NED University of Engineering and Technology

Department of TEXTILE ENGINEERING

Bachelor of Engineering in TEXTILE

DEPARTMENTAL OUTCOME BASED EDUCATION (OBE) FRAMEWORK

Batch 2021 and Onwards

Contents

1. Vision Statement

a. University Vision

Be a leader in enabling Pakistan's social and economic transformation.

b. Department Vision

To produce textile engineers known for their technical excellence, leadership qualities & ethical values, so they may contribute profoundly to the society and to the profession

2. Mission Statement

a. University Mission

Acquire education and research excellence in engineering and allied disciplines to produce leadership and enabling application of knowledge and skills for the benefit of the society with integrity and wisdom.

a. Programme Mission

To provide comprehensive knowledge in the textile engineering discipline through a well-designed curriculum while teaching them professional and ethical values so as these graduates will be capable of fulfilling the needs of the industry and the society

3. Program Educational Objectives (PEOs)

The Textile Engineering program at the Department of Textile Engineering produces graduates who will be having the:

PEO-1: Sound technical knowledge in Textile engineering, mathematics and management that will lead to success in a broad range of career opportunities, and graduate education.

PEO-2: Ability to successfully apply critical thinking to solve contemporary issues and engineering challenges in their professional life.

PEO-3: Effective written, verbal and visual communication skills to disseminate ideas to the team members, customers and interdisciplinary personnel.

PEO-4: Awareness of ethical, legal and professional obligations so they as may contribute for the sustainable development of the environment and society

PEO-5: Lifelong learning and continuous self-improvement by pursuing higher education and professional developmental courses

4. Mapping of PEOs to University and Departmental Vision and Mission

Vision and Mission		Program Educational Objectives (PEOs)				
		PEO-1	**PEO-2**	**PEO-3**	**PEO-4**	**PEO-5**
University Vision	Be a leader[1-3] in enabling Pakistan's social[4] and economic transformation[1, 5].	✓	✓	✓	✓	✓
University Mission	Acquire education and research excellence[5] in engineering and allied disciplines to produce leadership[1-2] and enabling application of knowledge[3] and skills[3] for the benefit of the society[4] with integrity and wisdom.	✓	✓	✓	✓	✓
Department's Vision	To produce textile engineers known for their technical excellence[1-2], leadership qualities[3] & ethical values[4], so they may contribute profoundly to the society[4] and to the profession[5]	✓	✓	✓	✓	✓
Programme's Mission	To provide comprehensive knowledge[1-2] in the textile engineering discipline through a well-designed curriculum while teaching them professional[3-4] and ethical values[4] so as these graduates will be capable of fulfilling the needs of the industry[5] and the society[4]	✓	✓	✓	✓	✓

5. Program Learning Outcomes (PLOs)

PLO-1 Engineering Knowledge: An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PLO-2 Problem Analysis: An ability to identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PLO-3 Design / Development of Solutions: An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PLO-4 Investigation: An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions.

PLO-5 Modern Tool Usage: An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations.

PLO-6 The Engineer and Society: An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.

PLO-7 Environment and Sustainability: An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

PLO-8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PLO-9 Individual and Teamwork: An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.

PLO-10 Communication: An ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PLO-11 Project Management: An ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.

PLO-12 Lifelong Learning: An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

6. Mapping of PLOs to PEOs

Program Learning Outcomes (PLOs)	Program Educational Objectives (PEOs)				
	PEO-1	PEO-2	PEO-3	PEO-4	PEO-5
PLO 1: Engineering Knowledge	✓				
PLO 2: Problem Analysis		✓			
PLO 3: Design / Development of solutions		✓			
PLO 4: Investigation		✓			
PLO 5: Modern Tool Usage	✓				
PLO 6: The Engineer and Society				✓	
PLO 7: Environment and Sustainability				✓	
PLO 8: Ethics				✓	
PLO 9: Individual and Team Work			✓		
PLO 10: Communication			✓		
PLO 11: Project Management	✓				
PLO 12: Lifelong Learning					✓

7. Scheme of Studies

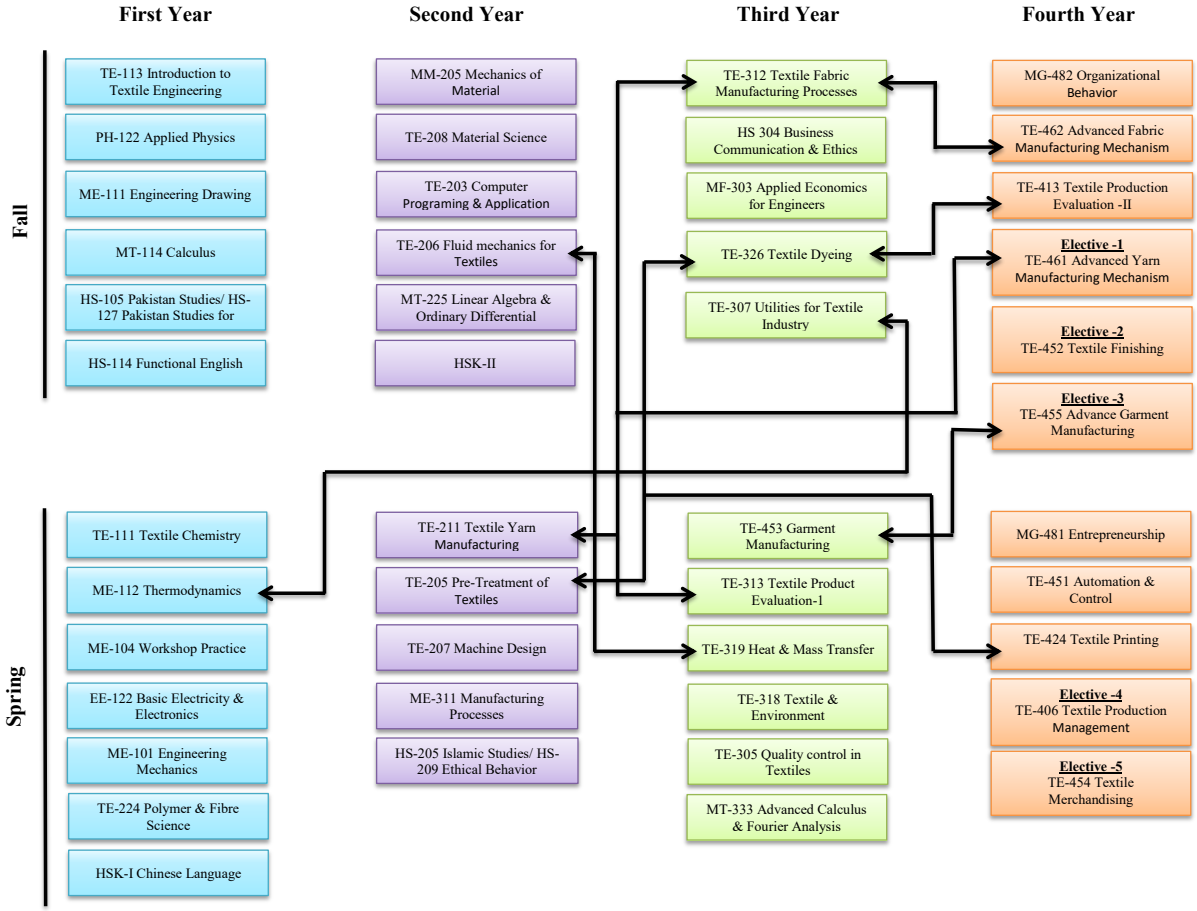
TEXTILE Engineering									
First Year									
Fall Semester					**Spring Semester**				
Course Code	**Course Title**	**Credit Hrs**			**Course Code**	**Course Title**	**Credit Hrs**		
		Th	**Pr**	**Total**			**Th**	**Pr**	**Total**
TE-113	Introduction to Textile Engineering	2	0	2	TE-111	Textile Chemistry	3	1	4
PH-122	Applied Physics	3	1	4	ME-112	Thermodynamics	3	0	3
ME-111	Engineering Drawing	2	1	3	ME-104	Workshop Practice	0	2	2
MT-114	Calculus	3	0	3	EE-122	Basic Electricity & Electronics	3	0	3
HS-105	Pakistan Studies OR	2	0	2	ME-101	Engineering Mechanics	3	1	4
HS-127	Pakistan Studies for Foreigners				TE-224	Polymer & Fibre Science	2	0	2
HS-114	Functional English	2	0	2	HSK-1	Chinese Language	NC		
Total		**14**	**2**	**16**	**Total**		**14**	**4**	**18**
Second Year									
Fall Semester					**Spring Semester**				
Course Code	**Course Title**	**Credit Hrs**			**Course Code**	**Course Title**	**Credit Hrs**		
		Th	**Pr**	**Total**			**Th**	**Pr**	**Total**
MM-205	Mechanics Of Material	3	1	4	TE-211	Textile Yarn Manufacturing	3	1	4
TE-208	Material Science	2	1	3	TE-205	Pre-Treatment Of Textiles	3	1	4
TE-203	Computer Programming & Application	2	1	3	TE-207	Machine Design	3	0	3
TE-206	Fluid Mechanics for Textiles	2	1	3	ME-311	Manufacturing Processes	3	1	4
MT-225	Linear Algebra & Ordinary Differential Equations	3	0	3	HS-205	Islamic Studies Or	2	0	2
HSK-II	Chinese Language	NC			HS-209	Ethical Behavior			
	-				HS-200	Community Service	NC		
Total		**12**	**4**	**16**	**Total**		**14**	**3**	**17**
Third Year									
Fall Semester					**Spring Semester**				

TEXTILE Engineering									
Course Code	**Course Title**	**Credit Hrs**			**Course Code**	**Course Title**	**Credit Hrs**		
		Th	**Pr**	**Total**			**Th**	**Pr**	**Total**
TE-312	Textile Fabric Manufacturing Processes	3	1	4	TE-453	Garment Manufacturing	3	0	3
TE-307	Utilities for Textile Industry	3	1	4	TE-313	Textile Product Evaluation-1	3	1	4
MF-303	Applied Economics for Engineers	3	0	3	TE-319	Heat & Mass Transfer	2	1	3
TE-326	Textile Dyeing	3	1	4	TE-318	Textile & Environment	2	0	2
HS-304	Business Communication & Ethics	3	0	3	TE-305	Quality control in Textiles	2	0	2
	-				MT-333	Advanced Calculus & Fourier Analysis	3	0	3
Total		**15**	**3**	**18**	**Total**		**15**	**2**	**17**
Final Year									
Course Code	**Course Title**	**Credit Hrs**			**Course Code**	**Course Title**	**Credit Hrs**		
		Th	**Pr**	**Total**			**Th**	**Pr**	**Total**
MG-482	Organizational Behavior	3	0	3	MG-481	Entrepreneurship	3	0	3
TE-462	Advanced Fabric Manufacturing Mechanism	3	1	4	TE-451	Automation & Control in Textiles	3	0	3
	Elective 1	3	1	4		Electives 2	3	0	3
*TE-408	Textile Engineering Design Project	0	3	3	*TE-408	Textile Engineering Design Project	0	3	3
TE-413	Textile Production Evaluation -II	3	1	4	TE-424	Textile Printing	3	1	4
Total		**12**	**6**	**18**	**Total**		**12**	**4**	**16**
* Duration one academic year: Requires literature survey and preliminary work during this Semester									

ELECTIVES

Course Code	Course Title	Credit Hrs			Course Code	Course Title	Credit Hrs		
		Th	Pr	Total			Th	Pr	Total
TE-461	Advanced Yarn Manufacturing Mechanism	3	1	4	TE-406	Textile Production Management	3	0	3
TE-452	Textile Finishing	3	1	4	TE-454	Textile Merchandising	3	0	3
TE-455	Advance Garment Manufacturing	3	1	4		-			

Textile Engineering Department Course Dependency Chart



8. Mapping of Curriculum to PLOs

Textile Engineering Courses			Program Learning Outcomes (PLOs)										
			PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10	PLO-11	PLO-12
First Year	Fall	TE-113 Introduction to Textile Engineering	C1	C4							C2			
		PH-122 Applied Physics	C2, P3	C3, C3										
		ME-111 Engineering Drawing	C2 P3				P3					C3		P4
		MT-114 Calculus	C1	C3, C2										
		HS-105 Pakistan Studies OR HS-127 Pakistan Studies (for Foreigner)						C2 C2						C2 C2
		HS-114 Functional English										A3, C2, C6		
	Spring	TE-111 Textile Chemistry	C1						C4					C3
		ME-112 Thermodynamics	C2	C3 C4										
		ME-104 Workshop Practice				P3 P3		A4			A4			
		EE-122 Basic Electricity & Electronics	C2 C2		C3									
		ME-101 Engineering Mechanics	C1	C3 C3		P1								
		TE-224 Polymer & Fiber Science	C3			C5								
Second Year	Fall	MM-205 Mechanics of Material	C3		C4		C3				P3			
		TE-208 Material Science	C1	C4	C3									
		TE-203 Computer Programming & Applications	C2				C6							
		TE-206 Fluid Mechanics for Textiles		C2		C3	P3							
		MT-225 Linear Algebra & Ordinary Differential Equations	C2	C3										
		HS-200 Community Service						A3						A2
	Spring	TE-211 Textile Yarn Manufacturing Processes	C2			P2							C5	
		TE-205 Pre-treatment of Textiles	C2	C2		P3								
		TE-207 Machine Design	C2		C5 C5									
		ME-311 Manufacturing Processes	C2 C2 C2 C2			P3								
		HS-205 Islamic Studies OR ethical behavior								C2, C2				
Third Year	Fall	TE-312 Textile Fabric Manufacturing Processes	C1	C4	C2	P2								
		TE-307 Utilities for Textile Industry	C2	C4		P3			C4					
		MF-303 Applied Economics for Engineers		C4				C2						
		TE-326 Textile Dyeing	C2		C3	P3			C6					
		HS-304 Business Communication & Ethics								C3		A3, C6		
	Spring	TE-453 Garment Manufacturing	C1						C3				C4	
		TE-313 Textile Product Evaluation-I	C2	C1	C3	P3								
		TE-319 Heat and Mass Transfer		C2	C3	C2	P3							
		TE-318 Textile & Environment		C4	C6				C1					

		Textile Engineering Courses	Program Learning Outcomes (PLOs)											
			PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10	PLO-11	PLO-12
		TE-305 Quality Control in Textiles	C3	C4							C3			
		MT-333 Advanced Calculus & Fourier Analysis	C2	C3, C3										
Fourth Year	Fall	MG-482 Organizational Behavior						C4			A3			C2
		TE-462 Advanced Fabric Manufacturing Mechanism		C4	C4	P3							C4	
		*TE-461 Advanced Yarn Manufacturing Mechanisms	-	-	-	-	-	-	-	-	-	-	-	-
		*TE-455 Advanced Garment Manufacturing	-	-	-	-	-	-	-	-	-	-	-	-
		*TE-452 Textile Finishing	-	-	-	-	-	-	-	-	-	-	-	-
		TE-408 Textile Engineering Design Project		C	C				C	A	A	A	A	
		TE-413 Textile Product Evaluation – II		C5	C4	P3								
	Spring	MG-481 Entrepreneurship								A3			C3	C2
		TE-451 Automation & Control in Textiles	C3		C3	C4								
		**TE-406 Textile Production Management	-	-	-	-	-	-	-	-	-	-	-	-
		**TE-454 Textile Merchandising and Management	-	-	-	-	-	-	-	-	-	-	-	-
		TE-408 Textile Engineering Design Project		C	C					A	C,A	C,A	C	C
		TE-424 Textile Printing	C3	C5		P3								
		Internship feedback	C	C				A		A	A	A		
		* Elective – 1 ** Elective – 2												
		Chances						6	6	6	8	6	6	7

9. Key Performance Indicators (KPIs)

		Evaluation Tool	KPI	Data Collection Frequency	Analysis Frequency
PEO	Programme	▪ Employer Feedback Survey ▪ Alumni Feedback Survey ▪ Employment Statistics	50% of the Survey Form responses must attain a score of 3 or above (on a scale of 1 to 5), and 50% of the graduates must be employed and/or engaged in higher studies.	Every Year	4 years from graduation
PLO	Student	▪ CLO scores of the student in the mapped course(s)	Each PLO must be attained in at least 50% of the respective mapped course(s), with an average score of at least 50%.	Every Semester	Every Semester
	Course	▪ PLO scores of all the students in the mapped course	At least 50% of the students must attain that PLO	Every Semester	Every Semester
	Programme	▪ Final PLO attainment statistics of all the courses including FYDP ▪ Internship Feedback Form ▪ Exit Survey	At least 50% of the mapped courses must attain the PLO and at least 50% of the students/ responses must attain a score of 3 or above on a scale of 1 to 5.	At graduation	At graduation
CLO	Student	▪ Course work	The student must obtain at least 50% average percentage score from all attempts.	Every Semester	Every Semester
	Course	▪ CLO scores of all students in the course	At least 50% of the students must attain that CLO	Every Semester	Every Semester

10.Continuous Quality Improvement (CQI)

The following table shows the post KPI evaluation actions, severity-wise, as outlined in the Manual of Uniform OBE Framework.

	PEO CQI	PLO CQI			CLO CQI	
	Program KPI	**Student KPI**	**Course KPI**	**Programme KPI**	**Student KPI**	**Course KPI**
KPIs Achieved	▪ No Action	▪ No Action	▪ No Action	▪ No Action	▪ No Action	▪ No Action
KPIs Not Achieved	1. Review of curriculum strategies. 2. Review of assessment methods. 3. Review of the relevant KPIs. 4. Review of PEOs. 5. Revisions implemented.	1. Warning through the progressive attainment sheet. 2. Student counselling.	1. Review of teaching and learning process. 2. Review of CLOs assessment methods. 3. Review of CLO-PLO mapping and the relevant KPIs. 4. Review of curriculum design. 5. Revisions implemented.	1. Review of teaching and learning process. 2. Review of PLOs assessment methods. 3. Review of Course-PLO mapping and the relevant KPIs. 4. Review of curriculum design. 5. Revisions implemented.	1. Student provided further chances through direct assessment tools. 2. Student counselling.	1. Review of CLO assessment methods. 2. Review of CLOs and taxonomy levels. 3. Review of students' course feedback. 4. Review of CLO KPIs. 5. Faculty advice by Departmental OBE Cell. 6. Faculty training.

The following figure shows the overall OBE framework for an Engineering Programme as outlined in the Manual of Uniform OBE Framework.