Curriculum of Diploma Programme

in

Computer Aided Costume Design & Dress Making

Department of Science, Technology and Technical Education (DSTTE), Govt. of Bihar

State Board of Technical Education (SBTE), Bihar

Semester – I
Teaching & Learning Scheme

Course Codes	Category of course	CourseTitles	Teaching & Learning Scheme (Hours/Week)					
			Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
			L	T				
2450101	**PCC**	**Dress Design Fundamentals**	03	-	04	02	09	06
2450102	**PCC**	**Figure & Garment Sketching** (FCT, CACDDM)	03	-	04	02	09	06
2400103C	**ASC**	**Applied Chemistry –C** (TE, CACDDM, GT, FCT)	03	-	04	02	09	06
2400105D	**ASC**	**Applied Mathematics –D** (CACDDM, FCT, TE, GT, FPP)	02	01	-	02	05	04
2450106	**PCC**	**Workshop Practice for Tailoring and Fashion Design**	-	-	04	02	06	03
2418107	**BCC**	**ICT Tools** (CE, ME, ME (Auto), FTS, CSE, AIML, MIE, CRE, CHE, FPP, TE, CACDDM, GT)	-	-	04	02	06	03
2400008	**NRC**	**Sports, Yoga and Meditation** (Common for All Programmes)	-	-	01	01	02	01
2400110	**NRC**	**Community/ Society Development** (AIML, AE, CSE, ELX (R), CHE, EE, ME, ME (Auto), MIE, FTS, CACDDM, FPP)	01	-	-	-	01	01
Total			**12**	**1**	**21**	**13**	**47**	**30**

Note: Prefix will be added to course code if applicable (T for Theory Paper, P for Practical Paper and S for Term Work)

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts).

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies).

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.).

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

Semester - I

Assessment Scheme

Course Codes	Category of course	Course Titles	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
			Theory Assessment (TA)		Term work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		
			Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2450101	**PCC**	**Dress Design Fundamentals**	30	70	20	30	20	30	200
2450102	**PCC**	**Figure & Garment Sketching** (FCT, CACDDM)	30	70	20	30	20	30	200
2400103C	**ASC**	**Applied Chemistry -C** (TE, CACDDM, GT, FCT)	30	70	20	30	20	30	200
2400105D	**ASC**	**Applied Mathematics -D** (CACDDM, FCT, TE, GT, FPP)	30	70	20	30	-	-	150
2450106	**PCC**	**Workshop Practice for Tailoring and Fashion Design**	-	-	20	30	20	30	100
2418107	**BCC**	**ICT Tools** (CE, ME, ME (Auto), FTS, CSE, AIML, MIE, CRE, CHE, FPP, TE, CACDDM, GT)	-	-	20	30	20	30	100
2400008	**NRC**	**Sports, Yoga and Meditation** (Common for All Programmes)	-	-	10	-	06	09	25
2400110	**NRC**	**Community/ Society Development** (AIML, AE, CSE, ELX (R), CHE, EE, ME, ME (Auto), MIE, FTS, CACDDM, FPP)	25	-	-	-	-	-	25
Total			**145**	**280**	**130**	**180**	**106**	**159**	**1000**

Note: Prefix will be added to course code if applicable (T for Theory Paper, P for Practical Paper and S for Term Work)

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

A) Course Code : 2450101 (T2450101/P2450101/S2450101)

B) Course Title : Dress Design Fundamentals

C) Pre- requisite Course(s) :

D) Rationale :

This course is designed to develop artistic aptitude in students to sustain themselves in the field of garment/fashion design. It helps in developing the basic foundation that is essential for apparel design and garment production. The focus of the course is on development of skills in the students to apply principles and elements of design for apparel design in industry.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/ laboratory/ workshop/ field/ industry.

After completion of the course, the students will be able to-

CO-1 Use tools and media for drawing.
CO-2 Apply elements of design for drawings and sketches.
CO-3 Apply principles of design in drawing using appropriate elements of design.
CO-4 Create structural and applied design using proper elements and principles of design.
CO-5 Create reduction and enlargement of design.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Program Outcomes(POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	-	-	-	-	-	2		
CO-2	3	2	2	2	2	2	2		
CO-3	3	2	2	2	2	2	2		
CO-4	3	2	2	2	2	2	3		
CO-5	3	2	2	2	2	2	3		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	**T**				
2450101	Dress Design Fundamentals	03	-	04	02	09	06

Legend:

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H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment(LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2450101	Dress Design Fundamental	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

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TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

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I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2450101

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 1a. Define drawing media and Tool. *TSO 1b.* List drawing media and Tool. *TSO 1c.* Identify drawing media and Tool. *TSO 1d.* Explain drawing media and Tool.	**Unit- 1.0 Tools and Media Materials used for Drawing** 1.1 Drawing tools such as T-square, set-square, drawing-board, compass and measure accurately with a ruler. 1.2 Media such as various grades and points of pencil and eraser, charcoal, pen, brush drawing, ink and wash, chalks, crayons, coloured pencils and felt-tip pens.	**CO1**
TSO 2a. Identify elements of design. *TSO 2b.* List elements of design. *TSO 2c.* Explain elements of design. *TSO 2d.* Apply elements of design on garment.	**Unit-2.0- Elements of Design** 2.1 Line: Definition and concept of line, types of line (Horizontal, Vertical, Diagonal, Curve, Zigzag) 2.2 Space: Definition and concept of space, physical and psychological effects of space 2.3 Shapes and Form: Definition and concept of shape and form, Types of shape (Equal sided shapes, Unequal sided shapes), Types of form (Equal sided forms, Unequal sided forms), Relationship between two dimensional shapes and three-dimensional forms. 2.4 Texture: Definition and concept of texture, Types of texture (smooth, transparent, rough, stiff, dull, Stoney, opaque etc., Psychological and physical effect of Texture 2.5 Color: Definition and concept of colour, Psychological and physical effects of colour, Primary, secondary and tertiary colour. Dimension of colour – Hue, Value & Intensity, neutral colour, Tints and Shade, Warm and Cool colour. Colour scheme (Analogous, Monochromatic, Complementary, Double complementary, Split complementary, Double split complementary, Triad colour)	**CO2**
TSO 3a. Identify principles of design. *TSO 3b.* List principles of design. *TSO 3c.* Explain principles of design. *TSO 3d.* Apply principles of design on garment.	**Unit-3.0 Definition and Effect of Principals in Apparel Design** 3.1 Principles of design: Harmony Definition and concept, physical & psychological effects of harmony 3.2 Balance: Definition and concept, Types of balance, Physical & psychological effects of balance. 3.3 Emphasis: Definition and concept, Physical & psychological effects of emphasis. 3.4 Proportion: Definition and concept, Physical & psychological effects of proportion. 3.5 Rhythm: Definition and concept, Physical & psychological effects of Rhythm. 3.6 Repetition: Definition and concept, Physical & psychological effects of repetition.	**CO3**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
	3.7 Parallelism: Definition and concept, Physical & psychological effects of parallelism. 3.8 Gradation: Definition and concept, Physical & psychological effects of Gradation. 3.9 Transition: Definition and concept, Physical & psychological effects of Transition. 3.10 Radiation: Definition and concept, Physical & psychological effects of Radiation.	
TSO 4a. Identify elements of design in principles. *TSO 4b.* Explain importance of elements and principles of design. *TSO 4c.* Use different elements with principles of design. *TSO 4d.* Apply Principle and the elements of design on apparel.	**Unit-4.0 Principle and Elements** 4.1 Origin Harmony and the elements, 4.2 Balance and the elements, 4.3 Emphasis and the elements, 4.4 Proportion and the elements, 4.5 Rhythm and the elements 4.6 Repetition and the elements 4.7 Parallelism and the elements 4.8 Gradation and the elements 4.9 Transition and the elements 4.10 Radiation and the elements 4.11 Rhythm and the elements	**CO4**
LSO 5a Identify Types of Design *LSO 5b* Explain importance of design. *LSO 5c* Use structural and Decorative design on apparel. *LSO 5d* Apply structural and decorative design on apparel. *LSO 5e* Create reduction and enlargement of design.	**Unit-5.0 Types, Importance and Use of Design** 5.1 Structural design, 5.2 Decorative design, 5.3 Reducing and enlargement of design	**CO5**

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2450101

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 1.1 Identify tools and media used for drawing and sketching.	1.	Prepare Natural drawing by hand.	CO1
	2.	Prepare Object drawing by hand.	CO1
	3	Prepare Freehand drawing by hand.	CO1
	4	Prepare memory drawing by hand.	CO1
LSO 2.1 Develop drawings and sketches using appropriate elements of design	5	Draw Effect of different types of line.	CO2
	6	Draw Effect of different equal and un equal shape	CO2

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
	7	Draw Effect of different equal and un equal form	CO2
	8	Draw Effect of different texture	CO2
	9	Draw colour wheel and effect of different colour scheme.	CO2
LSO 3.1 Prepare a drawing using given principle.	10	Prepare the sheet of principles and the elements as applied to dress with reference to theory.	CO3
LSO 4.1 Differentiate and prepare different types of design.	11	Draw neat sketches of embroidery tool.	CO4
	12	Prepare samples of Basic embroidery.	CO4
LSO 5.1 Apply Reducing and Enlargement of design.	13	Preparation of the sheet showing following design. • Reducing a design. • Enlarging a design	CO5

L) **Suggested Term Work and Self Learning: S2450101** Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

1. Write problem solving remedies after observing problem of sewing machine.
2. Collect the picture of different seams from internet.
3. Collect the picture of different fullness from internet.
4. Collect the picture of different tool of embroidery from internet.
5. Draw any five combined stitch design for embroidery on a sheet.

b. Micro Projects:

1. Draw a poster for providing message about Sustainable environment/green technology.
2. Draw square motif of 0.5" x 0.5" inch (approx.) use this motif in different orientations and represent each of the followings:

In black outline create an overall pattern surface. • In black outline create a border of 1 ½" width.

3. Observe and analyze any selected area and identify the elements of design present in it.
4. Select a colourful picture from a magazine/ online and find out the colour scheme present in it.
5. Sketch any 3-design representing any three colour schemes.
6. Observe and analyze the selected natural forms and identify the principles of design.

c. Other Activities:

1. Poster making related to:
   - Tool and Media used for drawing.
   - Element of Design
   - Principle of Design
   - Colour scheme

2. Visits: Visit nearby garden/architectural building/nature and observe element and principle of design.
   - Prepare report of visit with special comments of element and principle used.

3. Self-Learning Topics:
   - Collect the picture of dresses and identify element of design.
   - Collect the picture of dresses and identify principle of design.

- Collect the picture of dresses and identify colour scheme.

M) Suggested Course Evaluation Matrix: The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	10%	10%	10%	20%	10%	10%	20%
CO-2	30%	30%	30%	20%	30%	35%	20%
CO-3	20%	20%	20%	20%	20%	35%	20%
CO-4	25%	25%	25%	20%	25%	10%	20%
CO-5	15%	15%	15%	20%	15%	10%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (Cl) Hours	Relevant COs Number(s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit-1.0 Tool and media used for drawing	4	CO1	6	3	2	1
Unit-2.0 Element of Design	16	CO2	26	6	10	10
Unit-3.0 Principle of Design.	6	CO3	12	3	4	5
Unit-4.0 Principle and the Elements	10	CO4	18	5	6	7
Unit-5.0 Types, Importance and Use of Design	6	CO5	8	3	2	3
Total	**42**	**-**	**70**	**20**	**24**	**26**

Note: Similar table can also be used to design class/mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Prepare Natural drawing by hand.	CO1	40	50	10
2.	Prepare Object drawing by hand.	CO1	40	50	10
3.	Prepare Freehand drawing by hand.	CO1	40	50	10
4.	Prepare memory drawing by hand.	CO1	40	50	10
5.	Draw Effect of different types of line.	CO2	40	50	10
6.	Draw Effect of different equal and un equal shape	CO2	40	50	10
7.	Draw Effect of different equal and un equal form	CO2	40	50	10
8.	Draw Effect of different texture	CO2	40	50	10
9.	Draw colour wheel and effect of different colour scheme.	CO2	40	50	10
10.	Prepare the sheet of principles and the elements as applied to dress with reference to theory.	CO3	40	50	10
11.	Prepare the sheet of structural design decorative design.	CO4	40	50	10
12.	Prepare the sheet of different types of decorative design	CO4	40	50	10
13.	Preparation of the sheet showing following design. • Reducing a design. • Enlarging a design	CO5	40	50	10

Legend:
PRA*: Process Assessment
PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/practical to assess the student performance.

P) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Field Trips, Portfolio Based, Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field Information and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/Practical Number
1.	Drawing kit	All tool and media used for drawing and sketching	All

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Marian L Devis	Visual design in dress	PEARSON, USA. 21, 1996 • ISBN- : 9780131121294 • ISBN-: 9780131121294
2.	Mary Kefgan	Individuality in clothing selection and personal appearance	Prentice Hall PTR,5T 1971, ISBN 13: 9780130358653
3.	Hemstead	Colour and line in dress	Lawrance Prantice Hall, 2012 • ISBN-10: 1258256517 • ISBN-13 : 1258256517-978
4.	Pattrick JohnIrcland	Fashion design illustration Men	5-July 1996, B.T. Batsford Ltd. London,07134646235
5.	Byrta Carson	How you look and dress?	Mc graw hill book co.1969 ISBN-13 : 0070101746-978

(b) Online Educational Resources:

1. https://youtu.be/KO1_DJF5mNs
2. https://youtu.be/6x2U2EtQxgo
3. https://youtube.com/shorts/cQp-OyLaE0Y?feature=share
4. https://youtu.be/fB8vg_iTf38

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. https://cbseacademic.nic.in/web_material/doc/2014/13_Fashion_Studies_Textbook_XI.pdf
2. https://www.teacheroz.com/apah-elements.pdf
3. https://quizizz.com/admin/quiz/5baa46cc164f390019cf5511/elements-and-principles-of-design
4. https://www.incredibleart.org/files/Test.htm
5. Lab Manuals

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A) Course Code : 2450102 (T2450102/P2450102/S2450102)

B) Course Title : Figure & Garment Sketching

C) Pre- requisite Course(s) :

D) Rationale :

Figure Sketching is a specialized art of drawing human form that involves proportion guidelines to create stylized fashion figures (croquis). It involves sketching of female, male and child fashion figure. On the other hand, Garment sketching helps to visualize the designs and silhouette of an outfit on a figure, communicate the texture, print, embellishment and details like neckline, sleeves, pockets etc. of a garment. Figure and Garment sketching is an indispensable skill for a budding designer as it helps him/her to showcase his/ her collection, create visual merchandising display and convey design ideas to the client or manufacturer.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/ industry.

After completion of the course, the students will be able to-

- **CO-1** Draw female fashion figure of different head dimensions, poses, views, and body, hand and leg postures.
- **CO-2** Draw male and child fashion figure of different head dimensions, poses and views.
- **CO-3** Design outfits using combination of various design details.
- **CO-4** Sketch the designs of garments by implementing surface embellishment and fullness techniques.
- **CO-5** Design garments by combining appropriate design details, fullness techniques, surface embellishment and fabric textures.
- **CO-6** Draw the figure, outfits and accessories by referring photographs.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Develop-ment of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	1	2	-	-	1	1		
CO-2	3	1	2	-	-	1	1		
CO-3	3	-	3	-	1	1	1		
CO-4	3	1	2	-	1	1	1		
CO-5	3	-	3	-	1	1	1		
CO-6	3	2	2	-	-	1	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

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G) Teaching & Learning Scheme:

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Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, and seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2450102

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 1a. Differentiate between proportion of average female figure and fashion figure. *TSO 1b.* List the measurements of vertical and horizontal division of average female figure. *TSO 1c.* Write the measurements of vertical and horizontal division of female fashion figure of the given head dimensions. *TSO 1d.* Convert Stick figure to Block figure of the given head dimension. *TSO 1e.* Draw stick figure for the given pose and head dimensions and convert it into flesh figure. *TSO 1f.* List the measurements of vertical and horizontal division of female fashion figure for the given view and given head dimensions. *TSO 1g.* Draw different positions of body, hand & leg for the given head dimensions.	**Unit-1.0 Female Fashion Figure (Croqui)** 1.1 7½ head average female figure (Stick, Block & Flesh figure) 1.2 9 head female fashion figure (Stick, Block & Flesh figure) 1.3 12 head female fashion figure (Stick, Block & Flesh figure) 1.4 Different Poses: 1.4a Standing Pose 1.4b Sitting Pose 1.4c Walking Pose 1.5 Different Views: 1.5a Front view 1.5b Back view 1.5c ¾ view 1.5d Profile (Side view) 1.6 Body, hand and leg posture	**CO1**
TSO 2a. Differentiate between average male and female figure. *TSO 2b.* Compare the proportion of male and female fashion figure. *TSO 2c.* List the measurements of vertical and horizontal division of average male figure. *TSO 2d.* Write the measurements of vertical and horizontal division of male fashion figure of the given head dimensions. *TSO 2e.* Convert Stick figure to Block figure of given head dimensions. *TSO 2f.* Sketch the given pose and view of male fashion figure. *TSO 2g.* Write the measurements of vertical and horizontal division of child figure of given head dimensions. *TSO 2h.* Compare the vertical division of five and six head child figures.	**Unit-2.0 Male & Child Fashion Figure (Croqui)** 2.1 Male Fashion Figure 2.1a 7½ head average male figure (Stick, Block & Flesh figure) 2.1b 10 head male fashion figure (Stick, Block & Flesh figure) 2.1c 12 head male fashion figure (Stick, Block & Flesh figure) 2.1d Different Poses & Views 2.2 Child Figure 2.2a Four head figure for infant 2.2b Five head figure for child 2.2c Six head figure for child	**CO1, CO2**
TSO 3a. Enumerate the names of basic and stylized necklines/ collars/ sleeves/ pockets.	**Unit-3.0 Design Details in Garment** 3.1 Necklines : 3.1a Basic Neckline: Round, Square, V & U necklines	**CO1, CO3**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 3b. Explain with diagram the given necklines/collars/ sleeves/ pockets/ jabots/ yokes / drapes. *TSO 3c.* Outline the difference between given design details with diagram. *TSO 3d.* Design the drape effect of Western, Indian and indo-western garments on fashion figure of given head dimensions with sketches. *TSO 3e.* Illustrate the given garment on fashion figure of the given head dimensions using combination of various design details.	3.1b Stylized Necklines: Boat, Illusion, Cowl, Halter, Plunge, Drawstring, Asymmetric, Off Shoulder. 3.2 Collars: Mandarin, Notched, Peterpan, Shirt, Turtle, Shawl, Ruffle 3.3 Sleeves: Puff, Raglan, Kimono, Bishop, Cap, Petal, Bell, Leg-o-mutton 3.4 Pockets: Patch, Pouch, Slash, Ticket, Welt 3.5 Jabot 3.6 Yokes 3.7 Drapes	
TSO 4a. Explain the given fullness techniques with diagram. *TSO 4b.* Choose appropriate fullness techniques as per the requirement of end use of garment with justification. *TSO 4c.* Classify the techniques of surface embellishment. *TSO 4d.* Illustrate the given surface embellishment using appropriate color medium. *TSO 4e.* Distinguish between appliqué and patch work. *TSO 4f.* Explain the given type of embroidery with sketches.	**Unit-4.0 Fullness Techniques and Surface Embellishment** 4.1 Fullness techniques: 4.1a Pleats 4.1b Tucks 4.1c Shirring 4.1d Gathers 4.1e Frills 4.1f Flounces 4.1g Dart 4.1h Gores 4.1i Godet 4.2 Rendering Surface Embellishment with different color medium**:** 4.2a Embroidery 4.2b Applique 4.2c Smocking 4.2d Bead work 4.2e Patch work	**CO1, CO4**
TSO 5a. Select suitable color medium for rendering the given fabric with justification. *TSO 5b.* Draw the stick & flesh figure for the pose by analyzing the given photograph. *TSO 5c.* Render the outfit (using figure drawn above) creating the fabric folds & textures using appropriate color media per the given photograph. *TSO 5d.* Design outfits on fashion figure combining varied design details, fabric textures and surface embellishments.	**Unit-5.0 Fabric Rendering, Photo Illustration** 5.1 Fabric Rendering: 5.1a Denim 5.1b Leather 5.1c Checks & Prints 5.1d Brocade 5.1e Silk 5.1f Cotton 5.1g Lace 5.1h Sheer Fabric 5.1i Knits 5.1j Fur 5.2 Photo Illustration: Design Drawing from Photograph 5.2a Rendering Saree 5.2b Rendering Casual outfit (for male, female and child) 5.2c Rendering Office Wear (for male, female) 5.2d Rendering Bridal Wear (for male & female)	**CO5, CO6**

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2450102

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 1.1. Use the measurements of vertical and horizontal divisions to draw the female fashion figure of the given head dimensions. *LSO 1.2.* Convert stick to flesh figure.	1.	Sketch the stick figure and convert it into flesh figure of the following head dimensions: • 7½ head average female figure • 9 head female fashion figure • 12 head female fashion figure	CO1
LSO 2.1. Sketch varied poses, views, and hand and leg positions of female fashion figure by changing the balance line of the body.	2.	Draw the female fashion figure combining the given pose, view, and hand and leg positions.	CO1
LSO 3.1. Use the measurements of vertical and horizontal divisions to draw male fashion figure of the given head dimensions. *LSO 3.2.* Convert stick to flesh figure of the given head dimensions.	3.	Sketch the stick figure and convert it into flesh figure of the following head dimensions: • 7½ head average male figure • 9 head male fashion figure • 12 head male fashion figure	CO2
LSO 2.2. Sketch varied poses and views of male fashion figure by changing the balance line of the body.	4.	Draw the male fashion figure combining the given pose and view.	CO2
LSO 5.1. Use the measurements of vertical and horizontal divisions to draw child fashion figure of the given head dimensions. *LSO 5.2.* Convert stick to flesh figure of the given head dimensions.	5.	Sketch the stick figure and convert it into flesh figure of the following head dimensions: • Four head figure for infant • Five head figure for child • Six head figure for child	CO2
LSO 6.1. Sketch the design details precisely showcasing fabric folds and stitches. *LSO 6.2.* Design garments using combination of varied design details as per the prevailing trends.	6.	Sketch the given design details using 9 head female fashion figure: • Basic and stylized necklines • Collars • Sleeves • Pockets • Jabots • Yokes • Drapes	CO1, CO3
LSO 7.1. Render the fullness techniques creating appropriate folds, depth and shades of the fabric. *LSO 7.2.* Design outfits combining the appropriate fullness techniques and design details as per the requirement and prevailing trends.	7.	Sketch the given fullness techniques on garments using 9 head fashion figure (male/ female) or six head child figure: • Pleats • Tucks • Shirring • Gathers • Frills • Flounces • Dart • Gores • Godet	CO1, CO2, CO3, CO4
LSO 8.1. Design varied articles such as table runner, curtains, apparel etc. by combining 2 or more surface embellishment techniques.	8.	Sketch the effect of following surface embellishments on the given article: • Embroidery • Applique • Smocking • Bead work	CO4

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
		• Patch work	
LSO 9.1. Design outfits such as casual wear, ethnic wear, formal wear etc. by combining the appropriate design details, surface embellishments and textures of fabric.	9.	Sketch the following textures of fabric on the given garment: • Denim • Leather • Checks & Prints • Brocade • Silk • Cotton • Lace • Sheer Fabric • Knits • Fur	CO3, CO4, CO5
LSO 10.1. Render the outfit as per the given photograph.	10.	Draw the figure, garment, fabric texture, design details, embellishment, and accessories as per the given photograph.	CO1, CO2, CO3, CO4, CO5, CO6

L) Suggested Term Work and Self Learning: S2450102 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Prepare sheets illustrating the fashion figures, design details, surface embellishments, fullness techniques and photo illustration mentioned in Unit 1.0, 2.0, 3.0, 4.0 and 5.0

b. Micro Projects:

i. Select a garment that has sleeves and collar and create a series of sleeve and collar variation that would complement the garment's overall design. Try out different sleeve length, shapes, details and finishes. Use fashion figure (female/male/child) of desired head dimensions to present your designs.
ii. Choose a theme or inspiration and create a collection of fashion sketches that include appropriate clothing with respect to design details, fabric textures, surface embellishment and fullness techniques.

c. Other Activities:

1. Workshop Topics:
   - Basic sketching techniques.
   - Proportion and anatomy of human figure.
   - Creating ombre, sequin, fringe, brocade fabric effects using varied color media.
   - Creating a collection based on theme.

   Visits: Visit nearby art exhibitions, handloom exhibitions, and garment shops, fashion shows to explore the prevailing trends and ideate new designs.

2. Self-Learning Topics:
   - Varied pencil strokes needed for free hand illustrations.
   - Trend forecasting: Upgrade with latest fashion trends and incorporate it in garment illustration.

M) Suggested Course Evaluation Matrix: The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work& Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	15%	15%	15%	-	-	10%	15%
CO-2	15%	15%	15%	-	-	10%	15%
CO-3	20%	20%	20%	20%	30	20%	20%
CO-4	20%	20%	20%	30%	30	20%	20%
CO-5	15%	15%	15%	25%	20	20%	15%
CO-6	15%	15%	15%	25%	20	20%	15%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs?

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (Cl) Hours	Relevant COs Number(s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit-1.0 Female Fashion Figure (Croqui)	8	CO1	10	3	3	4
Unit-2.0 Male & Child Fashion Figure (Croqui)	8	CO1, CO2	10	3	3	4
Unit-3.0 Design Details in Garment	10	CO1, CO3	14	4	4	6
Unit-4.0 Fullness Techniques and Surface Embellishment	10	CO1, CO4	14	4	4	6
Unit-5.0 Fabric Rendering, Photo Illustration	12	CO5, CO6	22	6	6	10
Total	**48**	**-**	**70**	**20**	**20**	**30**

Note: Similar table can also be used to design class/mid-term/ internal question paper for progressive assessment.

O) Suggested AssessmentTable for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Sketch the stick figure and convert it into flesh figure of the following head dimensions: • 7½ head average female figure • 9 head female fashion figure • 12 head female fashion figure	CO1	30	60	10
2.	Draw the female fashion figure combining the given pose, view, and hand and leg positions.	CO1	40	50	10
3.	Sketch the stick figure and convert it into flesh figure of the following head dimensions: • 7½ head average male figure • 9 head male fashion figure • 12 head male fashion figure	CO2	30	60	10
4.	Draw the male fashion figure combining the given pose and view.	CO2	40	50	10
5.	Sketch the stick figure and convert it into flesh figure of the following head dimensions: • Four head figure for infant • Five head figure for child • Six head figure for child	CO2	30	60	10
6.	Sketch the given design details using 9 head female fashion figure: • Basic and stylized necklines • Collars • Sleeves • Pockets • Jabots • Yokes • Drapes	CO1, CO3	30	60	10
7.	Sketch the given fullness techniques on garments using 9 head fashion figure (male/ female) or six head child figure: • Pleats • Tucks • Shirring • Gathers • Frills • Flounces • Dart • Gores • Godet	CO1, CO2, CO3, CO4	30	60	10
8.	Sketch the effect of following surface embellishments on the given article: • Embroidery • Applique • Smocking • Bead work • Patch work	CO4	30	60	10
9.	Sketch the following textures of fabric on the given garment: • Denim • Leather • Checks & Prints • Brocade	CO3, CO4, CO5	40	50	10

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
	• Silk • Cotton • Lace • Sheer Fabric • Knits • Fur				
10.	Draw the figure, garment, fabric texture, design details, embellishment, and accessories as per the given photograph.	CO1, CO2, CO3, CO4, CO5, CO6	40	50	10

Legend:
PRA*: Process Assessment
PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/practical to assess the student performance.

P) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Field Trips, Portfolio Based, Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field Information and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Materials Required	Broad Specifications	Relevant Experiment/Practical Number
1.	Cartridge Sheets and Ivory Sheets	¼ Sheet	All experiments
2.	Color Pencils	Staedlers 137 C Luna Water based colours (pack of 48 colours), Faber Castell Polychromous colour pencil set (pack of 36 colours)	All experiments
3.	Other Colour Medium	Water colour, waterproof ink, acrylic colours.	6,7,8,9,10
4.	Sketch Pens and Brush Pens	Camlin Brush Pens (pack of 24 colours) Faber Castell connector sketch pens (pack of 50)	6,7,8,9,10
5.	Painting Brushes	1.Round water colour brushes (Camlin or Fine Art) Size nos.0, 2, 4,5,8,10,12 2. Flat water colour brushes (Camlin or Fine Art) Size nos.3, 5,8,12	6,7,8,9,10
6.	Colour Pallette		As per requirement.

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	New Encyclopedia of Fashion Details	Patrick Jhon Ireland	Batsford Ltd, 2008 ISBN-13: 978-1906388065
2.	Fashion Drawing- The Basic Principles	Anne Allen and Julian Seaman	Batsford Ltd, 2003 ISBN-13: 978-0713470963

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
3.	Fashion Illustration Techniques: A Super Reference Book for Beginners	Zeshu Takamura	Rockport Publishers, Reprint edition (1 April 2012) ISBN-13 : 978-1592537952
4.	Fashion Illustration Techniques	Maite Lafuente	Taschen America ; Multilingual edition (1 August 2008) ISBN-13 : 978-3836504072
5	Fashion illustration for Designers	Kathryn Hagen	Pearson Education, New Jersey. 2005 ISBN-13 : 978-0135015575

(b) Online Educational Resources:

1. https://www.youtube.com/watch?v=mEJU_uOM2ps
2. https://www.youtube.com/watch?v=b9qrj0MXFSg
3. https://www.youtube.com/watch?v=gZZ_y3DsWBs
4. https://www.youtube.com/watch?v=vpbIitbpCeU
5. https://www.youtube.com/watch?v=K3p1xXVqlus
6. https://www.youtube.com/watch?v=f_PXydshfJw&t=33s
7. https://www.youtube.com/watch?v=BVlFo02kSKo

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

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A) Course Code : 2400103C (T2400103C /P2400103C / S2400103C)

B) Course Title : Applied Chemistry- C (TE, CACDDM, FCT, GT)

C) Pre- requisite Course(s) :

D) Rationale :

Given course is the applied form of Chemistry. It is an application of basic knowledge of chemistry to understand the requirements of the industries related to textile and garments. This course intends to impart technical knowledge along with productive practice to the students of the diploma engineering. Students will learn about the chemical characteristics of materials, such as their reactivity, bonding, and molecular structures, through the chemistry course. With this understanding, students will be able to choose materials intelligently for certain applications and create new materials that fulfil market demands. Diploma engineers have to deal with various chemicals in diverse technical and engineering fields. Dying, bleaching and cleaning fabric in the textile and garment industry and related areas will require engineers to acquire essential knowledge in chemistry to choose appropriate chemicals, dyes, bleaching agents, soap, detergents and enzyme-based detergents which should be economical and eco-friendly. Student will learn about various types of natural and man-made fibres which requires basics of monomers used and polymerization. Basic knowledge of chemistry is essential to treat textile industry effluents containing various types of synthetic dyes, metals, chlorine and other pollutants which has become an environmental concern.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of the following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/ laboratory/ workshop/ field/ industry.

After completion of the course, the students will be able to-

- **CO-1.** Solve various engineering problems applying the basic concepts of atomic structure, chemical bonding and solutions.
- **CO-2.** Apply the concepts of chemical structure, properties and identification of polymers and fibers in textile and garment industry.
- **CO-3.** Apply suitable **wastewater treatment** techniques in textile industry.
- **CO-4.** Use appropriate chemicals such as dyes, bleaching agents, soaps, detergents and enzyme-based detergents in textile and garment industry.
- **CO-5.** Use concepts of organic molecules and isomerism to solve various engineering problems.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes(POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	-	-	-	-	-	-		
CO-2	3	-	2	-	2	1	2		
CO-3	3	3	1	2	-	1	-		
CO-4	3	-	-	-	1	-	1		
CO-5	3	-	-	-	-	-	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study(Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2400103C	Applied Chemistry-C	03	-	04	02	09	06

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2400103C	Applied Chemistry - C	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in classroom (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2400103C

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 1a. Explain quantum numbers and their significance briefly. *TSO 1b.* Explain the importance of principles followed in expressing electronic configuration of elements. *TSO 1c.* Explain different types of Chemical Bonding with examples. *TSO 1d.* List different modes of expressing the concentration of solutions-Molarity, Normality, and parts per million. *TSO 1e.* Prepare solution of given concentration. *TSO 1f.* Describe the balancing of chemical equation of redox reaction using ion-electron method.	**Unit-1.0 Atomic Structure, Chemical Bonding, solutions, and Redox Reactions** 1.1 Fundamental particles- mass and charges of electrons, protons, and neutrons with names of the scientists who discovered these fundamental particles. 1.2 Atomic number, atomic mass number. 1.3 Definition of orbit and orbitals, shapes of s and p orbitals, the 1.4 Brief concept of quantum numbers and their significance. 1.5 Introduction to Aufbau's principle, Pauli's exclusion principle and Hund's rule of maximum multiplicity. 1.6 Electronic configurations of elements with atomic number up to 20. 1.7 Chemical bonding- Ionic or Electrovalent bond, Covalent bond, Coordinate bond, Hydrogen bond. 1.8 Solutions, Solute and Solvent, Modes of expressing concentration of solutions-Molarity, Normality, and parts per million. 1.9 General introduction Oxidation and Reduction, Oxidation number, Balancing of Chemical Equations of Redox Reaction by Ion-Electron Method. 1.10 Indian Chemistry: -Philosophy of atom by Acharya Kanad. (IKS)	**CO1**
TSO 2a. Differentiate between addition and condensation polymerization. *TSO 2b.* Explain molecular arrangement of polymers. *TSO 2c.* Describe primary and secondary properties of fibre. *TSO 2d.* Classify Fibre based on origin. *TSO 2e.* List monomers and chemical reactions involved in the synthesis of Rayon, Nylon-6, Nylon-6,6, Polyester, Polyethylene and Spandex. *TSO 2f.* Explain identification tests of fibres. *TSO 2g.* Identify fibers based on physical and chemical tests.	**Unit-2.0 Fibres and Polymers** 2.1 Definition of Monomer, Polymer-types of polymers: homopolymer and copolymer, Degree of Polymerization, Types of polymerization-addition and condensation polymerization, Polymer arrangement: Crystalline and Amorphous arrangement, Orientation of fibre. 2.2 Definition of the Terms: Textile, Fibre, Textile fibre, Staple, Filament, Yarn and thread. 2.3 Primary and secondary properties of textile fibre. 2.4 Fibre classification by origin: Natural fibres- Plant fibre-cotton, bast fibre-jute and flax, Protein/Animal fibre- wool and silk, Mineral 2.5 Fibre – Asbestos, monomers and chemical reaction involved in the synthesis of man-made fibres: Rayon, Nylon (6 & 6,6), Polyester, Acrylic, Olefins (Polyethylene and	**CO2**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
	Polypropylene) and Elastomeric fibres-spandex, Comparison of natural and man-made fibres. 2.6 Identification of fibres- feeling test, burning test, chemical test.	
TSO 3a. Differentiate between hard water and soft water. *TSO 3b.* Estimate the hardness of water using EDTA titration method. *TSO 3c.* Explain the effect of hardness of water in textile industry. *TSO 3d.* Explain the various water softening techniques. *TSO 3e.* Determine the dissolved oxygen (DO) and biological oxygen demand (BOD) of a wastewater sample. *TSO 3f.* Identify given samples as acid, base or neutral. *TSO 3g.* Explain the two parameters BOD and COD to measure water quality and the amount of organic pollutants present in water. *TSO 3h.* Use the Indian standard specification of drinking water.	**Unit-3.0 Water** 3.1 Introduction, Sources of Water, Hardness of water, types of hardness, Degree of Hardness (In terms of CaCO3 equivalent), Unit of Hardness, Quantitative Measurement of Water Hardness by EDTA method. 3.2 Bad effect of hard water in textile industries-scale and sludge formation in boilers, disadvantage of scale formation. 3.3 Water Softening Technique-Soda Lime Process, Zeolites method and cation-anion exchange method. 3.4 Concept of pH and its applications. 3.5 Determination of Dissolved Oxygen, Water Quality Index - Biological Oxygen Demand, Chemical Oxygen Demand, Simple Numerical Problems. 3.6 Indian standard specification of drinking water.	**CO3**
TSO 4a. Differentiate between soap and detergent. *TSO 4b.* Explain the cleansing action of soap. *TSO 4c.* List different types of detergents. *TSO 4d.* Describe the importance of saponification values. *TSO 4e.* Use of different enzyme-based detergents in textile industry. *TSO 4f.* Classify stains and their removal techniques. *TSO 4g.* list different bleaching agents used in textile industry. *TSO 4h.* Describe the use of indigo, phenolphthalein and methyl orange dye in textile industry.	**Unit-4.0 Soap, Detergents and Dyes** 4.1 Cleaning agent: soap- chemical composition, Detergent: chemical composition, types of detergent. Cleansing action of soaps and detergents, difference between soap and detergent. 4.2 Saponification values- Definition, determination, and significance. 4.3 Enzyme based detergents: Introduction to enzyme-based detergents and their types: proteases, amylases, lipases, cellulases, mannanases and pectinases, merits of enzyme-based detergents over synthetic detergents, cleansing action of enzyme-based detergents. 4.4 Stain: Definition of stain, classification, and removal techniques of stains -Protein stain, Tannin stains, Oil – based stains, Dye stains, Combination Stains, Stains require special treatment methods. 4.5 Bleaching agent: Definition of bleaching agent, classification of bleaches: oxidizing bleaches- halogen and peroxide bleaches (universal bleaching agent) and reducing bleaches, purposes of bleaching, advantages, and disadvantages of bleaching. 4.6 Dyes: Definition of dye, classification of dyes, Introduction to some dyes: indigo dye, phenolphthalein, methyl orange.	**CO4**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 5a. Identify the structures of organic compound based on their classification. *TSO 5b.* Classify structures of organic molecules. *TSO 5c.* Draw structures of organic molecules. *TSO 5d.* Identify different types of structural isomerism in different molecules. *TSO 5e.* Differentiate amongst different organic compounds based on the functional group.	**Unit-5.0 Basics of Organic Chemistry** 5.1 Classification of organic compounds (acyclic or open chain compounds, cyclic or closed chain or ring compounds- aromatic compounds). 5.2 Introduction to Functional groups (alkenes, alkynes, halides, alcohols, aldehydes, ketones, nitriles, ethers, carboxylic acids, esters, amines, amides, nitro compounds). 5.3 Isomerism, structural isomerism (chain, position and functional), stereoisomerism (geometrical and optical isomerism)	**CO5**

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2400103C

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 1.1. Weigh oxalic acid. LSO 1.2. Prepare a solution of oxalic acid.	1.	Preparation of 250ml N/I0 Oxalic acid Solution.	CO1
LSO 2.1. Weigh Sodium Carbonate. LSO 2.2 Prepare a solution of sodium carbonate.	2.	Preparation of 250ml N/10 Sodium Carbonate Solution.	CO1
LSO 3.1. Use of appropriate indicator for acid-base titration. LSO 3.2 Analyze titration curves for weak acid and strong base.	3.	Determination of strength of Sodium Hydroxide Solution by Titrating against Oxalic Acid solution.	CO1
LSO 4.1. Identify given textile fibre using chemicals. LSO 4.2. Distinguish between animal and vegetable fibre.	4.	Identification of textile fibres like cotton, linen, wool, silk, nylon, polyester, and acrylic using chemical tests.	CO2
LSO 5.1. Identify given textile fibre using burning test. LSO 5.2. Distinguish between animal and vegetable fibre.	5.	Identification of textile fibres like cotton, linen, wool, silk nylon, polyester and acrylic by burning test.	CO2
LSO 6.1. Determine the total hardness of given sample of water in terms of CaCO3 by EDTA titration method. LSO 6.2. Draw the structure of complex of metal ions with ethylenediaminetetraacetic acid (EDTA).	6.	Determination of total hardness of water sample in terms of $CaCO_3$ by EDTA titration method using Eriochrome black-T as indicator.	CO3
LSO 7.1. Determine the saponification value of oil. LSO 7.2. Compare saponification values of some given oils.	7.	Determination of saponification value of the given oil/fat.	CO4
LSO 8.1. Perform Baeyer's test LSO 8.2. Perform Bromine Test	8.	Identification of the presence of unsaturation in a given organic compound.	CO5
LSO 9.1. Perform Ceric Ammonium Nitrate test LSO 9.2. Perform Iodoform test	9.	Identification of the presence of alcoholic functional group in a given organic compound.	CO5
LSO 10.1. Perform 2,4-Dinitrophenyl Hydrazine Test LSO 10.2. Perform Fehling's Test LSO 10.3. Perform Tollen's Test	10.	Identification of the presence of aldehyde and ketone functional groups in a given organic compound.	CO5

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 11.1. Determine the pH of the given sample using; pH paper, Universal indicator and pH meter.	11.	Determination of pH-Values of given Solution by using pH paper, Universal Indicator and pH-meter.	CO3
LSO 12.1. Perform Fehling's Test LSO 12.2. Perform Sodium Bicarbonate Test	12.	Identification of the presence of a carboxylic acid functional group in a given organic compound.	CO5
LSO13.1. Describe the principle behind the estimation of the dissolved oxygen in water LSO13.2. Determine the oxygen content of the different aquatic habitats.	13.	Determination of Dissolved Oxygen (DO) in the given Sample of Water.	CO3

L) Suggested Term Work and Self Learning: S2400103C Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted Cos such as

1. Write the exceptional behavior of elements Chromium and copper based on their electronic configuration.
2. Prepare the chart displaying different steps involved in **wastewater treatment** in textile industries.
3. Prepare the model, showing the difference between covalent and ionic bond.
4. Prepare a report on the impact of waste generated from textile production on the environment.

b. Micro Projects:

1. Prepare a report by analyzing the cleansing capacity of the different soaps in distilled water and tap water.
2. Collect the sample of water from various water bodies nearby and analyze pH, temperature and dissolved oxygen prepare a report on the same.
3. Sterilization of water samples using bleaching powder.
4. Collect and measure the hardness of different water samples from different sources by using the EDTA titration method.
5. Collect the water samples containing bleaching powder from various sources and measure the percentage of available Chlorine in the collected samples.

c. Other Activities:

1. Seminar Topics:
   - Methods for **Wastewater treatment** in textile/ garment industry
   - Dye used for the given fiber in textile/ garment industry.
   - Chemistry of Dyeing
   - Application of chemistry in textile/ garment industry
   - Application of enzymes in textile/ garment industry
   - Cleansing action of soap and detergents

Visits:

- Organize a visit to the nearby garments industry related to printing and embroidery followed by garment production. There they can explore the different sections like store section,

embroidery section, pattern making, drafting section, cutting section, stitching, finishing section, workshop etc.

- Organize a visit to nearby traditional dying and synthetic dying shops to comprehend the different stages and types of dyeing.
- Visit textile industries to learn the bleaching process.

2. Self-Learning Topics:
   - Basic structure of atom
   - Basics of organic chemistry
   - Cleansing action of soap and detergents
   - **Wastewater treatment**
   - Dyes

M) Suggested Course Evaluation Matrix: The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	10%	10%	15%	15%	15%	10%	10%
CO-2	15%	15%	20%	20%	20%	20%	20%
CO-3	30%	25%	20%	20%	20%	25%	25%
CO-4	15%	20%	20%	20%	20%	15%	15%
CO-5	30%	30%	25%	25%	25%	20%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (Cl) Hours	Relevant Cos Number(s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit-1.0 Atomic Structure, Chemical Bonding and Solutions	12	CO1	18	6	8	4
Unit-2.0 Fibre and Polymers	7	CO2	10	3	3	4
Unit-3.0 Water	5	CO3	08	3	3	2

Unit-4.0 Soap, Detergents and Dyes	12	CO4	17	5	7	5
Unit-5.0 Basics of Organic Chemistry	12	CO5	17	5	7	5
Total	**48**	**-**	**70**	**22**	**28**	**20**

Note: Similar table can also be used to design class/mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Preparation of 250ml N/l0 Oxalic acid Solution.	CO1	40	50	10
2.	Preparation of 250ml N/10 Sodium Carbonate Solution.	CO1	40	50	10
3.	Determination of the strength of Sodium Hydroxide Solution by Titrating against Oxalic Acid Solution.	CO1	30	60	10
4.	Identification of textile fibres like cotton, linen, wool, silk, nylon, polyester and acrylic using chemical tests.	CO2	30	60	10
5.	Identification of textile fibres like cotton, linen, wool, silk nylon, polyester and acrylic by burning test.	CO2	30	60	10
6.	Determination of the total hardness of water sample in terms of CaCO3 by EDTA titration method using Eriochrome black-T as indicator.	CO3	30	60	10
7.	Determination of pH-Values of given samples of Solution by using pH paper, Universal Indicator and pH-meter.	CO3	30	60	10
8.	Determination of saponification value of the given oil/fat.	CO5	30	60	10
9.	Identification of the presence of unsaturation in a given organic compound.	CO5	40	50	10
10.	Identification of the presence of alcoholic functional group in a given organic compound.	CO5	40	50	10
11.	Identification of the presence of aldehyde and ketone functional group in a given organic compound.	CO5	40	50	10
12.	Identification of the presence of a carboxylic acid functional group in a given organic compound.	CO5	30	60	10
13.	Determination of Dissolved Oxygen (DO) in the given Sample of Water.	CO3	30	60	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/practical to assess the student performance.

P) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Field Trips, Portfolio Based, Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field Information and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/Practical Number
1.	Electronic Weighing Balance	Type of Laboratory Balance: Analytical, Sensitivity (mg): 1 mg, Maximum Capacity of weighing (grams): 200 g, Shape of PAN: Circular, Power Supply: Single Phase, Display: LED.	1,2,3, 6, 7, 13
2.	Hot plate magnetic stirrer	Hot plate with Magnetic stirrer: Number of stirring Positions:1, Calibration: Automatic Calibration, Magnetic stirrer with a hot plate, Speed Control Accuracy of set speed (+/-) (RPM): 5, Maximum Stirring capacity per position: 3000 ml,Top plate Material: Stainless steel	7
3.	Digital pH meter	Digital pH Meter: Type: Microcontroller Based, Display: LED / LCD / Touch Screen, 3 digits, Calibration: up to 3 points with auto buffer, pH Range (pH): 0.00 to 14.00, +/- 0.05, Power Requirements: 230 V +/- 10, 50 Hz AC, Modes: pH mV- C, Temperature Compensation Type: Automatic, Temperature Compensation Range (Degree C): 0 to 100, Temperature Accuracy (Degree C): +/- 0.3, Resolution (pH): 0.01	8

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Engineering Chemistry	Jain & Jain	Dhanpat Rai Publishing Co.(P) Ltd., New Delhi, 2015, ISBN: 93-521-6000-2
2.	A Textbook of Engineering Chemistry	Dr S. S. Dara & Dr S. S. Umare	S. Chand & Co.(P) Ltd., New Delhi, 2014, ISBN:81-219-0359-9
3.	Textbook of Chemistry for Class XI & XII (Part-I & II)	NCERT	NCERT, New Delhi, 2017-18, Class-XI, ISBN: 81-7450-494-X (part-I), 81-7450-535-O (part-II), Class-XII, ISBN: 81-7450-648-9 (part-I), 81-7450-716-7 (part-II)
4.	A Textbook of Polymer Chemistry	Dr. M. S. Bhatnagar	S. Chand & Co.(P) Ltd., New Delhi, 2012, ISBN: 9788121941129
5.	Textile Science	E.P.G.Gohl & L.D. Vilensky	CBS, 2nd edition, ISBN-13: 978-8123910383
6.	Textile Auxiliaries and Chemicals with Processes & Formulations	Eiri Board	Engineers India Research Institute (1 December 2009), ISBN : 978-8186732939
7.	Applied Chemistry with Lab manual	Anju Rawlley Devdatta V. Saraf	Khanna Book Publishing Co. (P) Ltd. New Delhi, 2021, ISBN- 978-93-91505-44-8.

(b) Online Educational Resources:

1. https://ncert.nic.in/textbook/pdf/kech102.pdf
2. https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Supplemental_Modules_and_Websites_(Inorganic_Chemistry)/Chemical_Compounds/Introduction_to_Chemical_Bonding
3. https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules_(Analytical_Chemistry)/Electrochemistry/Redox_Chemistry/Balancing_Redox_reactions
4. https://www.onlinetextileacademy.com/basics-of-textile-fibres/
5. https://www.ancient-origins.net/history-famous-people/indian-sage-acharya-kanad-001399
6. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=31024

7. http://ecoursesonline.iasri.res.in/course/view.php?id=235
8. https://ncert.nic.in/textbook/pdf/lech206.pdf
9. https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/canadian-conservation-institute-notes/identification-natural-fibres.html
10. https://www.sctce.ac.in/faculty/facultylogin/Admin/Attachments/Upload/1559025037_1559025037.pdf
11. https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Chemistry_for_Allied_Health_(Soult)/08%3A_Properties_of_Solutions/8.06%3A_The_pH_Concept
12. https://textilelearner.net/soap-and-micelle-in-textile-wet-processing/
13. https://textilelearner.net/stain-removal-techniques-from-clothes/
14. https://archive.epa.gov/water/archive/web/html/vms52.html
15. https://infinitabiotech.com/blog/overview-on-detergent-enzymes/
16. https://www.textileadvisor.com/2022/01/objectives-of-bleaching-process-types.html
17. https://textilelearner.net/different-types-of-dyes-with-chemical-structure/
18. https://ncert.nic.in/ncerts/l/lech205.pdf

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Learning Packages
2. Lab Manuals
3. Manufacturers' Manual
4. Users' Guide

*****

A) Course Code : 2400105D(T2400105D/S2400105D)

B) Course Title : Applied Mathematics -D (CACDDM, FCT, TE, GT, FPP)

C) Prerequisite Course(s) : Algebra, Trigonometry, Coordinate Geometry

D) Rationale :

Mathematics is the core course to develop the competencies of most of the technological courses. It provides students with a fundamental understanding of mathematical principles and concepts necessary for solving engineering problems. Textile engineering and allied programs involve dealing with various quantitative aspects, including measurements, material properties, production data, and quality control. Proficiency in basic engineering mathematics enables students to analyze and interpret these quantitative data accurately. Statistical methods are useful to evaluate and optimize textile processes, conduct experiments, analyze experimental data, and make data-driven decisions for process improvement and quality enhancement. The application of basic engineering mathematics in various aspects of textile engineering, including problem-solving, quantitative analysis, design, optimization, and computer-aided tools, makes this course an indispensable subject for aspiring textile engineers. The course provides an insight to analyze engineering problems scientifically using differentiation, trigonometry, coordinate geometry, mensuration, and statistics.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of the following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor, and Affective) in classroom/laboratory/workshop/field/ industry.

After completion of the course, the students will be able to-

- **CO-1** Demonstrate the ability to solve branch-specific engineering-related problems using applications of differentiation.
- **CO-2** Demonstrate the ability to algebraically analyze basic functions using Trigonometry.
- **CO-3** Solve engineering-related problems based on Straight lines.
- **CO-4** Solve the problems based on measurements of regular close figures and regular solids.
- **CO-5** Apply the concept of statistics to solve engineering-related problems.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Program Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life-Long Learning	**PSO-1**	**PSO-2**
CO-1	3	-	-	-	-	-	-		
CO-2	3	1	1	-	-	-	-		
CO-3	2	1	-	-	-	-	-		
CO-4	3	1	-	-	-	-	1		
CO-5	3	2	-	1	-	-	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by the respective program coordinator at the institute level. As per the latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2400105D	Applied Mathematics - D	02	01	-	02	05	04

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem-based learning, etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/ practical performances / problem-based experiences in laboratory, workshop, field, or other locations using different instructional/ Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro-projects, industrial visits, any other student activities, etc.)

SL: Self Learning, MOOCs, Spoken Tutorials, online educational resources, etc.

C: Credits= (1xClhours) + (0.5xLIhours) + (0.5xNotionalhours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of the teacher to ensure the outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2400105D	Applied Mathematics - D	30	70	20	30	-	-	150

Legend:

PTA: Progressive Theory Assessment in the classroom (includes class test, mid-term test, and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work &self-learning Assessment (Includes assessment related to student performance in assignments, seminars, micro-projects, industrial visits, self-learning, any other student activities, etc.

Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignments, micro-projects, seminars, and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of the respective course. For valid and reliable assessment, the internal faculty should prepare a checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW), and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to the attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020-related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS), and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2400105D

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 1a. Apply the working rules and standard forms of differentiation to find the derivative of simple functions. *TSO 1b.* Invoke the concept of the Chain rule to find the derivative of simple functions. *TSO 1c.* Apply the concept and rules of derivative to solve the problems related to the velocity and acceleration of a given simple function. *TSO 1d.* Apply the concept and rules of derivative to solve the problems related to the maxima-minima of a given simple function.	**Unit-1.0 Differentiation and its Applications** 1.1 Concept and Definition of Differentiation. 1.2 Working rules, sum, products, division. 1.3 Chain rules. 1.4 Applications: velocity, acceleration, maxima-minima of the given function.	**CO1**
TSO 2a. Apply the concept of compound angle, allied angle, and multiple angles to solve the given simple engineering problems. *TSO 2b.* Apply the concept of Sub-multiple angles to solve the given simple engineering problems. *TSO 2c.* Employ the concept of factorization and de-factorization formulae to solve the given simple engineering problems. *TSO 2d.* Use concepts given in Ancient Indian Mathematics for trigonometry to solve given problems. (IKS)	**Unit-2.0 Trigonometry** 2.1 Trigonometric ratios of compound, allied, multiple, and sub-multiple angles (without proof). 2.2 Factorization and de-factorization formula (without proofs). 2.3 Trigonometry in Indian Knowledge System: The Evolution of Sine Function in India. 2.4 Indian Trigonometry: Basic Indian Trigonometry- Introduction and Terminology (From Ancient Beginnings to Nilakantha). 2.5 Trigonometry in Indian Knowledge System: Pythagorean triples in Sulabasutras. (IKS)	**CO2**
TSO 3a. Calculate the angle between the given two straight lines. *TSO 3b.* Formulate an equation of straight lines related to given engineering problems. *TSO 3c.* Identify the perpendicular distance from the given point to the line. *TSO 3d.* Calculate the perpendicular distance between the given two parallel lines. *TSO 3e.* Use the geometry given in Sulabasutras to solve the given problems. (IKS)	**Unit-3.0 Straight line** 3.1 Straight line and slope of a straight line. a. Angle between two lines. b. Condition of parallel and perpendicular lines 3.2 Various forms of straight lines. a. Slope-point form, two-point form b. Slope-intercept form, Intercept-intercept form c. General form d. The perpendicular distance from a point to the line. e. Perpendicular distance between two parallel lines. 3.3 Geometry in Sulabasutras in Indian Knowledge System (construction of the square, circling the square). (Indian Mathematics). (IKS)	**CO3**
TSO 4a. Calculate the area of the given triangle and circle Identify the isomorphic graphs. *TSO 4b.* Determine the area of the given square parallelogram, Rhombus, and Trapezium. *TSO 4c.* Compute the surface area of the given Cuboids, spheres, Cones, and Cylinders. *TSO 4d.* Determine the volume of given Cuboids, Sphere, Cone, and Cylinder.	**Unit-4.0 Mensuration** 4.1 Area of regular Closed figures, Area of Triangle, Square Parallelogram, Rhombus, Trapezium, and Circle. 4.2 Volume of Cuboids, Cone, Cylinder, and Sphere.	**CO4**
TSO 5a. Obtain the range and coefficient of range of the given grouped and ungrouped data.	**Unit-5.0 Statistics**	**CO5**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 5b. Calculate means and standard deviation of discreet and grouped data related to the given simple engineering problems. *TSO 5c.* Define Common causes and Special causes. *TSO 5d.* Define Upper control limit and Lower control limit. *TSO 5e.* Implement control charting to assess process stability. *TSO 5f.* Determine the appropriate type of chart for a given process.	5.1 Range, coefficient of range of discrete and grouped data. 5.2 Mean deviation and standard deviation from the mean of grouped and ungrouped data, weighted means. 5.3 SPC (Statistical Process Control) and significance. 5.4 Histograms and Charts. 5.5 Common causes and Special causes. 5.6 Control limits (Upper control limit and Lower control limit).	

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Tutorial and Outcomes:

Outcomes	S. No.	Tutorial Titles	Relevant COs Number(s)
1.1 Apply differentiation to determine the parameters of the fabric to achieve the desired strength. 1.2 Use the concept of differentiation to calculate the parameters of the fabric to achieve the desired shrinkage. 1.3 Calculate desired thermal conductivity of the fabric that needs to be adjusted, using the concept of differentiation. 1.4 Use differentiation to calculate the parameters of the fabric that need to be adjusted to achieve the desired air permeability. 1.5 Apply differentiation to solve given problems based on the Food Industry.	1.	• Application of differentiation for determining desired strength. • Differentiation and its applications for determining desired shrinkage. • Application of differentiation for determining thermal conductivity. • Differentiation and its applications for determining desired air permeability. • Application of differentiation in the Food industry.	CO1
2.1 Measure the angles of two pieces of fabric and calculate the angle at which the seam needs to be sewn to be perfectly straight. 2.2 Measure the angle of a fabric roll and calculate the angle of the roll. 2.3 Measure the length of the conveyor belt for a given angle of the frame. 2.4 Calculate the circumference of the circle by measuring the radius of a piece of fabric.	2.	• Applications of measuring angles. • Applications of measuring length. • Applications of calculating circumferences.	CO2
3.1 Calculate the amount of fabric required to make a garment with specific measurements. 3.2 Calculate the finished length of a fabric after making a certain number of pleats.	3.	• Applications of measuring length. • Applications of finding slope. • Applications of computing perpendicular distance.	CO3

Outcomes	S. No.	Tutorial Titles	Relevant COs Number(s)
3.3 Make a particular style of garment by calculating the total yardage of fabric needed. 3.4 Estimate the number of ems and seams needed to finish a garment. 3.5 Calculate the total yardage of fabric needed to make a particular style of garment.			
4.1 Calculate the area of a fabric piece given the measurements of length and width. 4.2 Calculate the area of a fabric piece given the measurements of length and width. 4.3 Calculate the weight of a cylindrical fabric piece given the measurements of radius, height, and density. 4.4 Calculate the Weight of a cuboid fabric piece given the measurements of length width, height, and density.	4.	• Applications of calculating area. • Applications of calculating weight.	CO4
5.1 Create a frequency distribution table for the number of textile engineering diploma students in a class. 5.2 Create a distribution graph (bar graph) to illustrate the number of textile engineering diploma students in a class. 5.3 Calculate the mean, median, mode, and range of the number of textile engineering diploma students in a class. 5.4 Explain the difference between a population and a sample in the context of textile engineering diploma students in a class. 5.5 Calculate the standard deviation for the number of textile engineering diploma students in a class.	5.	• Applications of frequency distribution. • Applications of mean, median, and mode. • Applications of calculating standard deviation.	CO5

L) Suggested Term Work and Self-Learning: S2400105D Some sample suggested assignments, micro-projects, and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

1. Use differentiation to determine the rate at which dye is absorbed by the textile material.
2. Use Differential calculus to model and optimize the tensile strength of fabric based on the relationship between fabric composition, weave structure, and tensile strength.
3. Apply Trigonometric functions to create patterns like stripes, checks, or circular designs. Explain the relationship between the function parameters and resulting fabric pattern characteristics.
4. Use Library resources to find various applications of trigonometry in designing food processing equipment.

5. Use Library resources to find various applications of straight lines in fabric inspection to detect distortions or irregularities in woven or knitted fabrics.
6. Prepare a handout and a PDF file on the role of straight lines in assembling and decorating food products such as cakes or Sandwiches.
7. Employ mensuration to calculate fabric weight and Fabric Consumption and prepare a file.
8. Use the concept of mensuration for pattern layout optimization and present the findings.
9. Prepare a write-up on the role of statistical process control in identifying and addressing variations in textile production processes.
10. Prepare a presentation on the role of statistics in the nutritional analysis of food products. Discuss the use of statistical techniques to analyze and interpret data related to nutrient content, dietary intake, and health outcomes.

b. Micro Projects:

1. Prepare charts displaying various standard differential formulas.
2. Explore the use of differential calculus to calculate the velocity and acceleration of a particle.
3. Calculate the rate of change of the temperature and plot its graph.
4. Calculate profit and loss concerning business using graphs.
5. Prepare charts showing the area and volume of various geometrical shapes using mensuration.
6. Draw the graph of the Trigonometric ratio on a chart paper and verify using suitable open-source software.
7. Prepare a model showing the area of different geometrical shapes.
8. Prepare a simulated environment to study the 2D-printing under the influence of coordinate geometry.
9. Prepare a chart consisting of the surface area of cuboids, spheres, cones, and cylinders as their real-life application.
10. Download 5-7 videos based on mean deviation for group data and ungrouped data, watch them, and write a report to detail the mathematical steps involved.
11. Make a short video of duration 5-7 minutes for the use of Laplace transform to calculate the response of a system to an input signal.
12. Download 5-7 videos based on the application of Statistical process control to understand the process of manufacturing products and write a report to detail the mathematical steps involved.
13. Make a short video of duration 10-15 minutes on the engineering application of statistical process control especially in production units in the textile industry.

c. Other Activities:

1. Seminar Topics:
    - Sustainable Textile Manufacturing: Challenges and Opportunities
    - Smart Textiles and Wearable Technology
    - Nanotechnology in Textiles: Advancements and Applications
    - Digital Printing Techniques for Textile Design
    - Innovations in Textile Dyeing and Finishing Processes
    - Advances in Textile Testing and Quality Control
    - Eco-Friendly Textile Fibers: Development and Utilization
    - Trends in Textile Fashion Design and Forecasting
    - Textile Supply Chain Management: Optimization and Logistics
    - Surface Modification Techniques for Textile Material
    - Textile Engineering for Sustainable Apparel Production
    - Future Prospects of 3D Printing in Textile Manufacturing

2. Visits: Visiting the following places would provide students an opportunity to see the application of various branches of mathematics in different fields. This will also help students to comprehend the career opportunities available in the field of mathematics.
    - Visit to a mathematics museum.
    - Visit a mathematics research institute.
    - Visit to a mathematics laboratory.
    - Visit to a Data Science Center.
    - Visit the mathematics department of a college or university.
    - Visit a nearby Textile Industry.
    - Visit to a Space Agency.
    - Visit to a Game Studio.

3. Self-Learning Topics:
    - Applications of differentiation (optimization, rates of change)
    - Statistical inference (confidence intervals, hypothesis testing)
    - Systems of linear equations and their solutions
    - Yarn calculations (count systems, conversions)
    - Fabric calculations (linear density, fabric weight)
    - Statistical analysis of textile data

M) **Suggested Course Evaluation Matrix:** The course teacher has to decide and use the appropriate assessment strategy and its weightage in theory, laboratory, and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	10%	10%	10%	20%	10%	-	-
CO-2	10%	10%	10%	20%	10%	-	-
CO-3	20%	20%	20%	20%	25%	-	-
CO-4	25%	25%	25%	20%	25%	-	-
CO-5	35%	35%	35%	20%	30%	-	-
Total Marks	**30**	**70**	**20**	**20**	**10**	**-**	**-**
			50				

Legend:

*: Other Activities include self-learning, seminars, visits, surveys, product development, software development, etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate
- In the case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided among all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to the achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: The specification table represents the reflection of sample representation of assessment of the cognitive domain of the full course.

Unit Title and Number	Total Classroom Instruction (Cl) Hours	Relevant COs Number(s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit-1.0 Differentiation and its Applications	8	CO1	08	2	4	2
Unit-2.0 Trigonometry	8	CO2	08	2	4	2
Unit-3.0 Straight line	10	CO3	14	4	6	4
Unit-4.0 Mensuration	8	CO4	18	6	6	6
Unit-5.0 Statistics	14	CO5	22	6	8	8
Total	**48**	**-**	**70**	**20**	**28**	**22**

Note: A similar table can also be used to design class/mid-term/ internal question papers for progressive assessment.

O) Suggested AssessmentTable for Laboratory (Practical): (Not Applicable)

P) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lectures, Tutorial, Case Methods, Group Discussions, Industrial visits, Industrial Training, Field Trips, Portfolios, Learning, Role Play, Live Demonstrations in Classrooms, Labs, Field Information, and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/Practical Number
1.	High-end computers	Processor Intel Core i7 with Compilers and Programming Languages, RAM 32GB, DDR3/DDR4, HDD 500 GB, OSWindows10	All
2.	Software	Scientific Calculators, Graphing Calculator, SCILAB, GraphEq^2.13, Microsoft Mathematics, GeoGebra, Math3D	1,2,3,4,5
3.	Printer	High-Speed Duplex Printer	4,5
4.	Scanner	Handheld 3D scanner, Accuracy up to 0.1mm, Resolution up to 0.2 mm, Wireless technology with an in-built touchscreen and battery, Extended field of view for capturing both large and small objects	4,5

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Elementary Engineering Mathematics	B. S. Grewal	Khanna Publishers,15th Edition. ISBN: 978-81-7409-257-1
2.	Engineering Mathematics (Third edition)	Croft, Anthony	Pearson Education, New Delhi, 2014. ISBN 978-81-317-2605-1
3.	Calculus and Its Applications	Marvin L. Bittinger David J. Ellenbogen Scott A. Surgent	Addison-Wesley 10th Edition ISBN-13: 978-0-321-69433-1
4.	Calculus and Analytic Geometry	G. B. Thomas, R. L. Finney	Addison Wesley, 9th Edition, 1995. ISBN 978-8174906168
5.	Advanced Engineering Mathematics	Krezig, Ervin	Wiley Publ., New Delhi,2014, ISBN: 978-0-470-45836-5
6.	Understanding Engineering Mathematics	John Bird	Routledge; First Edition ISBN 978-0415662840
7.	Indian Mathematics Engaging with the World from Ancient to Modern Times	George Gheverghese Joseph	World Scientific Publishing Europe Ltd. 57ISBN 978-17-86340-61-0
8.	A Modern Introduction to Ancient Indian Mathematics	T.S. Bhanumurthy	New Age International Private Limited, 1 January 2008 ISBN- 10. 812242600X, ISBN- 13. 978-8122426007
9.	Mathematics-I	Deepak Singh	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-42-4
10.	Mathematics-II	Garima Singh	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-52-3
11.	Sansar Ke Mahan Ganitagya	Gunakar Muley	First Edition, Rajkamal Prakashan, ISBN-10. 8126703571, ISBN-13. 978-8126703579.
12.	Consider Dimension and Replace Pi	M.P. Trivedi and P.Y. Trivedi	Notion Press; 1st edition (2018), ISBN: 978-1644291795

(b) Online Educational Resources:

1. https://ocw.mit.edu/
2. https://tutorial.math.lamar.edu/
3. https://www.khanacademy.org/
4. https://www.feynmanlectures.caltech.edu/
5. https://www.wolframalpha.com/
6. https://www.dplot.com/
7. https://www.geogebra.org/
8. https://www.easycalculation.com/
9. https://www.scilab.org/
10. https://www.desmos.com/
11. https://nptel.ac.in/
12. https://swayam.gov.in/
13. https://ndl.iitkgp.ac.in/
14. https://parakh.aicte-india.org/
15. https://ekumbh.aicte-india.org/
16. https://learnengg.com/LE/Index

Note: Teachers are requested to check the Creative Commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Online Mathematics Courses.
2. Mathematics Communities and Forums.
3. Mathematics Journals.
4. Mathematics Podcast.
5. Mathematics Tutorials.
6. Mathematics Quizzes.
7. Mathematics Animation.
8. Mathematics Simulations.
9. Mathematics Games.
10. Mathematics Puzzles.
11. Mathematics Brain Teasers.
12. Mathematics Apps.
13. Mathematics Blog.

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A) Course Code : **2450106 (P2450106/S2450106)**

B) Course Title : Workshop Practice for Tailoring and Fashion Design

C) Pre- requisite Course(s) :

D) Rationale :

Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical skills required by the technician working in the various apparel industries and Fashion studios. This course is designed to impart knowledge of basic work in apparel industries such as hand embroidery, hand and machine sewing to perform duties in industries. Students are able to perform various operations using hand tool, equipment and machines in apparel industries. Working in workshop also develops the attitude of group working and safety awareness.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/ laboratory/ workshop/ field/ industry.

After completion of the course, the students will be able to-

CO-1 Use tools required for tailoring effectively.
CO-2 Create samples of joining fabric using appropriate seams.
CO-3 Create samples of different types of fullness techniques.
CO-4 Use appropriate tools and materials required for embroidery.
CO-5 Create samples of basic stitches using hand embroidery.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes(POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	1	-	-	3	-	1	1		
CO-2	1	-	-	3	-	1	1		
CO-3	1	-	-	3	-	1	1		
CO-4	1	-	-	3	-	1	1		
CO-5	1	-	-	3	-	1	3		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	No tional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2450106	Workshop Practice for Tailoring and Fashion Design	-	-	04	02	06	03

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment(LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2450106	Workshop Practice for Tailoring and Fashion Design	--	--	20	30	20	30	100

Legend:

PTA: Progressive Theory Assessment in classroom (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units:

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 1a. Identify types of sewing machine and its parts. *TSO 1b.* Select various measuring tools. *TSO 1c.* Select various marking tools. *TSO 1d.* Select various cutting tools. *TSO 1e.* Use various sewing tools. *TSO 1f.* Use suitable tailoring tool in a given situation. *TSO 1g.* Take care and maintain the sewing machine.	**Unit- 1.0 Sewing Machine and Tools for Tailoring** 1.1 Types of sewing machine and its parts: Half Shuttle sewing machine, Full Shuttle sewing machine. 1.2 Care & Maintenance of sewing machine. 1.3 Function and uses of the Measuring tools: Measuring tape, Tailor's square, Yardstick, Clear ruler (see through ruler), French curve Set, Setsquare, Flexible Curve Rulers, Sewing gauge 1.4 Function and uses of the Marking tools: Chalk pencil, Pencil, Fiber pens, Disappearing pens, Children's washable markers, Tracing wheel, Fabric carbon paper, Tailor's chalk, Pattern notcher, Marking with soap 1.5 Function and uses of the cutting tool: Small scissor, Big shears, Thread trimmers, Pinking shears, Stitch opener, Rotary cutter, Surgical blades, Awl 1.6 Function and uses of the sewing tools: Bobbin &Bobbin case, Machine sewing needles Hand sewing needles	**CO1**
TSO 2a. Define seam *TSO 2b.* Explain properties of seam. *TSO 2c.* Prepare samples of hand stiches. *TSO 2d.* Prepare sample of seam types.	**Unit-2.0- Stitches & Seams** 2.1 Definition of seam, Properties of seam 2.2 Hand stitches: Basting (Even basting, Uneven basting), Running stitch, Different types of hemming stitches (Blind hemming stitch, Simple hemming stitch) 2.3 Seam types: Plain Seam, Curved Seam , Cornered, To join an inward corner , Trimming, To trim corner, Clipping, Hand overcast, Zigzagged , Bias bound , Net bound, French seam , Flat felled seam, Self-bound seam, Corded seams, Lapped seams , Fagotted seam, Double top stitched seam, Welt seam, Tuck seam, Slot seam, Seaming special fabrics, (Velvet, Net, Georgette	**CO2**
TSO 3a. Define fullness. *TSO 3b.* List types of fullness. *TSO 3c.* Prepare sample of fullness.	**Unit-3.0 Fullness** 3.1 Definition of fullness and its types: Darts, Tucks, Pleats, Gathering, Shirring, Smocking, Ruffles	**CO3**
TSO 4a. Describe the origin of embroidery. *TSO 4b.* Describe the importance of embroidery. *TSO 4c.* Select various tools required for hand embroidery *TSO 4d.* Select appropriate fabric required for hand embroidery	**Unit-4.0 Hand Embroidery, Tools and Materials for Hand Embroidery** 4.1 Origin of embroidery and development of embroidery. 4.2 Importance of embroidery	**CO4**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 4e. Use suitable thread of hand embroidery in a given design *TSO 4f.* Select appropriate accessories with embroidery	4.3 Selection use and maintenance of tools and equipment for embroidery 4.4 Various threads used in embroidery. 4.5 Accessories used in embroidery, Various types of Needles and fabrics with its impact on quality parameters.	
TSO 5a. Identify Types of Design *TSO 5b.* Explain importance of design. *TSO 5c.* Use structural and Decorative design on apparel *TSO 5d.* Apply structural and decorative design on apparel *TSO 5e.* Create reduction and enlargement of design.	**Unit-5.0 Types of Basic hand Embroidery Stitches.** 5.1 Back stitch, Stem Stitch, Blanket stitch, Chain stitch 5.2 Laid and Couching /cording, Cross stitch, Feather stitch / Fly stitch, Satin stitch 5.3 Lazy –daisy stitch, Bullion and French knot 5.4 Long and short stitch, Herring bone	**CO5**

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2450106

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 1.1 Identify types of sewing machine and its parts	1.	Prepare a labeled outline diagram of sewing machine	CO1
LSO 2.1 Select various measuring tools.	2.	Draw neat sketch of measuring tools used for tailoring.	CO1
LSO 3.1 Select various marking tools	3	Draw neat sketch of marking tools used for tailoring.	CO1
LSO 4.1 Select various cutting tools	4	Draw neat sketch of cutting tools used for tailoring.	CO1
LSO 5.1 Use various sewing tools	5	Draw neat sketch of sewing tools used for tailoring.	CO1
LSO 6.1 Use suitable tailoring tool in a given situation.	6	Take body measurement of another person and note it in the file.	CO1
LSO 7.1 Use suitable tailoring tool in a given situation.	7	Take measurement of readymade garment and note it in the file.	CO1
LSO 8.1 Prepare samples of hand stiches.	8	Prepare samples of basic hand stitch.	CO2
LSO 9.1 Prepare sample of seam types.	9	Prepare samples of seams to join fabric.	CO2
LSO 10.1 Prepare sample of fullness.	10	Prepare samples of fullness technique.	CO3
LSO 11.1 Select various tools required for hand embroidery.	11	Draw neat sketches of embroidery tool.	CO4
LSO 12.1 Prepare sample of basic embroidery.	12	Prepare samples of Basic embroidery.	CO5

L) **Suggested Term Work and Self Learning: S2450106** Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

1. Write problem solving remedies after observing problem of sewing machine.
2. Collect the picture of different seams from internet.
3. Collect the picture of different fullness from internet.
4. Collect the picture of different tool of embroidery from internet.
5. Draw any five combined stitch design for embroidery on a sheet.

b. Micro Projects:

1. Prepare a chart of tool required for sewing and cutting.
2. Make an article in which more than five seams are used.
3. Make an article in which fullness technique is used.
4. Prepare a chart of tools and materials used for hand embroidery.
5. Prepare female hand kerchief with 1"X 1" basic stitch embroidery motif.

c. Other Activities:

1. Visit nearby garment workshop and collect information about operation performed by identified workshop and prepare the list of tools and equipment used for tailoring.
2. Select any one garment and perform the measurement using suitable measuring tools.
3. Select any three different readymade garment and prepare list of different types seam used in selected garments.
4. Select any five different readymade garment and prepare list of different techniques used for fullness in selected garment.
5. Collect the different type of accessories and material for basic embroidery.
6. Collect 5 design from internet for combine basic stitch and label the stitch name.

M) **Suggested Course Evaluation Matrix:** The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate **CO attainment**.

Cos	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	--	--	**20%**	20%	20%	15%	20%
CO-2	--	--	20%	20%	20%	20%	20%
CO-3	--	--	20%	20%	20%	25%	20%
CO-4	--	--	20%	20%	20%	10%	20%
CO-5	--	--	20%	20%	20%	30%	20%
Total Marks			**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: (Not Applicable)

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Prepare a labeled outline diagram of sewing machine.	CO1	60	30	10
2.	Draw neat sketch of measuring tools used for tailoring.	CO1	60	30	10
3.	Draw neat sketch of marking tools used for tailoring.	CO1	60	30	10
4.	Draw neat sketch of cutting tools used for tailoring.	CO1	60	30	10
5.	Draw neat sketch of sewing tools used for tailoring.	CO1	60	30	10
6.	Take body measurement of another person and note it in the file.	CO1	60	30	10
7.	Take measurement of readymade garment and note it in the file.	CO1	60	30	10
8.	Prepare samples of basic hand stitch.	CO2	30	60	10
9.	Prepare samples of seams to join fabric.	CO2	30	60	10
10.	Prepare samples of fullness technique.	CO3	30	60	10
11.	Draw neat sketches of embroidery tool.	CO4	30	60	10
12.	Prepare samples of Basic embroidery.	CO5	60	30	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/practical to assess the student performance.

P) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Field Trips, Portfolio Based, Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field Information and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/Practical Number
1.	Tailoring Kit	Measuring tool, marking tool, cutting tool and sewing devices.	1 to 10
2.	Sewing Machine	Half shuttle and full shuttle sewing machine	1 to 10
3.	Embroidery Kit	Embroidery tool and material	11 &12

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Visual Design in dress	Marian L Davis	Prentice Hall, Upper Saddle River, NJ 07458. ISBN: 0-13-112129-4
2.	The Art of Sewing	Anna Jacob Thomas	UBS Publishers Distributers Limited, New Delhi. ISBN: 81-85944-75-X
3.	Pattern Making for Fashion Design	Helen Joseph - Armstrong	Pearson Education, New Delhi – 110092. ISBN: 81-297-0925-2
4.	New Complete Guide to Sewing		Reader's Digest, Canada. ISBN: 0-7621-0420-1
5.	Fashion Terms and Styles for Women's Garments	A. W. Koester & N.O. Bryant	Wiley India, New Delhi. ISBN: 9788126518951

(b) Online Educational Resources:

1. https://youtu.be/r_lcrOM78Xc
2. https://youtu.be/K27m4KfNUWE
3. https://youtu.be/010nr2avsiE
2. https://youtu.be/Pfd7I7M0akY
3. https://youtu.be/txEsN68ozZw
4. https://youtu.be/go89e8xpVYs

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. https://ncert.nic.in/vocational/pdf/ivsm103.pdf
2. https://cbseacademic.nic.in/web_material/publication/cbse/39GarmentConstruction-II-XII.pdf
3. Lab Manuals

******

A) Course Code : 2418107 (P2418107/S2418107)

B) Course Title : ICT Tools

(CE, ME, ME (Auto), FTS, CSE, AIML, MIE, CRE, CHE, FPP, TE, CACDDM, GT)

C) Pre- requisite Course(s) :

D) Rationale :

Besides working in technical environment in their profession, diploma pass outs may also get involved in routine office task related to creating business documents, perform data analysis and its graphical representations, making presentations. In order to carry-out these works, the students need to learn various desk-top based and internet-based software tools such as- office automation applications like word processing, spreadsheets and presentation tools. They also need to use these tools for making their project reports and presentations during their graduation programme. The objective of this course is to develop the basic competency in students for using these office automation tools to accomplish the job.

E) Course Outcomes (Cos): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/ laboratory/ workshop/ field/ industry.

After completion of the course, the students will be able to-

CO-1 Prepare business document using word processing tool.
CO-2 Manipulate data and represent it graphically using spreadsheet.
CO-3 Prepare professional slide-based presentations.
CO-4 Work effectively with Internet and basic web services

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	1	2	2	2	-	2	-		
CO-2	2	2	2	2	-	1	-		
CO-3	1	2	2	2	-	-	-		
CO-4	1	2	2	2	3	1	2		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2418107	ICT Tools	-	-	04	02	06	03

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self Learning Assessment (TWA)		Lab Assessment (LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2418107	ICT Tools	-	-	20	30	20	30	100

Legend:

PTA: Progressive Theory Assessment in classroom (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units:

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
–	**Unit-1.0** **Word Processing** **1.0 Word Processing:** Overview of Word processor Basics of Font type, size, colour, Effects like Bold, italic, underline, Subscript and superscript, Case changing options, previewing a document, saving a document, closing a document and exiting application. **1.1 Editing a Document:** Navigate through a document, Scroll through text, Insert and delete text, Select text, Undo and redo commands, Use drag and drop to move text, Copy, cut and paste, Use the clipboard, Clear formatting, Format and align text, Formatting Paragraphs, Line and paragraph spacing, using FIND and REPLACE, Setting line spacing, add bullet and numbers in lists, add borders and shading, document views, Page settings and margins, Spelling and Grammatical checks **1.2 Changing the Layout of a Document:** Adjust page margins, change page orientation, Create headers and footers, Set and change indentations, Insert and clear tabs. **1.3 Inserting Elements to Word Documents**: Insert and delete a page break, Insert page numbers, Insert the date and time, Insert special characters (symbols), Insert a picture from a file, Resize and reposition a picture **1.4 Working with Tables:** Insert a table, Convert a table to text, Navigate and select text in a table, Resize table cells, Align text in a table, Format a table, Insert and delete columns and rows, Borders and shading, Repeat table headings on subsequent pages, Merge and split cells. **1.5 Working with Columned Layouts and Section Breaks:** a Columns, Section breaks, Creating columns, Newsletter style columns, Changing part of a document layout or formatting, Remove section break, Add columns to remainder of a document, Column widths, Adjust column spacing, Insert manual column breaks.	**CO-1**
–	**Unit-2.0 Spreadsheets** **2.1 Working with Spreadsheets:** Overview of workbook and worksheet, Create Worksheet Entering data, Save, Copy Worksheet, Delete Worksheet, Close and open Workbook. **2.2 Editing Worksheet:** Insert data, adjust row height and column width, delete, move data, insert new rows and columns, Copy and Paste content, Find and Replace, Spell Check, sheet view Zoom In-Out, insert Special Symbols, Insert Comments, Add Text Box, Undo-redo Changes, - Freeze Panes, hiding/unhiding rows and columns. **2.3 Formatting Cells and sheet:** Setting Cell Type, Setting Fonts, Text options, Rotate Cells, Setting Colors, Text Alignments, Merge and Wrap, apply Borders and Shades, Sheet Options, Adjust Margins, Page Orientation, insert Header and Footer, Insert Page Breaks, Set Background. **2.4 Working with Formula:** Creating Formula, absolute and relative cell references, Copying and pasting Formula, Common spreadsheet Functions such as sum, average, min, max, date, In, And, or, mathematical functions such as sqrt, power, statistical functions, applying conditions using IF.	**CO-2**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
	2.5 Working with Charts: Introduction to charts, overview of different types of charts, Bar, Pie, Line charts, creating and editing charts. Using different chart options: chart title, axis title, legend, data labels, Axes, grid lines, moving chart in a separate sheet. **2.6 Advanced Operations:** Applying Conditional Formatting, Data Filtering, Data Sorting, Using Ranges, Data Validation, Adding Graphics, Printing Worksheets, print area, margins, header, footer and other page setup options.	
–	**Unit-3.0 Presentation Tool** **3.1 Creating a Presentation:** Outline of an effective presentation, Identify the elements of the User Interface, Starting a New Presentation Files, Creating a Basic Presentation, Working with textboxes, Apply Character Formats, Format Paragraphs, View a Presentation, Saving work, creating new Slides, Changing a slide Layout, Applying a theme, Changing Colours, fonts and effects, apply custom Colour and font theme, changing the background, Arrange Slide sequence, **3.2 Inserting Media elements:** Adding and Modifying Graphical Objects to a Presentation - Insert Images into a Presentation, insert audio clips, video/animation, Add Shapes, Add Visual Styles to Text in a Presentation, Edit Graphical Objects on a Slide, Format Graphical Objects on a Slide, Group Graphical Objects on a Slide, Apply an Animation Effect to a Graphical Object, Add Transitions, Add Speaker Notes, Print a Presentation. **3.3 Working with Tables:** Insert a Table in a Slide, Format Tables, and Import Tables from Other Office Applications. **3.4 Working with Charts:** Insert Charts in a Slide, modify a Chart, Import Charts from Other Office Applications.	**CO-3**
–	**Unit-4.0 Basics of Internet** **4.1 World Wide Web**: Introduction, Internet, Intranet, URL, web servers, basic settings of web browsers- history, extension, default page, default search engine, privacy and security, creating and retrieving bookmarks, use search engines effectively for searching the content. **4.2 Web Services**: Cloud- software as service (SAS), Google docs, slides, sheets, Form, Web Sites, web pages, e-Mail, Chat, Video Conferencing, e-learning, e-shopping, e-Reservation, e-Groups, Social Networking	**CO-4**

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2418107

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant Cos Number(s)
LSO 1.1. Perform fundamental word processing operations to create a document	1.	a) Create, edit and save document: apply formatting features on the text – line, paragraph b) Use bullets, numbering, page formatting, header, footer, margin, layout	CO-1
LSO 2.1. Work with images/shapes in a document	2.	Insert and edit images and shapes, resizing, cropping, colour, background, group/ungroup	CO-1
LSO 3.1. Organize data in tabular form in a document	3.	Insert table and apply various table formatting features on it.	CO-1
LSO 4.1. Perform Document proofing operations in a document	4.	Review features such as Spelling, grammar, Thesaurus, translate, language, word count, comments	CO-1
LSO 5.1. Organize and print Document	5.	Apply page layout features i. Print layout, web layout, show ruler, gridline, page zoom, split ii. Themes, page background, paragraph, page setup iii. Create multicolumn page iv. Use different options to print the documents	CO-1
LSO 6.1. Create batch of documents with tailored variable information using mail merge	6.	Use mail merge operation with options.	CO-1
Spreadsheets			
LSO 7.1. Create a worksheet *LSO 7.2.* Format sheet/cell	7.	Create, open and edit worksheet i. Enter data and format it, adjust row height and column width ii. Insert and delete cells, rows and columns. iii. Apply Format cell, wrap text, number format, orientation feature on cell.	CO-2
LSO 8.1. Perform fundamental calculation operations in a worksheet	8.	Insert formulas, absolute and relative cell reference, “IF” conditions, built-in functions and named ranges in worksheet.	CO-2
LSO 9.1. Filter the given data set *LSO 9.2.* Validate data based on criteria *LSO 9.3.* Sort the data in given order	9.	Apply conditional formatting, data Sorting, Data Filter and Data Validation features.	CO-2
LSO 10.1. Create various types of charts to represent data in graphical form	10.	Create different charts, apply various chart options.	CO-2
LSO 11.1. Print worksheet as per given layout	11.	Apply Page setup and print options on worksheet to print the worksheet.	CO-2
Presentation Tools			
LSO 12.1. Create electronic slide show containing text, image, shape, table, charts objects	12.	Create slide presentation i. Apply design themes to the given presentation ii. Add new slides and insert text, pictures/images, shapes iii. Add tables and charts in the slides	CO-3
LSO 13.1. Run slide presentation in different modes *LSO 13.2.* Print slide presentation	13.	i. Run slide presentation in customize form/modes ii. Print slide presentation as sheet, handouts using various print options	CO-3

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant Cos Number(s)
LSO 14.1. Apply given animation effects to the text and slides.	14.	Apply different animation effects to the text and slides with given options.	CO-3
LSO 15.1. Add audio and video files in the presentation	15.	Add some sample audio and video files in the presentation and format the same with various options available.	CO-3
Internet Basics			
LSO 16.1. Configure internet and browser setting	16.	a) Configure Internet connection b) Configure browser settings and use browsers	CO-4
LSO 17.1. Use different internet services	17.	a) Use internet for different web services, such as, chat, email, video conferencing, etc.	CO-4
LSO 18.1. Work with Google Doc	18.	Work with Google Doc for creating collaborative documents on cloud	CO-4
LSO 19.1. Work with google sheet	19.	Work with google sheet for creating collaborative spreadsheets on cloud	CO-4
LSO 20.1. Work with google slides	20.	Work with google slides for creating collaborative slide presentation on cloud	CO-4
LSO 21.1. Create google form	21.	a) Create google form for a sample survey b) Through google forms collect user's response, download it in csv format, analyse it and represent data/trend through graphs and present it.	CO-4, CO3

L) **Suggested Term Work and Self Learning: S2418107** Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

b. Micro Projects:

i. **Word documents**: prepare documents such as Time Table, Application, Notes, Reports. (Subject teacher shall assign a document to be prepared by each student)

ii. **Slide Presentations:** Prepare slides with all Presentation features such as: content presentation, presentation about department, presentation of reports. (Subject teacher shall assign a presentation to be prepared by each student).

iii. **Spreadsheets:** Prepare statements such as Pay bills, tax statement, student's assessment record using spreadsheet- perform statistical analysis, sorting and filtering operations, represent data through various types of charts. (Teacher shall assign a spreadsheet to be prepared by each student).

c. Other Activities: ---

M) **Suggested Course Evaluation Matrix:** The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and sessional work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	-	-	15%	-	-	20%	20%
CO-2	-	-	10%	25%	-	10%	20%
CO-3	-	-	15%	25%	33%	15%	20%
CO-4	-	-	30%	25%	33%	15%	20%
CO-5	-	-	30%	25%	34%	40%	20%
Total Marks	-	-	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: (Not Applicable)

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	a) Create, edit and save document: apply formatting features on the text - line, paragraph b) Use bullets, numbering, page formatting, header, footer, margin, layout	CO-1	60	30	10
2.	Insert and edit images and shapes, resizing, cropping, colour, background, group/ungroup	CO-1	60	30	10
3.	Insert table and apply various table formatting features on it.	CO-1	60	30	10
4.	Review features such as Spelling, grammar, Thesaurus, translate, language, word count, comments	CO-1	70	20	10
5.	Apply page layout features i. Print layout, web layout, show ruler, gridline, page zoom, split ii. Themes, page background, paragraph, page setup iii. Create multicolumn page iv. Use different options to print the documents	CO-1	60	30	10
6.	Use mail merge operation with options.	CO-1	60	30	10
7.	Create, open and edit worksheet i. Enter data and format it, adjust row height and column width ii. Insert and delete cells, rows and columns. iii. Apply Format cell, wrap text, number format, orientation feature on cell.	CO-2	60	30	10

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
8.	Insert formulas, absolute and relative cell reference, "IF" conditions, built-in functions and named ranges in worksheet.	CO-2	60	30	10
9.	Apply conditional formatting, data Sorting, Data Filter and Data Validation features.	CO-2	60	30	10
10.	Create different charts, apply various chart options.	CO-2	30	60	10
11.	Apply Page setup and print options on worksheet to print the worksheet.	CO-2	30	60	10
12.	Create slide presentation i. Apply design themes to the given presentation ii. Add new slides and insert text, pictures/images, shapes iii. Add tables and charts in the slides	CO-3	40	50	10
13.	i. Run slide presentation in customize form/modes ii. Print slide presentation as sheet, handouts using various print options	CO-3	30	60	10
14.	Apply different animation effects to the text and slides with given options.	CO-3	60	30	10
15.	Add some sample audio and video files in the presentation and format the same with various options available.	CO-3	60	30	10
16.	a) Configure Internet connection b) Configure browser settings and use browsers	CO-4	70	20	10
17.	Use internet for different web services, such as, chat, email, video conferencing, etc.	CO-4	70	20	10
18.	Work with Google Doc for creating collaborative documents on cloud	CO-4	60	30	10
19.	Work with google sheet for creating collaborative spreadsheets on cloud	CO-4	60	30	10
20.	Work with google slides for creating collaborative slide presentation on cloud	CO-4	60	30	10
21.	i. Create google form for a sample survey ii. Through google forms collect user's response, analyze it and represent data/trend through graphs and present it.	CO-4, CO-3	60	30	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/practical to assess the student performance.

P) Suggested Instructional/Implementation Strategies: Different Instructional/ ImplementationStrategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Portfolio Based Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field, Information and Communications Technology (ICT) Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Sessions, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/Practical Number

1.	Computer system with internet connection	(Any computer system with basic configuration)	All
2.	Office application	Such as- Microsoft Office 365/ Microsoft Office 2019 or latest	All

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Microsoft Office 2019 For Dummies Paperback – 1 January 2018	Wallace Wang	Wiley (1 January 2018), ISBN-10: 8126578556 ISBN-13: 978-8126578559
2.	Office 2019 In Easy Steps	Michael Price	BPB Publications; First edition (1 January 2019), ISBN-10: 938851114X ISBN-13: 978-9388511148
3.	MS OFFICE 2016 ADVANCED LEVEL Basic Computer Concept In Hindi A Complete Book For MS OFFICE 2016 IN Hindi Language	Rakesh Sangwan	ASCENT PRIME PUBLICATION; 2022nd edition (1 January 2021)

(b) Online Educational Resources:

2. Gain essential skills in Office 2019 and 365: (https://edu.gcfglobal.org/en/topics/office/)
3. Microsoft 365 basics video training: (https://support.microsoft.com/en-us/office/microsoft-365-basics-video-training-396b8d9e-e118-42d0-8a0d-87d1f2f055fb)

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

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A) Course Code : **2400008 (P2400008/S2400008)**

B) Course Title : Sports, Yoga and Meditation (Common for all Programmes)

C) Pre- requisite Course(s) :

D) Rationale

Sports or Physical Education, Yoga and Meditation is an integral part of a person's overall well-being and is imperative for a healthy mind and body balance. So, it is necessary that every educational institute should lay ample emphasis on including sports, yoga and meditation as a necessary part of education, however, it depends on how it is introduced in the curriculum makes all the difference. Sports, Yoga and Meditation plays a very important role in overall Well-being for a good personality, develops value system, sense of friendliness, feeling of togetherness thereby developing team spirit and mutual cooperation. It also plays a major role in reducing level of stress/anxiety and add to the mental toughness. Looking to the ample benefits there is need to inculcate sports, Yoga and meditation as a day-to-day habit and imparting education related to physical education is more critical than ever before.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/ laboratory/ workshop/ field/ industry.

After completion of the course, the students will be able to-

CO-1 Select appropriate physical activities to maintain healthy lifestyle.

CO-2 Apply basic principles and practices of Yoga and meditation for overall growth & development.

CO-3 Use fitness and wellness techniques for optimal health and wellbeing.

CO-4 Apply ancient Indian ayurvedic methods and techniques, exercises, yoga and meditation for fitness and wellness.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Develop-ment of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Managem ent	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	3	3	-	1	-	2		
CO-2	3	3	3	-	1	-	2		
CO-3	3	3	3	-	1	-	2		
CO-4	3	2	1	-	1	-	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2400008	Sports, Yoga and Meditation	-	-	01	01	02	01

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2400008	Sports, Yoga and Meditation	-	-	10	-	06	09	25

Legend:

PTA: Progressive Theory Assessment in classroom (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units:

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO.1a Explain ancient history and development of yoga in India *TSO.1b* Compare the ancient Indian games with the modern games. *TSO.1c* Differentiate between given terms used in sports *TSO.1d* Describe the different aspects of Mental Toughness *TSO.1e* Use Imagery Training for sports *TSO.1f* Apply motivation techniques to motivate students in sports. *TSO.1g* Use concentration techniques for playing and exercising. *TSO.1h* Manage Stress, Anxiety and Arousal during sports. *TSO.1i* Select sports and exercise for healing and developing health and mental wellness *TSO.1j* Describe the impact of parents' involvement in their children's sports activities *TSO.1k* Select sports and exercises for physically challenged as per their need.	**Unit-1.0 Sports and Exercises** 1.1 Historical development of physical activities and sports in India, Indian ancient games- Kho-Kho and Kabaddi, Chariot races, riding elephants and horse, swordsmanship, wrestling, boxing, atyapatya, archery, dancing, dands baithak, malkhamb, lezim, lathi etc 1.2 Origin of traditional sports, 3rd century BCE-martial arts and archery, indoor games like Chess and Snakes & Ladders have origins in ancient India, in the form of games of Chaturanga and Gyan Chauper, 1.3 Dholavira, the world's oldest terraced arena 3000 BC 1.4 Definition of play, game, sports, exercise, psychology, sports psychology and exercise psychology, psychology and common sense. 1.5 Mental toughness- mind, Imagery, use of imagery and imagery in sports, types of imagery (visual, kinesthetic, auditory and olfactory) 1.6 Motivation in sport and goalsetting in sports 1.7 Arousal regulation – self-awareness of regulation, anxiety reduction techniques-somatic anxiety reduction techniques, cognitive Anxiety reduction, multimodal anxiety reduction, coping with stress. Arousal -inducing techniques. Arousal and anxiety measurement factors, Arousal and anxiety signs recognition 1.8 Nutrition and rehabilitation, Importance of concentration and attentional focus in sports and training, Impact of health on healing from physical athletic injuries. Impact of exercise to increase mental wellness, Role of coach in sports, parents' involvement in their children's sports activities. 1.9 Adaptation of sports and exercises for physically challenged students in all levels.	**CO1, CO4**
TSO.2a Explain ancient history and development of yoga in India *TSO.2b* Identify the physiology of yoga and meditation. *TSO.2c* Evaluate meditation and yoga as a healing modality. *TSO.2d* Select asanas and pranayama as per need. *TSO.2e* Describe the effect of yoga and meditation on ageing, stress and hypertension. *TSO.2f* Select mediation techniques as per the need. *TSO.2g* Explain Bandha, Mudra and Chakra *TSO.2h* Enumerate the steps of Suryanamaskar. *TSO.2i* Select Yoga and Meditation for physically challenged as per their need.	**Unit-2.0 Yoga and Meditation** 2.1 Origin of yoga, History and development of yoga, Adi yogi, evidences of yoga in pre-Vedic period (2700 B.C.), Vedic Period, Pre-Classical Period, Classical Period- Patanjali's period, Modern Period. 2.2 Yoga practices and the related literature-Vedas (4), Upanishads (108), Smritis, teachings of Buddhism, Jainism, Panini, Epics (2), Puranas (18) 2.3 Importance of Yoga & Mediation, meaning of the term Yoga and Meditation, Fundamentals Principles of Yoga & Fitness training, Eight Limbs of Yoga	**CO2, CO4**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
	2.4 Difference between yoga asana and physical exercises, Difference between yoga and meditation 2.5 Role of Yoga and Meditation in Purificatory Process, in character building, developing concentration, will power and discipline 2.6 Types of Yoga Practices - Asanas, Pranayama, Meditation 2.7 Mindfulness – knowing the mind, training the mind, feeling the mind 2.8 Different Methods of meditation, Physiology of meditation, Mental, physical and emotional benefits of Asanas, Pranayama, Concentration and Meditation 2.9 Bandha, Mudra and Chakra 2.10 Effects of Asanas and pranayama on physiology of human body 2.11 Importance of "Suryanamaskar 2.12 Adaptation of Yoga and meditations for physically challenged students in all levels. 2.13 Yoga Asanas Do's and Don'ts for Beginners	
TSO.3a Explain the ancient Indian ayurvedic methods for fitness and wellness *TSO.3b* Identify the different factors affecting the fitness and wellness in the given situation *TSO.3c* Use different methods to maintain Health and Wellness *TSO.3d* Explain the components of Balance Diet *TSO.3e* Identify the causes of stress and anxiety in the given situation *TSO.3f* Use stress reduction techniques to manage Stress and Anxiety *TSO.3g* Manage Stress, Anxiety and Depression in the given situation *TSO.3h* Select recovery process for energy replenishment after exercise.	**Unit 3.0 Fitness and Wellness** 3.1 Evolution of wellness, 3,000-1,500 BC: Ayurveda –holistic system, Tailored Ayurvedic regimens as per unique constitution of each person (their nutritional, exercise, social interaction and hygiene needs) – with the goal of maintaining a balance that prevents illness. 3.2 Meaning, Importance, Definition and dimensions of Health and Wellness (WHO/Yoga) 3.3 Factors affecting Fitness and Wellness 3.4 Role of Physical Activities and Recreational Games in maintaining physiological and psychological wellbeing. 3.5 Different Methods to Maintain Health, Wellness and to enhance mood 3.6 Nutrition for Health & Wellness, Relationship between Diet and Fitness Components of Balance Diet and its importance – Carbohydrates, Protein, Fat, Vitamins & Minerals, Water, Healthy Lifestyle through Diet and Fitness 3.7 Anxiety, Stress and Aging-Meaning of Anxiety, Stress and Aging, Types and Causes of Stress, 3.8 Stress, anxiety and depression reduction with exercise, yoga and meditation 3.9 Energy Continuum and Recovery Process, Metabolism and exercise, Recovery from exercise, Replenishment of energy stores during recovery process, Removal of excess lactic acid produced during exercise	**CO3, CO4**

Note: One major TSO may require more than one Theory session/Period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2400008

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 1.1. Perform various sports activities for overall growth and development *LSO 1.2.* Select suitable sport activities as per your need.	1.	Track & Field: Running, Jumping, walking and Throwing, Cycling Event to develop Endurance, Speed, Strength, Agility, Flexibility etc.	**CO1**
	2.	Aerobics and Gymnastics to develop Strength, Agility and Flexibility	
	3.	Net/Wall Sports – Volleyball and Basketball to develop Endurance, Speed, Strength, Agility and Flexibility	
	4.	Striking & Fielding sports like Cricket, bowling, Hockey, Football Baseball etc. to develop Endurance, Speed, Strength, Agility, Flexibility and Coordination	
	5.	Racket Game- Tennis, Badminton, Table tennis etc. to develop Endurance, Speed, Strength, Agility and Flexibility	
	6.	Outdoor games: Kho-Kho and Kabaddi and cycling develop Endurance, Speed, Strength, Agility and Flexibility	
	7.	Indoor games: Chess and Carrom, Swimming, Boxing, Karate Weightlifting, Power Lifting, Physique Training, Archery, Roller Skating etc. to develop concentration.	
	8.	Prepare and organize Adapted Sports for various levels of physically challenged and impairments.	
LSO 2.1 Perform various yogic techniques for internal purification and development.	9.	Shat Karmas: Tratakam, Jala-Neti, Sutra-Neti, Vamana Dhauti, Danda Dhauti, Agnisara, Nauli	**CO2**
	10.	Perform following asanas with correct posture: Ardha-Padmasana [virasana], Ardha-Halasana, Pavana-Muktasana, Naukasana, Ardha-shalabhasana, Shalabhasana, Makarasan, Bhujangasana, Dhanurasana	
	11.	Perform following asnas with correct posture: Vakrasana,Chakrasana,Paschimottanasana,Ugrasana,Gomukh asana, Padmasana, Siddhasana, Bhadrasana, Swastikkasana, Vajrasana, Supta-Vajrasana, Yoga-Mudra	
	12.	MUDRAS & SURIYANAMASKAR Brahma-Mudra, Simha-Mudra, Shanmugi Mudra, Viparithakarani-Mudra, Ashwsini-Mudra, Suriyanamaskar	
	13.	BANDHAS Jalandhara-Bandha, Jihva-Banda, Uddiyana Bandha, Moola-Bandha	
	14.	PRANAYAMAS Nadi-Shuddhi, Nadi-Shodhana, Suryabhadana, Ujjayi, Bhastrika Pranayama, Bhramari Pranayama, Sitkari , Sitali , Kapalabhati	
	15.	MEDITATION -Silent Meditation	
	16.	MEDITATION – Mantra Meditation	
LSO 3.1. Prepare diet chart for optimal health and wellbeing	17.	Prepare a diet chart for the given sport.	**CO3**
LSO 3.2. Use health monitoring device	18.	Measure heart rate and heart function with health monitoring device	
	19.	Measure blood sugar and blood pressure	

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant COs Number(s)
LSO 3.3. Use different equipment's	20.	Use massage therapy equipment, Hot and cold therapy equipment, Ultrasound therapy equipment	
LSO 3.4. Identify your own threshold and identification level for different taste Stimulations	21.	Determine the taste threshold for three different sensations-sweet salty and sour	
LSO 3.5. Check the given sample for conformance to the standard for moisture content.	22.	Determine the moisture content in the given sample of oil/fat	
LSO 3.6. Purity tests of oils/fats	23.	Determine the impurities in the given sample of oil.	
LSO 3.7. Acidity test in given sample of fat/oil	24.	Determines the acid value and free fatty acids in the given sample of oil/fat.	
LSO 3.8. Check whether any given samples of oils/fats conform to the standard.	25.	Determine the peroxide value in the given sample of fat or oil.	

L) Suggested Term Work/ Activities and Self Learning: S2400008 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

i. Calculate your Body Composition (BMI) and Cardiovascular Assessment.
ii. Assessment for Muscular Endurance, Muscular Strength.
iii. Flexibility, Cardio-respiratory Endurance, Body Composition.
iv. Rules and Regulations of different indoor and outdoor games.

b. Micro Projects:

i. Identify and synthesize the factors that influence health in various situations (05 situations). Prepare a report with details of situations and solutions to remove the factors.
ii. Visit different sports club, gyms, and schools and identify various measure taken by them for Fitness and wellness of students/ members
iii. Visit different sports club, gyms, and schools and identify various measure taken by them for Fitness and wellness of physically challenged students/ members
iv. Identify which type of stress, anxiety and depression students are facing and steps and solutions to overcome this.

c. Other Activities:

1. Seminar Topics:

- Identify the health-related challenges in current time and able to apply the preventive measures.
- Role of peers, community and media in health and wellbeing in each level
- Knowledge and skills required to preserve community health and well-being
- Effect of yoga and meditation in maintaining fitness.
- Methods to involve physically challenged students /members in all levels in sports, yoga and meditation in community.
- Counselling techniques to counsel players in matters of handling success and failure.

2. Visits: Visit nearby sports complex, Gyms, stadium etc and prepare a report on hygiene maintenance, medical facilities available, facilities available for physically challenged members, facilities available for old aged members, tools and equipment available and training facilities.

3. **Self-Learning Topics:**

- Anatomy and physiology of human being
- Role of Yoga and Meditation in Purificatory Process, in character building, developing concentration, will power and discipline
- Mindfulness
- Different Methods to Maintain Health, Wellness and to enhance mood
- Diet and Nutrition
- Metabolic adaptations to exercise
- Cardio-respiratory changes

M) Suggested Course Evaluation Matrix: The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate **CO attainment**.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	-	-	35%	-	-	35%	35%
CO-2	-	-	35%	-	-	35%	35%
CO-3	-	-	30%	-	-	30%	30%
Total Marks	-	-	10	-	-	06	09
			10				

Legend:
*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.
**: Mentioned under point- (N)
#: Mentioned under point-(O)

Note:
- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: (Not Applicable)

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Track & Field: Running, Jumping, walking and Throwing, Cycling Event to develop Endurance, Speed, Strength, Agility, Flexibility etc	CO1	30	60	10

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
2.	Aerobics and Gymnastics to develop Strength, Agility and Flexibility		30	60	10
3.	Net/Wall Sports – Volleyball and Basketball to develop Endurance, Speed, Strength, Agility and Flexibility		30	60	10
4.	Striking & Fielding sports like Cricket, bowling, Hockey, Football Baseball etc. to develop Endurance, Speed, Strength, Agility, Flexibility and Coordination		30	60	10
5.	Racket Game- Tennis, Badminton, Table tennis etc to develop Endurance, Speed, Strength, Agility and Flexibility		30	60	10
6.	Outdoor games: Kho-Kho and Kabaddi and cycling develop Endurance, Speed, Strength, Agility and Flexibility		30	60	10
7.	Indoor games: Chess and Carrom, Swimming, Boxing, Karate Weightlifting, Power Lifting, Physique Training, Archery, Roller Skating etc to develop concentration.		30	60	10
8.	Prepare and organize Adapted Sports for various levels of physically challenged and impairments.		30	60	10
9.	Shat Karmas Tratakam, Jala-Neti, Sutra-Neti, Vamana Dhauti, Danda Dhauti, Agnisara, Nauli	CO2	40	50	10
10.	Perform following asanas with correct posture: Ardha-Padmasana [virasana], Ardha-Halasana, Pavana-Muktasana, Naukasana, Ardha-shalabhasana, Shalabhasana, Makarasan, Bhujangasana, Dhanurasana		40	50	10
11.	Perform following asnas with correct posture: Vakrasana,Chakrasana,Paschimottanasana,Ugrasana,Gomukhasana, Padmasana, Siddhasana, Bhadrasana, Swastikkasana, Vajrasana, Supta-Vajrasana, Yoga-Mudra		40	50	10
12.	MUDRAS & SURIYANAMASKAR Brahma-Mudra, Simha-Mudra, Shanmugi Mudra, Viparithakarani-Mudra, Ashwsini-Mudra, Suriyanamaskar		40	50	10
13.	BANDHAS Jalandhara-Bandha, Jihva-Banda, Uddiyana Bandha, Moola-Bandha		40	50	10
14.	PRANAYAMAS Nadi-Shuddhi, Nadi-Shodhana, Suryabhadana, Ujjayi, Bhastrika Pranayama, Bhramari Pranayama, Sitkari , Sitali , Kapalabhati		40	50	10
15.	MEDITATION -Silent Meditation		40	50	10
16.	MEDITATION - Mantra Meditation		40	50	10
17.	Prepare a diet chart for the given sport.	CO3	40	50	10
18.	Measure heart rate and heart function with health monitoring device		40	50	10
19.	Measure blood sugar and blood pressure		40	50	10
20.	Use massage therapy equipment, Hot and cold therapy equipment, Ultrasound therapy equipment		40	50	10
21.	Determine the taste threshold for three different sensations-sweet salty and sour		40	50	10
22.	Determine the moisture content in the given sample of oil/fat		40	50	10

S. No.	Laboratory Practical Titles	Relevant COs Number(s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
23.	Determine the impurities in the given sample of oil.		40	50	10
24.	Determines the acid value and free fatty acids in the given sample of oil/fat.		40	50	10
25.	Determine the peroxide value in the given sample of fat or oil.		40	50	10

Note: -All the above Games can be selected from the list of SGFI/AIU/IOA

Legend:
PRA*: Process Assessment
PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/practical to assess the student performance.

P) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Field Trips, Portfolio Based, Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field Information and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/ Practical Number
1.	High end computers for record keeping	Processor Intel Core i7 with Open GL Graphics Card, RAM 32 GB, DDR3/DDR4, HDD 500 GB, Graphics Card NVIDIA OpenGL 4 GB, OS Windows 10	All
2.	Aerobics and Gymnastic	Basic facilities and equipment's – Balance Beams, Gymnastic Ball, Gymnastic Chalk, Gymnastic, Clubs, Flex Floor Systems, High Bars, Hoops, Horizontal Bars, Leotards, Music, Parallel Bar, Pommel Horses, Ribbons, Rings, Ropes, Sigle Bar Trainer, Spotting Blocks, Streamers, Trampoline, Tumble Track, Uneven Bar, Vault, Vault Spring Board Gymnastic Accessories – Chalk, Grips, Wrist Supports, Mat, Tape, Socks Singlets, Pants Shoes, Shorts Aerobics- Resistance bands, Jump rope, Step bench or box, Abdominal wheel, Exercise mat, Gliding discs, dumbbells, fitness trampolines, hoops	2
3.	Striking & Fielding sports	Complete Cricket Kit, Football Kit, Bowling Kit, Hockey Kit	4
4.	Net/Wall Sports	Complete Volley Ball and basketball kit	3
5.	Racket Game	Complete Tennis Kit, Table Tennis Kit and badminton kit	5
6.	Outdoor games	Complete Kho-Kho and Kabaddi and cycling kit	6
7.	Indoor games	Complete Chess kit, Carrom kit, Swimming kit, Boxing kit, Karate kit, Weightlifting kit, Power Lifting kit, Archery kit and Roller-Skating kit	7

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/ Practical Number
8.	Physique Training	Cardio Machines- Treadmills, Elliptical Trainers, Exercise Bikes, Rowing Machines, Indoor Bikes, Vibration Machines, Steppers Recumbents Dumbbells, Multi-Purpose Bench, power rack, Adjustable Dumbbell Set 2 x 3-10 kg, Exercise mat, resistance band, balance trainer	7
9.	Sports and wellbeing equipment's for physically challenged and impairments.	Fusion Wheel – all-in-one portable wheelchair gym, Pedal exerciser, Deluxe hand exerciser, Greeper sports shoelaces, Active Hands, Ramble Tag Guidance Aid, Cat Tongue Grip Tape **Adaptive Cycling**- Straps, Leg/ Foot Adapters, Prosthetics, Steering Dampener, Handlebar Adapters, HANDCYCLING- Wheelchairs, Bike-On Handcycles, Trikes, Racing Wheelchairs, Trikes, Recumbent Bikes, All-terrain Handcycles, Mono Cycling, Hand Bikes - Off-Road, Cross Country, Racing, Downhill **Archery -** Field Tripod and Quad Mounts (Archery & Gun), In-Line Draw-Loc, Mounts (Archery & Gun), Stands (Gun), Mounts (Archery & Gun) Binoculars and Rests (Gun), Crossbows (Archery), Wheelchair Platform Stabilizing Crutch Poles, Dampeners, Crossbows (Archery), Hands free shooting rest (Gun) Bowling: ramp, roll assist **Fitness**: Anti-Gravity Treadmill, LapMat for Wheelchairs, Strike Assist, Adaptive Treadmill	8
10.	Yoga	Yoga Mats, Yoga Rollers, Yoga Blocks, Aero Yoga Clothing Blankets, cloth Straps, Bolsters, Wheels	9-16
11.	Fitness and wellbeing equipment's	Health monitoring devices for overall healt- Personal health monitor for heart health, Blood sugar monitoring device, Wireless blood pressure device, Smart watch to track heart function, Hot and cold therapy equipment, Massage therapy equipment, Ultrasound therapy equipment	18-20
12.	Taste kit -To test three different sensations- sweet salty and sour	Salt solution (%) -0.5, 0.8, 1.0, 1.2, 1.5, Sugar solution (%) - 0.05, 0.5, 0.7, 1.0, 1.2, Citric acid (%) - 0.02, 0.04, 0.1, 0.5, 1.0 Spoons, Bowls, Beakers, Plain distilled water	21
13.	Test kit to measure peroxide value in the oil	Reagents: Acetic acid-chloroform solution, Saturated potassium iodide solution, Sodium thiosulphate solution- 0.1 N, Starch solution (1%) Apparatus: Pipette 1ml capacity, Conical flask	25
14.	Test kit to measure acid value and free fatty acids in the oil	Sample of oil/fats namely any refined oil or hydrogenated fat. Reagents - ethyl alcohol (95%), phenolphthalein indicator solution, standard aqueous sodium or potassium hydroxide solution (0.1 N or 0.5 N), Pipette (10 ml), Conical flask	24
15.	Test kit to measure impurities in the oil	Sample of Oil/fat, Oven-electric, maintained at 100 ± 1°C., Desiccator, Weighing balance, Filter paper	23
16.	Test kit to measure moisture content in the oil	Sample of oil/fat, Moisture dish-made of porcelain, silica, glass or aluminum, Oven-electric, maintained at 105 ± 1°C., Desiccator Weighing balance	22

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher with ISBN
1.	Practical Applications in Sports Nutrition	Heather Hedrick Fink, Alan E. Mikesky	Jones & Bartlett Learning (2020) ISBN No: 978-1284181340
2.	Massage and Medical Gymnastics,	Lace, M. V.	London: J & A Churchill Ltd. ASIN: B000RY4YB0
3.	ACSM's Guidelines for Exercise Testing and Prescription	Gary Liguori	LWW; (2021) ISBN-13: 978-1975150198

S. No.	Titles	Author(s)	Publisher with ISBN
4.	Essentials of Strength Training and Conditioning	Javair Gillett	Human Kinetics, (2021) ISBN-13: 978-1718210868
5.	Practical Applications in Sports Nutrition	Heather Hedrick Fink, Alan E. Mikesky	Jones & Bartlett Learning, (2017) ISBN-13: 978-1284101393
6.	Health Fitness Management	Mike Bates, Mike Spezzano, Guy Danhoff	Human Kinetics, (2019) ISBN-13: 978-1450412230
7.	Yoga for Every Body: A beginner's guide to the practice of yoga postures, breathing exercises and meditation	Luisa Ray, Angus Sutherland	Vital Life Books (2022) ISBN-13: 978-1739737009
8.	Science of Yoga: Understand the Anatomy and Physiology to Perfect Your Practice	Ann Swanson	DK Publisher, (2019) ISBN-13: 978-1465479358
9.	Mudras for Modern Living: 49 inspiring cards to boost your health, enhance your yoga and deepen your meditation Cards	Swami Saradananda	Watkins Publishing (2019) ISBN-13: 978-1786782786
10.	Principles and Methods of Adapted Physical Education & Recreation	Kristi Roth, Laurie Zittel, Jean Pyfer, David Auxter	Jones & Bartlett Learning, (2016) ISBN-13: 978-1284077810
11.	Adapted Physical Education and Sport Sixth Edition	Joseph P. Winnick, David L. Porretta	Human Kinetics, (2016) ISBN-13: 978-1492511533
12.	Counselling Skills in Applied Sport Psychology: Learning How to Counsel	Paul McCarthy, Zoe Moffat	Routledge, (2023) ISBN-13: 978-1032592589
13.	Basic Counselling Skills: A Helper's Manual	Richard Nelson Jones	Sage Publication 2012, New Delhi.
14.	Advancements in Mental Skills Training (ISSP Key Issues in Sport and Exercise Psychology)	Maurizio Bertollo, Edson Filho, Peter Terry	Routledge, (2020) ISBN-13: 978-0367111588
15.	The Relaxation and Stress Reduction Workbook	Martha Davis, Elizabeth Robbins, Matthew McKay, Eshelman MSW	A New Harbinger Self-Help Workbook (2019)
16.	Patanjalis Yoga Sutras	Swami Vivekananda	Fingerprint Publishing (2023) Prakash Books India Pvt Ltd, New Delhi, ISBN-13: 978-9354407017

(b) Online Educational Resources:

1. https://onlinecourses.swayam2.ac.in/aic19_ed28/preview- introduction to Yoga and Applications of Yoga
2. https://onlinecourses.swayam2.ac.in/aic23_ge09/preview- Yoga for Creativity
3. https://onlinecourses.swayam2.ac.in/aic23_ge05/preview- Yoga for concentration
4. https://onlinecourses.swayam2.ac.in/aic23_ge06/preview- yoga for memory development
5. https://onlinecourses.nptel.ac.in/noc21_hs29/preview-Psychology of Stress, Health and Well-being
6. https://onlinecourses.swayam2.ac.in/nce19_sc04/preview- Food Nutrition for Healthy Living - Course – Swayam
7. https://www.classcentral.com/course/swayam-fitness-management-17608- Fitness Management from Swayam
8. https://onlinecourses.swayam2.ac.in/nce19_sc04/preview-Food Nutrition for Healthy Living
9. https://onlinecourses.swayam2.ac.in/cec21_ed02/preview Health Education and Recreation
10. https://onlinecourses.swayam2.ac.in/cec22_ed31/preview Sports Administration and Management

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. https://www.yogajournal.com/yoga-101/philosophy/good-read
2. http://hdl.handle.net/123456789/38171- Yoga Philosophy
3. https://yoga.ayush.gov.in

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A) Course Code : **2400110 (T2400110)**

B) Course Title : Community/ Society Development

(AIML, AE, CSE, ELX (R), CHE, EE, ME, ME (Auto), MIE, FTS, CACDDM, FPP)

C) Pre- requisite Course(s) :

D) Rationale :

Community development is a process in which community members collectively generate solutions to common problems/concerns for improvement in the quality of life of the people. The course in community and society development is essential so that students can be prepared for taking up activities for the welfare and social well-being of the community and society around them. This course has been designed to develop requisite competencies and skills in students so that they can address social problems, develop sustainable solutions that are tailored to local needs and resources, engage with local communities and civil society organizations to promote people's participation in decision-making and accountability, and apply them to community development.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/ industry.

After completion of the course, the students will be able to-

CO-1 Identify the issues and problems faced by local communities/societies that can be addressed through community development schemes for sustainable development.

CO-2 Prepare an action plan for an identified issue under community development scheme for a selected area.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	2	1	1	3	2	2		
CO-2	3	2	1	1	3	3	2		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

G) Teaching & Learning Scheme:

Course Title	Scheme of Study (Hours/Week)				
	Classroom Instruction (CI)		Notional Hours (TW/ Activities+ SL)	Total Hours (CI+TW/ Activities)	Total Credits (C)
	L	**T**			
Community/ Society Development	01	-	-	01	01

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2400110	Community/ Society Development	25	-	-	-	-	-	25

Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

I) Theory Session Outcomes (TSOs) and Units: T2400110

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 1a. Explain the concept of to Community/Society in Indian Context *TSO 1b.* Explain the concept of Rural and Urban Society *TSO 1c.* Differentiate between Rural and Urban Societies. *TSO 1d.* Differentiate between Underdevelopment and development. *TSO 1e.* Describe the different components of community development	**Unit-1.0 Community and Society Development Framework** 1.1 Concept of Community/Society Development 1.2 Difference between Rural and Urban Societies 1.3 Characteristics of Underdevelopment and development 1.4 Components of Community Development	**CO1**
TSO 2a. Prepare a brief report on Community Development Programmes in India considering the given criteria	**Unit-2.0 Community Development Initiatives** 2.1 Community Development Programmes in India-Historical perspective	**CO1, CO2**

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 2b. Prepare a brief report on institutions engaged in community development programmes considering the given criteria *TSO 2c.* Explain the framework of sustainable community development	2.2 Institutions Engaged in Community Development Programmes 2.3 Contemporary Community Development Initiatives. 2.4 Sustainable Community Development	
TSO 3a. Explain Role of Technical Intuitions in Community/Society development. *TSO 3b.* Summarise the activities undertaken by technical institutions under community development through polytechnic scheme *TSO 3c.* Prepare a plan for undertaking project to support Unnat Bharat Abhiyan	**Unit-3.0 Community Development Schemes** 3.1 Role of polytechnics in Community development. 3.2 Scheme of Community Development through Polytechnics 3.3 Unnat Bharat Abhiyan	**CO3, CO4**

Note: One major TSO may require more than one Theory session/Period.

J) Suggested Term Work/ Activities and Self Learning: Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Specific assignments will be given to students for preparing report on community development programmes and institutions engaged in community development programmes.

b. Micro Projects:

1. Suggest solution for flowing water near a water source.
2. Identify locally available construction materials in a village.
3. Suggest a plan for disposal of solid waste in a village.
4. Prepare a plan for use of solar light equipments at streets and public places.

c. Other Activities:

1. Seminar Topics:
   - Issues of development for a village near to the institution.
   - Activities to be undertaken by the polytechnic in a village.
   - Characteristics of Development and underdevelopment.

2. Visits: Visit to nearby village may be arranged and students may be asked to prepare list of development activities in different Discipline.

3. Self-Learning Topics:
   - Community Development programmes in India after independence.
   - Schemes of GOI for Community /society Development.

K) Suggested Instructional/Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Field Trips, Portfolio Based, Learning, Role Play, Live Demonstrations in Classrooms, Lab, Field Information and Communications Technology (ICT)Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Session, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

L) List of Major Laboratory Equipment, Tools and Software:(Not Applicable)

M) Suggested Course Evaluation Matrix: The course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment (TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Sem Test	End Theory Assessment (ETA)	Term Work & Self Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	10%	-	-	-	-	-	-
CO-2	20%	-	-	-	-	-	-
CO-3	35%	-	-	-	-	-	-
CO-4	25%	-	-	-	-	-	-
CO-5	10%	-	-	-	-	-	-
Total Marks	**25**	**-**	**-**	**-**	**-**	**-**	**-**
			-				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentages given are approximate.
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

L) Suggested Learning Resources:

(a) Books and Reports:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Module on Rural Development: Indian Context	IGNOU, New Delhi	Published by IGNOU, New Delhi
2.	Module on Rural Development Programmes	IGNOU, New Delhi	Published by IGNOU, New Delhi
3.	Module on Rural development planning and management	IGNOU, New Delhi	Published by IGNOU, New Delhi
4.	India's Developing Villages	G R Madan	Allied Publishers, 1990
5.	Five year plans, Plan Documents, Policy and Reports	Planning Commission of India publications	Planning Commission of India
6.	Scheme of Community Development through Polytechnics	Ministry of Human Resourse Development, Shastri Bhavan ,New Delhi	Ministry of Human Resourse Development, Govt of India, New Delhi

(b) Online Educational Resources:

1. https://www.google.co.in/books/edition/Rural_Development/hABduOX-X-gC?hl=en&gbpv=1&dq=rural+development+latest+books&printsec=frontcover
2. https://www.india.gov.in/my-government/documents/plan-document
3. https://www.india.gov.in/website-planning-commission

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Project Reports Available in the office of CEO, Zila Parishad of the District.
2. Schemes of various departments of Bihar Government for Community/Social Development

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