate types of conditional sentences
5.2. Practical skills	
CLO6	talk about personal background in English
CLO8	take lecture notes by listening to a talk;
CLO9	give advice in English;
CLO10	read and make notes;
CLO11	read an article and answer questions;
CLO12	write reflections in the form of paragraph
CLO13	listen and take notes;
CLO14	write a paragraph about a lesson;
CLO15	use conditional sentences
CLO16	revise a paragraph based on feedback;
CLO18	write a short summary from notes taken from a lecture
CLO19	change active voice into passive voice and vice versa
CLO20	guess the meanings of new words from context;
5.3. Attitude	
CLO21	have positive attitude towards self-development
CLO22	respect the campus community and uphold ethical principles

6 Mapping of the course Learning Outcomes to the program Learning Outcomes, Teaching Methods, and Assessment:

	Program Learning Outcomes (PO)																
Course Learning Outcomes (CLO)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO10	……	Training method			Assessment method		
											I	I		FT	MT	CASS
CLO1																
CLO2																
CLO3																
CLO4																
CLO5																
CLO6																
CLO8																

CLO9																
CLO10																
CLO11																
CLO12																
CLO13																
CLO14																
CLO15																
CLO16																
CLO18																
CLO19																
CLO20																
CLO11																
CLO22																

7. Detail Course Outline

Unit	Week	Topics to be covered (Lecture hours)	Learning Outcomes	Assignments/activity (Tutorial hours)
Unit One Study skills	1	**.1. Speaking Activity** Introducing oneself (who you are, where you came from, where you finished your primary and secondary school), what you intend to study and why	CLO1 CLO2 CLO6	Short lectures, pair and group work, Discussions, Presentations about self
		1.2. Listening Activity Taking lecture notes by listening to a talk	CLO7 CLO2 CLO1 CLO12	Short lectures pair and group work,Discussions, Independent learning
		.3. Grammar Activity Modals - Giving advice usingappropriate language	CLO6 CLO8 CLO1 CLO2	Short lectures, pair and group work, Discussions, Independent learning Presentation

				Role-play
	2	**1.4. Grammar** **Activity** Use the present perfect tense properly	CLO5 CLO2 CLO3	Short lectures pair and group work, Discussions, Independent learning
		1.5. Writing **Activity** Write a paragraph about your reading experience	CLO11 CLO13 CLO2 CLO60	Short lectures pair and group work,Discussions, Independent writing
	3	**1.6. Reading** **Activity** o Identify the various purposes of reading	CLO6 CLO13 CLO10 CLO2	Short lectures pair and group work,Discussions, Independent learning
		1.7. Activity Two o Read and make note	CLO1 CLO11 CLO6 CLO9	Short lectures pair and group work,Discussions, Independent learning
Unit Two Health and fitness	4	**2.1 Listening** **Activity** o Listen and take notes from a story	CLO12 CLO7 CLO2 CLO1.	Short lectures, pair and group work, Discussions, Presentations, Independent learning(e.g. independent reading)
		2.2 Reading **Activity** o Skimming: read and identify main idea of a text	CLO6 CLO13 CLO10 CLO2	Short lectures pair and group work,Discussions, Independent writing
		2.3 Writing **Activity**	CLO11 CLO13 CLO2	

	5	) Write a paragraph describing the lessonsyou have learnt about health and fitness	CLO6	
		.4 Grammar **Activity** o Identify and write conditional sentence	CLO14 CLO5 CLO3 CLO2	Short lectures pair and group work,Discussions, Independent learning
	6	**2.5 Speaking** **Activity** o Discuss in English health and fitness	CLO1 CLO2 CLO6 CLO7 CLO63	Short lectures, pair and group work, Discussions, Presentationsabout self
		.6 Vocabulary **Activity** o guess the meanings of new words from context	CLO1 CLO6	Short lectures, pair and group work, Discussions guessing meaning
Assessment	7	Mid exam All topics covered in Unit One and Two	Result	Formative and summativeevaluation
Unit Three Cultural Values	8	**3.1 Speaking** **Activity** converse in English about culture andcultural values	CLO21 CLO22 CLO6 CLO6 CLO2	Short lectures, pair and group work, Discussions, Presentations aboutcultures
		.2 Listening **Activity**) listen to a lecture and identify specific information) make notes while listening to a lecture	CLO7 CLO12 CLO2 CLO1 CLO3	Reading the notes Pair and group work Learning individual
		.3 Grammar **Activity**) use simple present, simple past, present perfect and past perfect tenses in writing develop or choose strategies for	CLO5 CLO3.	Short lectures, pair and group work,Discussions

	9	learning grammar independently		
		3.4 Writing Activity o Write a paragraph about your reading experience o revise a paragraph	CLO11 CLO13 CLO2 CLO6	Short lectures pair and group work, Discussions, Independent writing (eg. Writing about self- reading experience
	10	**3.5 Reading Activity** o read an article and answer comprehension questions	CLO3 CLO13 CLO10 CLO2	pair and group work,Discussions, Independent learning
Unit Four Wild Life	11	**4.1 Speaking Activity** o interact in English using written notes and answers to exercises	CLO1 CLO2	Short lectures pair and group work, Discussions, speaking based on the given notes
		Part II: Listening Activity o listen to a talk and take notes;	CLO7 CLO12 CLO2 CLO3	Reading the notes Pair and group work Learning individual
	12	**4.2 Vocabulary Activity** o explain and use the denotative and connotative meanings of words	CLO1 CLO2 CLO3	Short lectures, pair and group work,Discussions guessing meaning
		4.3 Writing Activity	CLO11 CLO13 CLO6	Short lectures pair and group work,Discussions,

		o make notes while reading;	CLO2	Independent writing
	13	**4.4 Reading Activity** o predict the content of a reading text	CLO12 CLO7 CLO3	Short lectures pair and group work, Discussions, Independent predicting
Unit Five Population	14	**.1 Part I: SpeakingActivity** o interact in English using notes, summaries and answers to exercises;	CLO1 CLO2 CLO6	Short lectures pair and group work, Discussio ns speaking
		.2 Part II: ListeningActivity o write relevant and effective notes while you listen and read		Short lectures pair and group work,Discussions Listening practice
		5.3 Part III: Vocabulary Activity: use the collocations of "population" in your talk or writing;		Short lectures pair and group work,Discussions on vocabulary
	15	**4 Part IV: WritingActivity** o read and summarize an article	Result	Submissi on Evaluati on
		5.5 Part V: Grammar **Activity:** construct sentences in active and passive voices		Short lectures pair and group work, Discussions on grammar
Final examination	16	All topics covered from Unit three up to Unit Five	Result	summative evaluation

8. Suggested texts and reference materials

Text Book	1. Department of Foreign Language and Literature. 1996. College English (Volume I and Volume II). Addis Ababa University Press.

Reference Books

1. Alfassi, M. 2004. Reading to learn: Effects of combined strategy instruction on high school students Journal of Educational Research 97(4):171184
2. Anderson, N. 1999. Exploring second language reading: Issues and strategies. Toronto: Heinle & Heinle Publisher.
3. Bade, M. 2008. Grammar and good language learners. In C. Griffiths (Eds.). Lessons from good language learners (pp. 174-184). Cambridge University Press https//doi.org/10.107/CBO9780511497667.016.
4. Bouchard, M. 2005. Reading comprehension strategies for English language learners: 30research-based reading strategies that help students read, understand
5. and really learn content from their textbooks and other nonfiction materials New York: Scholastic
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9. Assessment methods

Type	Weight	Behavior and Criteria/ Assessment for Learning
Active Participation	5%	Develop interaction ability in pair , group and classroom context

Written test	10%	Develop writing skill
Individual Assignment (portfolio)	5%	Self-reflection based on the topics given on various topics indicated in Chapter One and Chapter Two
Mid examination	25%	Self-awareness on interaction and writing activities
Oral presentation	5%	Public speaking ability
Final semester Exam	50%	Self and environmental awareness based on the topics found from Chapter Three up to Chapter Five
Total	100%	

10. Academic Honesty:

In all cases i.e. in performing assignments, project works and examinations, copying from others and using others' work as own is considered cheating which is forbidden by the academic principles and regulation of the institute. Failure to comply with regulations, will lead to disciplinary action starting from canceling the results of the assignments, project works, and examination up to dismissal

11. Submitting Date

All assignments and project works should be submitted to the instructor according to the timetable provided. All assignments and project works results will be invalid if they are not submitted on time and will be reported to the concerned body as misconduct of the student.

12. Classroom Behavior

Classroom discipline is indispensable for healthy teaching learning process. Therefore, it is every student's responsibility to avoid disturbing behavior and activities in the classroom. Switching off the cell phone is vital in the class. Students who fail to comply will be subject to disciplinary measures

13. Approval

Name	Signature	Date
Instructor:		
Section Head:		
Department Head:		

9. Quality Management System Institutionalized mechanisms for monitoring, evaluating, and continuously improving curriculum quality, relevance, and delivery effectiveness.

Annex 4: PO and Course Mapping Summary

Courses	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Phil1012- Logic and Critical Thinking		√	√			√						
Psyc1011 -General Psychology				√					√	√		√
FLEn1011 - Communicative English Language Skill – I										√		
GeES1005 - Geography of Ethiopia and The Horn		√				√	√		√			√
Math1007 - Mathematics (For Natural Science)	√	√										
Phys1001 - General Physics	√	√		√								
SpSc1001 - Physical Fitness						√	√		√	√	√	√
EmTe 1112 - Introduction to Emerging Technology					√	√	√	√			√	√
Entr.1106 – Entrepreneurship										√	√	√
Anth1011 – Social Anthropology			√			√	√		√			
FLEn 1012 - Communicative English Language Skill-II										√		

Courses		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Math1102 - Applied Mathematics I		√	√										
MCiE1012 - Moral and Civic Education		√	√				√			√			
INCL1010- Inclusiveness					√					√			√
MEng2101	Engineering Drawing					√				√	√		
Comp2103	Introduction to computer programing	√				√				√			
CEng2105	Engineering Mechanics I	√	√	√									
Math2101	Applied Mathematics II	√	√										
Econ2009	Economics	√	√	√	√	√		√					
xxxx2011	Global Trend						√	√		√		√	
MEng2102	Engineering Mechanics II	√	√	√	√								√
MEng2104	Strength of Materials I	√	√	√	√	√							
Math2142	Applied Mathematics III	√	√										
MEng2106	Engineering Thermodynamics I	√	√										

Courses		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
MEng2108	Basic Workshop Practice	√	√			√							
MEng2110	Machine Drawing with CAD	√				√				√	√		
MEng3101	Engineering Thermodynamics II	√	√										
MEng3103	Strength of Materials II	√	√	√	√								
ECEg3101	Basic Electricity and Electronics	√	√	√	√	√							
MEng3105	Engineering Materials	√	√										
MEng3107	Fluid Mechanics I	√	√	√		√							
Hist2002	History of Ethiopia and the Horn		√		√		√		√	√			
MEng3102 - IC Engines		√	√		√	√		√					
MEng3104	Introduction to Numerical methods and FEM	√	√										
MEng3106	Machine Elements I	√	√	√	√								
MEng3108	Manufacturing Process	√		√	√								
MCEg3110	Introduction to Mechatronics	√	√	√									

Courses		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
MEng3112	Fluid Mechanics II	√	√	√	√	√				√			√
MEng4101	Machine Elements II	√	√	√	√	√							
MEng4103	Heat Transfer	√	√	√									
MEng4105	Fluid Power Systems	√	√			√				√			
ECEg4107	Electrical Power and Machines	√	√			√				√			
IETP4115	Integrated Engineering Team Project												
MEng4102	Material Handling Equipment	√	√										
MEng4404	Computer Integrated Manufacturing	√	√	√		√							
MEng4106	Motor Vehicles Engineering	√	√		√								
MEng4606	Turbomachinery I	√	√	√									
MEng4110	Refrigeration and Air Conditioning	√	√	√			√						
MEng4114	Industrial Internship			√					√		√		
MEng5101	Power Plant Engineering	√	√			√							√

Courses		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
MEng5103	Mechanical Vibration	√	√	√		√							
MEng5105	Maintenance of Machinery	√	√		√	√	√					√	
MEng5607	Turbomachinery II	√	√	√									
MEng5309	Heavy Duty and Construction Equipment	√	√	√	√								
MEng5111	Integrated Design Project	√			√					√	√		√
MEng5113	Final Year Project Phase I	√	√	√	√	√			√	√	√	√	√
IEng5102	Industrial Management and Engineering Economy	√			√		√						
MEng5104	Measurement and Instrumentation	√	√			√				√			
MEng5106	Control Systems Engineering	√	√	√	√	√							
MEng5108	Final Year Project Phase II	√	√	√	√	√	√	√	√	√	√	√	√
MEng4108	Turbomachinery	√	√	√									
MEng4310	Automotive Electrical Systems	√	√	√	√								
MEng5305	Automotive Electronics Systems	√	√	√	√	√							

Courses		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
MEng5307	Fleet and Transport Management	√	√		√	√							
MEng5311	IC Engines and Motor Vehicles Lab				√	√	√	√					
MEng5308	Automotive Maintenance	√	√	√	√								√
MEng5411	Engineering Measurement and Metrology	√	√			√							
MEng4406	Metal Casting Process	√			√	√							
MEng4402	Machining Technology	√		√			√				√		
MEng4408	Metal Forming Technology	√		√	√		√				√		
MEng5403	Welding Technology	√		√		√	√						
MEng5405	Tool and Die Design and Manufacturing	√	√										
MEng5404	Modern Manufacturing Technology	√				√							
IEng4110	Total Quality Management	√	√										
MEng5501	Product Design and Development	√	√			√					√		
MEng5503	Introduction to Tribology	√	√	√	√			√					

Courses		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
MEng5505	Rotor Dynamics	√	√	√	√								
MCEg5504	Introduction to Robotics and Automation	√		√		√				√			
MEng4602	Renewable Energy Systems	√	√	√									
MEng5603	Thermo-Fluid System Design	√	√				√			√			
MEng5601	Energy Auditing and Management	√	√	√									√
MEng5606	Gas Turbines and Jet Propulsion	√	√			√		√					
Indicate the relation between the course and PO by ticking “√”on the appropriate box													