Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

ES TT 301 Theory of Machines

Name of the Course:	THEORY OF MACHINES
Course Code: ES TT 301	**Semester: 3rd**
Duration: 6 months	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 2 hrs./week	Mid Semester Exam.: 50 Marks
Tutorial: Nil	Assignment: 40 Marks
	Quiz: 10 Marks
Practical: hr./week	Attendance: 5 Marks
Credit Points: 2	End Semester Exam.: 70 Marks

Objective:	
1	To acquire the basic knowledge about Mechanism
2	To understand the various types of belt drives and estimate the transmission of power by belt**s**
3	To be able to draw the cam profile for various followers
4	To understand the kinematics of gear trains
5	To understand the balancing of rotating masses and vibrations

Pre-Requisite:	
1	
2	
3	

End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.

Groups	Units	Objective Questions (MCQ only with one correct answer)	Subjective Questions

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A							
B							
C							

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

Unit	Content	Hrs/Unit	Marks/Unit
1	**Basic concepts:Basic concepts:**Kinematics and Kinetics; Introduction to Mechanisms; Difference between Machine, Mechanism and Structure; Classification of Pairs of Elements; Links, Frames and Kinematic Chains; Pairs, Higher Pairs, Lower Pairs, Linkages, Types of joints in a chain; Four & six -bar linkage: Motions of links, Grashof's criterion of movability; Degrees of freedom for plane Mechanisms, Gruebler's criterion for plane mechanism; Introduction to Kinematic inversions.	6	
2	**Belt, Rope and Chain Drives:**Types of belt and belt drives, Materials used for belt drives, Various types of Flat belt drives, Velocity ratio in belt drives, Slip and Creep of belt, Length of belt in flat and cross belt drives, Power transmission in belt drives, Ratio of driving tension, Adjustment of belt tensions, Angle of contact belt in belt drives, Centrifugal tension, Maximum tension in belt, Initial tension, V-belt drives, Advantages and disadvantages of V-belt drive, Toothed belt drives; Rope drives and its types, Chain drives and its advantages and disadvantages, Applications of belt, chain and rope drives.	6	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

3	**Cams:** Introduction, Cam Mechanisms, Classification of Cam Mechanisms; Types of follower; Follower Arrangement- In-line; Cam Shape - Disk cam, Groove cam, Cylindrical cam; Constraints on the Follower; Cam Nomenclature- Trace point, Pitch curve, Working curve, Pitch circle, Prime circle (reference circle, Base circle, Stroke or throw, Follower displacement, Pressure angle; Motion events- Constant Velocity Motion, Constant Acceleration Motion, Simple Harmonic Motion and Cycloidal motion; Cam Design- Parameters, Cam profile design principle, Design equations, Manual drawing examples of some textile and apparel cams especially 1-up 1-down, 2-up 1-down, 2-up 2-down etc**.	6	
4	**Gears:** Introduction, Advantages and disadvantages of gear drives, Classification of gears, Gear terminology, Laws of gearing, Types of gears – Spur, Bevel, Helical, Worm and Warp wheel; Tooth profile, Interference; Gear trains – Simple, Compound, Reverted, Epicyclic, Sun and planet gear train; Velocity calculation analysis of gear trains.	6	
5	**Balancing of Masses:** Introduction to balancing of rotating masses and reciprocating masses, Causes of unbalance, Static and dynamic balancing, Balancing of single rotating mass by a single mass rotating in same plane, Balancing of single rotating mass by two masses rotating in different plane, Balancing of several masses rotating in same plane**.	4	
6	**Vibrations:** (a) Longitudinal and Transverse Vibrations: Introduction, Terms used in vibratory motion, Types of vibratory motion, Types of free vibrations, Natural frequency of free Longitudinal vibrations, Natural frequency of free Transverse vibrations, b) Introduction to Torsional vibrations.	4	

Text and reference books:

Course Outcome: Accord knowledge about the various machine, mechanism and motion transmission in Textile and Apparel Machineries and able to draw the cams profile which are used in the field of Textile and Apparel.

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
<u>**ES TT 391 Theory of Machines Lab**</u>

Name of the Course::	**THEORY OF MACHINES LAB**
Course Code: ES TT 391	**Semester: 3rd**
Duration: 6 months	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: hrs./week	**Continuous Internal Assessment:**
Tutorial: Nil	**External Assessment: 60**
Practical: 3 hr./week	**Distribution of marks: 40**
Credit Points: 1.5	

Course Outcomes:	
1	
2	
3	
4	
5	
Pre-Requisite:	
1	
2	
3	

Practical:	
	1) **Intellectual skills-**
	2) **Motor skill-**

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

Laboratory Experiment:	
1	Introduction to various textile machinery, motion and mechanism.
2	Study and understood the friction drive mechanism and derive relevant calculation.
3	Study and understood the 4-bar link crank and crank-arm drive mechanism.
4	Study and understood the belt drive and rope drive mechanism and derives the relevant calculation.
5	Study and understood the compound spur gear drive mechanism and derive relevant calculation.
6	Study and understood the bevel gear drive mechanism and derive relevant calculation.
7	Study and understood the warm and warm-wheel mechanism and derive relevant calculation.
8	Study and understood the Ratchet and pawl drive mechanism and derive relevant calculation.
9	Study and understood the epicyclic gear drive mechanism and derive relevant calculation.
10	Study and understood the disc cam drive mechanism and derive relevant calculation.
11	Study and understood the grove cam drive mechanism and derive relevant calculation.
12	Study and understood the stepper pulley drive mechanism and derive relevant calculation.

Text and reference books:

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
BS-301 Biology for Engineers

Name of the Course:		BIOLOGY FOR ENGINEERS					
Course Code: BS - 301		**Semester: 3rd**					
Duration: 6 months		**Maximum Marks: 100**					
Teaching Scheme		**Examination Scheme**					
Theory: 3 hrs./week		Mid Semester Exam.: 50 Marks					
Tutorial: Nil		Assignment: 40 Marks					
		Quiz: 10 Marks					
Practical: hr./week		Attendance: 5 Marks					
Credit Points: 3		End Semester Exam.: 70 Marks					

Objective:	
1	To introduce modern biology with an emphasis on evolution of biology as a multidisciplinary field. 2. To make students.
2	To make students aware of application of engineering principles in biology and engineering robust solution inspired by biological examples.

Pre-Requisite: Nil

End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.

Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	**Total marks**	**No. of questions to be set**	**To answer`**	**Marks per question**	**Total marks**
A							
B							
C							

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

- Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Unit	Content	Hrs/Unit	Marks/Unit
1	Darwinian evolution, molecular perspective and classification, Phylogenetic trees, study of inter- and intra -species relationships.	3	
2	Cellular structure and function, cellular assembly and central dogma of molecular Biology	6	
3	Organismal physiology-Energy and energetic constraints	3	
4	3 D structure and function of large biological molecules.	3	
5	Techniques in bio physics and bio chemistry	3	
6	Immunology- Self vs Non-self, pathogens, human immune system, antigen-antibody reactions.	6	
7	Infectious disease Biology and vaccines.	4	
8	Cancer biology, gene regulation, aging, apoptosis and stem cell.	6	
9	Environmental bio-safety, bioresources, biodiversity.	2	
10	Drug design	2	
11	Engineering design inspired by examples in biology	2	

Text and reference books:
1. Essential of Genetics, Miko, I & LeJeune, L, Cambridge, MA, NPG Education, 2009.
2. Essential of Cell Biology, O'Connor, C.M % Adam, J,U, Cambridge, MA, NPG Education, 2010.
3. Molecular Biology of the Gene, Warson JD, Baker, TA, Bell SP, Gann A, Levin M, Losick R, Pearson Education, 2004.
4. Biology for Enginees, Tata McGraw Hill (ISBN: 978-1121-4399-31)

Course Outcome:
1. Learners will be able to define, describe and list different theories and function of different Biological structure and processes.
2. Learners will be able to explain different principles of biology
3. Learners will be able to develop the concept of vaccines and human immune system,
4. Learners will be able to correlate engineering design with examples of biology.

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
<u>PC APM 301 Textile Fibres and Yarns</u>

Name of the Course:	**TEXTILE FIBRES AND YARNS**
Course Code: PC APM 301	**Semester: III**
Duration: 6 months	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 50 Marks
Tutorial: Nil	Assignment: 40 Marks
	Quiz: 10 Marks
Practical: nil hr./week	Attendance: 5 Marks
Credit Points:3	End Semester Exam.: 70 Marks

Objective:	
1	**To learn Basic knowledge about common and speciality textile fibres used in garment**
2	**To learn basic manufacturing process for textile yarn, ply yarn and filament yarn, its parameter of yarn , sizing(count),twist characteristics ,porosity.strength of yarn**
3	**To learn manufacturing process of sewing thread , its characteristics and its numbering ,sewing threads used in garments.**

Pre-Requisite:	
1	**General physics**
2	**General chemistry**
3	**Mathematics I and Mathematics II**

End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.

Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

A	1 to 7	10	10				
B	1 to 7			6	3	5	15
C	1 to 7			6	3	15	45

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

Unit	Content	Hrs/Unit	Marks/Unit
1.Introduction to textile fibre	Definition of textile fibre, staple fibre, filaments, tow; monofilament and multifilament; fibre linear density; primary and secondary properties of textile fibres; fibre morphology; fibre classification, Staple length of cotton fibre.	**5**	**13**
2.Natural fibres	Growth and production, Microscopic properties, Physical and chemical properties, use and care, advantages and disadvantages in the field of apparel – cotton, linen, jute, silk and wool fibre; Brief understanding of retting and hackling of jute, felting of wool, reeling and degumming of silk, felting of wool.	**6**	**13**
3.Man made fibres	Brief introduction about various manmade fibre production process; Microscopic properties, Physical and chemical properties, use and care, advantages and disadvantages in the field of apparel -- viscose, acrylic, polyester; Brief introduction to Nylon 6, nylon 6.6, Kevlar, glass fibre, metallic fibres, tencel, modal, lycra, modacrylic.	**7**	**13**
4.Fibre Identification	Introduction; Test for fibre identification – burning test, solubility test, microscopic evaluation of natural and manmade fibres used in the field of apparel production.	**4**	**12**

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

5.Textile Yarns	definition; comparison with multi-filament; yarn twist, yarn diameter, porosity, twist constant, TPI, numbers of fibre in cross-section; yarn count (direct and indirect system); ply yarns; twist in ply yarn; ply yarn count; Application of staple and filament yarns in the field of apparel as per yarn fineness. Methods to determine the tensile strength of yarns.	8	18
6.Yarns manufacturing process	Objectives and principles – Blow room, carding, lap-former, comber, draw-frame, speed frame, ring frame; doubling and drafting; process flow sequence in cotton yarn, synthetic yarn, blend yarn production. Objectives and principle – rotor spinning, open-end spinning; process flow sequence in rotor and open-end; TFO; Classification of yarns; complex and complex ply yarn; texturizing and textured yarn.	6	13
7.Sewing thread	definition, Sewing thread manufacture: fibres used and essential quality particulars of sewing thread, process sequence, Manufacturing details, properties of sewing thread; ticketing number. typical commercial sewing threads used in garments.	6	18
		42hrs	100

Text and reference books:
1. Introduction to Textile Science, Marjor L. Joseph.
2. Textile Testing, by John H., Skinkle
3. Textile Testing: Physical, Chemical, and Microscopical , Skinkle, John H.
4.Textile Yarns by B.C.Goswami,J.G.Matrtindale,and F.L.Scardino.
5.Spun yarn Technology by Eric Oxtoby
6.Textile Testing by J.E.Booth

Course Outcome:
- Students learn common textile fibres , methods of identifying the fibres and also identify the unknown fibres,also learn some speciality fibres
- Students learn basics of yarn manufacturing process and sewing threads commonly used in garment production manufacturing process.
- Students learn basics parameter of sizing textile yarns (count) and common typical parameters like twist and porosity.

Special Remarks (If any): Nil

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
<u>**PC APM 391 Textile Fibres and Yarns Lab**</u>

Name of the Course:	TEXTILE FIBRES AND YARNS LAB
Course Code: PC APM 391	Semester: III
Duration: 6 months	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: hrs./week	Continuous Internal Assessment:
Tutorial: Nil	External Assessment: 60
Practical: 3 hr./week	Distribution of marks: 40
Credit Points:1.5	

Course Outcomes:	
1	Students learn textile fibres microscopical ,burning behavior,chemical behavior with standard solvents
2	Students learn features of spun and filament yarn,ply yarn,count of yarn,twist of yarn,methods to measure of count,twist,strength of yarn
3	students learn to convert the count in different system and ticketing number
4	Student learn basic processing machines to produce spun and other yarns
5	Students to learn to methods of reporting the experimental data
Pre-Requisite:	
1	Elements of statistics
2	General physics for measurement
3	General chemistry about common solvents
4	APM of Textile fibres and and Yarns

Practical: 9 number of experiments	
	1) Intellectual skills- 60 % (average)
	2) Motor skill- 40% (average)

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

Laboratory Experiment:	
1	Study of morphological features of common textile fibres (longitudinal and cross-sectional)like cotton,jute,flax,wool,silk,ramie,manmade fibres nylon,polyester,acrylic,polypropylene,viscose.
2	Study of behavior of textile fibres(natural and synthetic fibres) under common solvents, also burning in flame.
3	Study of identification of unknown fibres/blend
4	Study of feature spun and multifilament yarn, tape yarn ,ply yarn under microscope
5	Determination count of yarn and conversion of it into other system and ticketing number by wrap reel and balance method
6	Determination of twist per inch and twist direction of single yarn by twist untwist method
7	Determination of twist per inch and twist direction of ply yarn by untwisting method.
8	Determination of breaking strength and elongation of yarn
9	Elementary Study of machines for manufacturing yarn

Text and reference books:
 1.ASTM Standard testing books 2011
2. Textile testing by J.E.Booth
Special Remarks (If any): Nil

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
PC APM302- APPAREL PRODUCTION –I : Basic Pattern Making

Name of the Course:		**APPAREL PRODUCTION –I : Basic Pattern Making**				
Course Code: PC APM302		**Semester: 3rd**				
Duration: 6 months		**Maximum Marks: 100**				
Teaching Scheme		**Examination Scheme**				
Theory: 3 hrs./week		Mid Semester Exam.: 50 Marks				
Tutorial: Nil		Assignment: 40 Marks				
		Quiz: 10 Marks				
Practical: 3 hr/week		Attendance: 5 Marks				
Credit Points: 3						
Objective:						
1	To impart knowledge and geometrical conception of the relationship between human body shapes and garment patterns.					
2	To impart the technical knowledge of converting body measurements into 2D Patterns.					
3	To impart theoretical knowledge, geometry and techniques of creation of 2D patterns for different types of garments.					
4	To impart theoretical knowledge of pattern alterations for fit adjustment.					
Pre-Requisite:						
1	**Knowledge of Planar and solid geometry**					
2	**Knowledge of shapes, curves, basic human anatomy.**					
3	**Elementary drawing skills .**					
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.						
Groups	**Units**	**Objective Questions (MCQ only with one correct answer)**		**Subjective Questions**			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A		**10**	**10**				

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

B					5	3	5	15
C					5	3	15	45

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

PC APM 302   APPAREL PRODUCTION I

Unit	Content	Hrs/Unit	Marks/Unit
1	Anatomy: proportion and disproportion of humane figure. Figure types and variations- normal figures measurements and its importance-Standard body measurements for children, ladies and gents. Sequence of taking body measurements for different age groups and gender-recording of measurements, Preparation of Measurement Chart. Standard Measurement Charts.	4	5
2	Basic Patternmaking terminologies i.e. Pattern drafting, Flat Pattern Making, Pattern making by draping method, Basic Bodice, Working Pattern, Production Pattern , Seam Allowance , Dart , Notch etc. Basic Fabric terminologies useful for pattern drafting i.e. Grain , Lengthwise grain , crosswise grain , Selvedge, Bias , True bias , Bowing & Skewing etc. Introduction to Pattern Making Tools - Measuring tools, marking tools, Cutting tools, Pressing tools, different GSM paper etc.	4	5
3	Figure types & figure analysis (leg types, arm types, shoulders, abdomen, bust back relationship, waist hip relationship and stance, concept of torso etc). Body & garment relationship, Standardization, introduction to fit ratio – body fit , slim fit , loose fit etc	4	5
4	Drafting basic pattern for bodice, sleeve, collar, yoke, and skirt. Style reading: Preparation of dress form and draping fabric for various garments- Advantages of draping style reading of basic bodice. Flat pattern techniques: Fitting and pattern alteration: fitting-definition-principles of a good fit. Standards for a good fit, e-fitting, 3D body scanner, 3D simulators Causes for poor fit, checking the fit of a garment, solving fitting problems in various garments.	8	20
5	Pattern Alterations: Importance of altering patterns .principles of pattern alterations. Alteration of pattern for irregular figures. Pattern alteration techniques- pivot, slash & spread method-length- width- front-back-sleeve shirt-Skirt-trousers.	6	15
6	Fullness: definition, methods of introducing fullness in garments-gathers, pleats, flares, flounces, smocking , tucks & darts, methods of controlling fullness. Dart Manipulation- conversion of darts to tucks, pleats, gathers, seemliness etc. Different types of Darts.	4	5

14

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

7	Different types of Sleeve Patterns , Sleeves- Definition, terms, classification, types-basic sleeve, gathered, bell, kimono, raglan, etc.	4	5
8	Different types of patterns for Collars - Definition, terms, classification, and types –Peter pan, sailor, Turtle collar, shawl, formal shirt collar, Mandarin, collar with stand & its variations & onstruction. Different types of patterns for Yokes-Definitions, purpose, types-with fullness & without fullness, Shapes & construction. Different types of patterns for Pockets- Definitions, purpose, Patch pockets, Patch pockets with flap, Seam pockets, welt pockets & variations . Different types of patterns for Neck line Finishes- piping, facing (bias facing, shaped facing). Different types of patterns for Plackets- definition, types Self, front placket, continues bound placket, two piece sleeve placket and shirt placket. Different types of patterns for Skirts – Basic-flared, circular, gathered, pleated, basic waist band application.	6	5
9	Silhouettes and Pattern drafting for different Dress categories: with waistline without waist line, Shirts , Jackets , Coats , Capes and Hoods , Trousers , Action-wear , Swimwear , Intimate wear , Children wear , Jumpers , Bodysuits , Jumpsuits etc.	5	5

Text and reference books:
1. Bane Allyne, "Flat pattern design", McGrawHill publications, USA
2. Gerry Cooklin, "Introduction to Clothing Manufacture", Blackwell Science, UK, 1991
3. Harold Carr & Barbara Latham, "The Technology of Clothing Manufacture", Oxford Pub., USA, 1994
4. Helen J Armstrong, "Pattern Making for Fashion Design", Prentice Hall

5. Winfred Aldrich.. "Metric Pattern Cutting".. Blackwell Science, UK press, 1980
6. Mary Mathews 'Practical clothing construction' Thomson & Co. Madras,1974
7. Cock V. 'Dress making simplified' Black well science,1987

Course Outcome:

1) Students will gather the knowledge and geometrical conception of the relationship between human body shapes and garment patterns.
2) Students will gather expertise in taking body measurements and conversion of body measurements into the measurement chart for pattern making depending upon different fit ratios and silhouette.
3) Students will acquire theoretical knowledge, geometry and techniques of creation of 2D patterns for different types of garments.
4) Students will acquire theoretical knowledge of pattern alterations for fit adjustment.

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
PC APM392 APPAREL PRODUCTION- Lab I : Basic Pattern Making

Name of the Course:	APPAREL PRODUCTION- Lab I : Basic Pattern Making
Course Code: PC APM 392	Semester: 3rd
Duration: 6 months	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: hrs./week	Continuous Internal Assessment:
Tutorial: Nil	External Assessment: 60
Practical: 3 hr./week	Distribution of marks: 40
Credit Points: 1.5	

Course Outcomes:	
1	Students will gather practical knowledge and expertise in taking body measurements and conversion of body measurements into the measurement chart for pattern making depending upon different fit ratios and silhouette.
2	Students will gather practical knowledge and expertise in analysing readymade full garment in respect of measurements of different parts and preparation of 2D patterns for reproducing the garment.
3	Students will acquire theoretical knowledge, geometry and techniques of creation of 2D patterns for different types of special garments.
4	Students will acquire theoretical knowledge of pattern alterations for fit adjustment.

Pre-Requisite:	
1	**Knowledge of Planar and Solid geometry.**
2	**Knowledge about aesthetic, shape and form.**
3	**Basic drawing skill .**

Practical:	
	1) **Intellectual skills- Aesthetic sense of form , shape and symmetry.**
	2) **Motor skill- Elementary drawing skill.**

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

PC APM 392 APPAREL PRODUCTION Lab I

Laboratory Experiment:	
1	Take sequential measurements of different human figures / mannequins and prepare Measurement Charts. Add Seam Allowance. Take full readymade garments and prepare standard measurement charts. Add Seam Allowance.
2	Prepare basic patterns for Bodice, Sleeve and: Use both Draping method and Flat Pattern Drafting method. Using the measurement charts prepared. Preparation of muslin basic blocks. Do alterations for fit adjustment.
3	Prepare basic patterns for Collar, Placket, Pocket, Yoke etc: Use both Draping method and flat pattern drafting method. Using the measurement charts prepared . Preparation of muslin basic blocks . Do alterations for fit adjustment.
4	Prepare basic patterns for Trousers : Using the measurement charts prepared . Use both Draping method and Flat Pattern Drafting method. Preparation of muslin basic blocks. Do alterations for fit adjustment.
5	Prepare basic patterns for Skirts : Using the measurement charts prepared . Use both Draping method and Flat Pattern Drafting method. Preparation of muslin basic blocks. Do alterations for fit adjustment.
6	Prepare basic patterns for Intimate wear/sportswear : Using the measurement charts prepared . Use both Draping method and Flat Pattern Drafting method. Preparation of muslin basic blocks. Do alterations for fit adjustment.
7	Practical jobs on the application of darts, gathers, pleat etc. on patterns. Use muslin fabrics.
8	Prepare paper patterns/muslin patterns for special Sleeves- plain, gathered, raglan, kimono etc .
9	Prepare paper patterns/muslin patterns for special Collars- peter pan, turtle neck, Chinese, etc .
10	Prepare paper patterns/muslin patterns for special Yokes-With and without fullness style lines .
11	Prepare paper patterns/muslin patterns for special Pockets-Patch pockets, Patch pockets with flap, Seam pockets etc
12	Analyse and Prepare paper patterns/muslin patterns for different parts of a standard readymade shirt/ trouser/suit .

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

Text and reference books:

1. Bane Allyne, "Flat pattern design", McGrawHill publications, USA
2. Helen J Armstrong, "Pattern Making for Fashion Design", Prentice Hall

3. Winfred Aldrich.. "Metric Pattern Cutting".. Blackwell Science, UK press, 1980
4. Mary Mathews 'Practical clothing construction' Thomson & Co. Madras,1974
5. Cock V. 'Dress making simplified' Black well science,1987

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
<u>**PC APM 303 Elements of Fashion and Costume Design**</u>

Name of the Course:	**ELEMENTS OF FASHION AND COSTUME DESIGN**
Course Code: PC APM 303	**Semester: 3rd**
Duration: 6 months	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 50 Marks
Tutorial: Nil	Assignment: 40 Marks
	Quiz: 10 Marks
Practical: hrs/week	Attendance: 5 Marks
Credit Points: 3	End Semester Exam.: 70 Marks

Objective:	
1	To make the Students acquainted with the significance of Fashion & Apparel Industry in India.
2	To Impart knowledge about different stages of Fashion Life-cycle, Theory of Fashion Propagation etc and factors of fashion design.
3	To make students aware about different methods of Fashion promotion.
4	To Impart an overview about traditional and modern costumes around the globe.

Pre-Requisite:	
1	**A good conception about shape and colour.**
2	**Good Aesthetic sense and analytical aptitude.**
3	**Good command over English.**

End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.

Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A		**10**	**10**				
B				5	3	5	15

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

C					5	3	15	45

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

PC APM 303   Elements of Fashion and Costume Design

Unit	Content	Hrs/Unit	Marks/Unit
1	Overview of The Fashion and Apparel industry in India. Domestic Industry: Size &, nature of industry. Export industry: size & nature of this industry. Sourcing and production centres. SWOT Analysis of Present Indian Apparel Industry. Promotional Organisation : AEPC, GEA, AHEA, CMAI etc. Their role in the promotion of garments exports.	4	5
2	Elements of Fashion process: Fashion origin, evolution- with examples from different eras, Fashion cycles- different phases of fashion cycle, classic, fad, recurring cycle, Fashion theories and terminologies. Fashion propagation.	6	10
3	Elements of Fashion Design (point, line, form, shape, space, size, texture and colour), Principles of Design – (harmony, proportion, balance, rhythm and emphasis) , Colour aspects of costumes : colour theory-primary-secondary-tertiary colour- Intermediate colour-colour scheme- colour dimension-Warm & cool colour-colour harmony, Colour Theory : colour system, Pantone Colours, colour wheel, colour value scale, grey scale, colour psychology, colour and emotions, Indian approach to colour. Figure/ Design relationship, with examples of different types of human figures. Selection of fabrics, textiles, pattern & colour for aesthetic requirements of dress elements of different types of apparels.	11	25
4	Representation of Fashion Ideas through visual art: -Mood board-Formation of mood board, fabric board, colour board, client board etc. Introduction to Fashion illustration. Introduction to Proportion and the Fashion Figure- 8 head, 10 head, 12 head theory of fashion drawing.	8	10
5	Fashion Promotions through Fashion shows , Window display etc –survey on modern dress, study of current fashion trends, fashion forecasting-colour, fabrics, current fashion silhouettes, texture, design-seasons.	8	10
6	Costumes: Origin of costume - origin of clothing, factors influencing costume changes. Costume of India: Traditional costumes of different states of India. Costumes of Nepal, Bhutan etc. Costume of Pakistan, Sri-Lanka, China, Myanmar, Thailand etc. Costume of Egypt, Greece, Rome etc. African Costumes, French Costumes, British Costume, American costumes etc.	8	10

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

Text and reference books:
1. Anderson B. and Anderson C "costume design", Harcourt Brace 2nd Ed.,1999
2. Laver J., costume and Fashion" Thames & Hudson 1995
3. Bride M Whelan, "Colour Harmony'" Rockfort Publishers, 1992
4. Chijiwa, Hideaki, "Colour Harmony", Rockfort publishers, USA, 10111 edition-I, 1992
5. Katherine Morris Cester,"Historic Costumes", Prentice Hall 2000.
6. Fringe G.S."Fashion from concept to Consumer", Prentice Hall1998
7. Jamila Brij bhu Shan, "The constume & Textiles India ",Prentice Hall 2000.
8. Fillow J and Bernard n. Thomas and Hudson,"Traditional Indian textiles ",1993
9. Stede v. Berg "Paris fashion:a cultural history"2nd edition 1998

Course Outcome:
1) Students will be acquainted with present volume and potential of Apparel Industry in India.
2) Students will acquire knowledge about different stages of Fashion Life-cycle, Theory of Fashion Propagation etc.
3)Students will gather Knowledge about different elements of Fashion Design , selection of materials for Fashion , and Fashion Illustration for representation of Fashion Ideas through visual art.
4) Students will be familiar with different methods of Fashion promotion and advertisement, along with Fashion Forecasting techniques.
5) Students will gather an overall conception about traditional and modern costumes of different parts of India and the globe, as a source of fashion inspiration.

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

PC APM 393   Elements of Fashion and Costume Design Lab

Name of the Course: LAB ON ELEMENTS OF FASHION & COSTUME DESIGN	
Course Code: PC APM393	**Semester: 3ʳᵈ**
Duration: 6 months	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	**Continuous Internal Assessment:**
Tutorial: Nil	**External Assessment: 60**
Practical: 2 hrs/week	**Distribution of marks: 40**
Credit Points: 1	

Course Outcomes:	
1	Students will be acquainted with the fashion illustration and Fashion rendering techniques, so that they can represent their design ideas in presentable and effective way.
2	Students will be familiar to the different phases of converting concept into professional presentation.
3	Students will acquire practical knowledge of Colour combinations, Color schema for Fashion products.
4	Students will nurture and explore their creative ideas.

Pre-Requisite:	
1	**Elementary drawing and creative skills**
2	**Basic Ideas about aesthetics, shapes, geometry and colours.**
3	**Good command over English and visual presentation skill.**

Practical:	
	1) **Intellectual skills- Creative ideas , Good Imagination power , Colour psychology**
	2) **Motor skill- Line, Shape, Curve drawing skills.**

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

Laboratory Experiment:	
1	Study of types and techniques of Fashion Illustration: Introduction to art media and its applications, Line Sketching and Painting techniques with the demonstrations of the effects of Elements of design i.e. Point, Line, Shape, Space, Colour and texture.
2	Object Drawing, Simple rendering of art materials using pencil and colour pencils, Drawing of Still image of simple objects and drawing of fabrics draped at a distance.
3	Demonstrations and jobs on creation of colour schemes - primary, secondary, tertiary, colour scheme - monochromatic, achromatic, complementary, double split ,analogues, cool & warm colour using natural/geometric/ abstract/ stylized/conventional motifs, Tints, Shades.
4	Study of basic anatomy. Constant proportions – Children-Men and Women in Various poses. Drawing face and hairstyles. Drawing arms and legs with accessories. Creating various poses.
5	Design details – Silhouette of garments and its types. Drawing of various types of silhouettes.
6	Drawing different types of necklines, collars, sleeves and cuffs. Drawing of different types of full garments with application of different colour combinations, silhouettes. etc.
7	Costume drawing -Sketching the fall of the fabric-Accessories drawing. Sketching different types of garments and costumes.
8	Fashion figure Illustration basics, simple blocking and fleshing of the Fashion figure. 8 head, 10 head, 12 head figures in simple standing poses.
9	Fabric rendering: Learning to simulate textures of various fabrics- Cotton, silk, fur, denim, print, georgette, chiffon, knitted, crochet, lace, embroidered.
10	Creation of Fashion Mood Board based upon different themes.
11	Creation of Fabric Board & Colour Board based upon specific themes and Colour schemes.
12	Collection of Costume designs through free-hand sketch based upon certain themes/tradition/festival/season etc.

Text and reference books:
1. Stanyer, Peter, ―The Complete Book of Drawing Techniques‖ – Arcturus Publishing Limited for Book Mart Limited 2003.
2. Stockton and James, " Designers Guide to Colour", Chronicle Books, San Francisco, 1984
3. Gold Stein and Gold Stein, "Art in everyday life", Calcutta- IBH Publishing Co., 1972
4. Piper, David, ―"The Joy of Art", – Mitchell Beazley Publishers, 1984.
5. Anderson B. and Anderson C "costume design", Harcourt Brace 2nd Ed.,1999
6. Fringe G.S. "Fashion from concept to Consumer", Prentice Hall1998

Special Remarks (If any):

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)
<u>**HM 301 Economics for Engineers**</u>

Name of the Course: ECONOMICS FOR ENGINEERS	
Course Code: HM- 301	**Semester: 3rd**
Duration: 6 months	**Examination Scheme**
Teaching Scheme	Mid Semester Exam.: 50 Marks
Theory: 3 hrs./week	Assignment: 40 Marks
Tutorial: Nil	Quiz: 10 Marks
	Attendance: 5 Marks
Practical: hr./week	End Semester Exam.: 70 Marks
Credit Points: 3	**Examination Scheme**

Objective:	
1	
2	
3	

Pre-Requisite: No-prerequisite	
1	
2	
3	

End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.

Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

A						
B						
C						

- Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Unit	Content	Hrs/Unit	Marks/Unit
1	Economic Decisions Making – 1. Overview, Problems, Role, Decision making process. 2. Engineering Costs & Estimation – Fixed, Variable, Marginal & Average Costs, Sunk Costs, Opportunity Costs, Recurring And Nonrecurring Costs, Incremental Costs, Cash Costs vs Book Costs, Life-Cycle Costs; Types Of Estimate, Estimating Models - PerUnit Model, Segmenting Model, Cost Indexes, Power-Sizing Model, Improvement & Learning Curve, Benefits.	9	
2	3. Cash Flow, Interest and Equivalence: Cash Flow – Diagrams, Categories & Computation, Time Value of Money, Debt repayment,Nominal & Effective Interest. 4. Cash Flow & Rate Of Return Analysis – Calculations, Treatment of Salvage Value, Annual Cash Flow Analysis, Analysis Periods; Internal Rate Of Return, Calculating Rate of Return, Incremental Analysis; Best Alternative Choosing An Analysis Method, Future Worth Analysis, Benefit-Cost Ratio Analysis, Sensitivity And Breakeven Analysis. Economic Analysis In The Public Sector -Quantifying And Valuing Benefits & drawbacks.	9	
3	5. Inflation And Price Change – Definition, Effects, Causes, Price Change with Indexes, Types of Index, Composite vs Commodity Indexes, Use of Price Indexes In Engineering Economic Analysis, Cash Flows that inflate at different Rates. 6. Present Worth Analysis: End-Of-Year Convention, Viewpoint Of Economic Analysis Studies, Borrowed Money Viewpoint, Effect Of Inflation & Deflation, Taxes, Economic Criteria, Applying Present Worth Techniques, Multiple Alternatives. 7. Uncertainty In Future Events - Estimates and Their Use in Economic Analysis, Range Of Estimates, Probability, Joint Probability Distributions, Expected Value, Economic Decision Trees, Risk, Risk vs Return,	9	

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Apparel Production Management (APM)
(Applicable from the academic session 2018-2019)

4	8. Depreciation - Basic Aspects, Deterioration & Obsolescence, Depreciation And Expenses, Types Of Property, DepreciationCalculation Fundamentals, Depreciation And Capital Allowance Methods, Straight-Line Depreciation Declining BalanceDepreciation, Common Elements Of Tax Regulations For Depreciation And Capital Allowances.		
	9. Replacement Analysis - Replacement Analysis Decision Map, Minimum Cost Life of a New Asset, Marginal Cost, Minimum CostLife Problems.	9	
	10. Accounting – Function, Balance Sheet, Income Statement, Financial Ratios Capital Transactions, Cost Accounting, Direct andIndirect Costs, Indirect Cost Allocation.		

Text books /References

1. James L.Riggs,David D. Bedworth, Sabah U. Randhawa : Economics for Engineers 4e , Tata McGraw-Hill
2. Donald Newnan, Ted Eschembach, Jerome Lavelle : Engineering Economics Analysis, OUP
3. John A. White, Kenneth E.Case,DavidB.Pratt : Principle of Engineering Economic Analysis, John Wiley
4. Sullivan and Wicks: Engineering Economy, Pearson
5. R.PaneerSeelvan: Engineering Economics, PHI
6. Michael R Lindeburg : Engineering Economics Analysis, Professional Pub
7. Dr. Premvir Kapoor, Sociology & Economics for Engineers, Khanna Publishing House, New Delhi