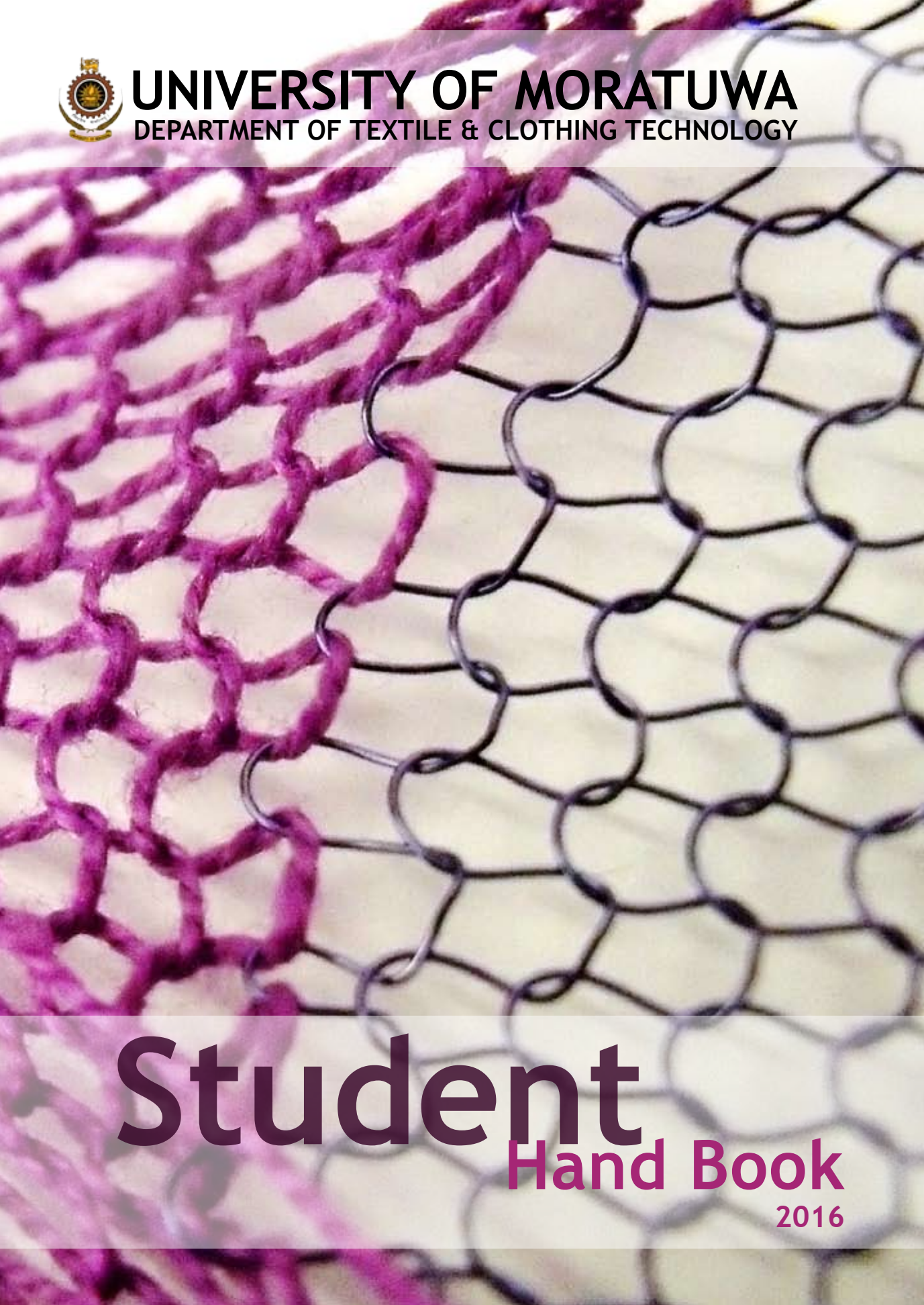

UNIVERSITY OF MORATUWA

DEPARTMENT OF TEXTILE & CLOTHING TECHNOLOGY

Student Hand Book

2016

DEPARTMENT OF
TEXTILE & CLOTHING TECHNOLOGY

University of Moratuwa

HANDBOOK 2016

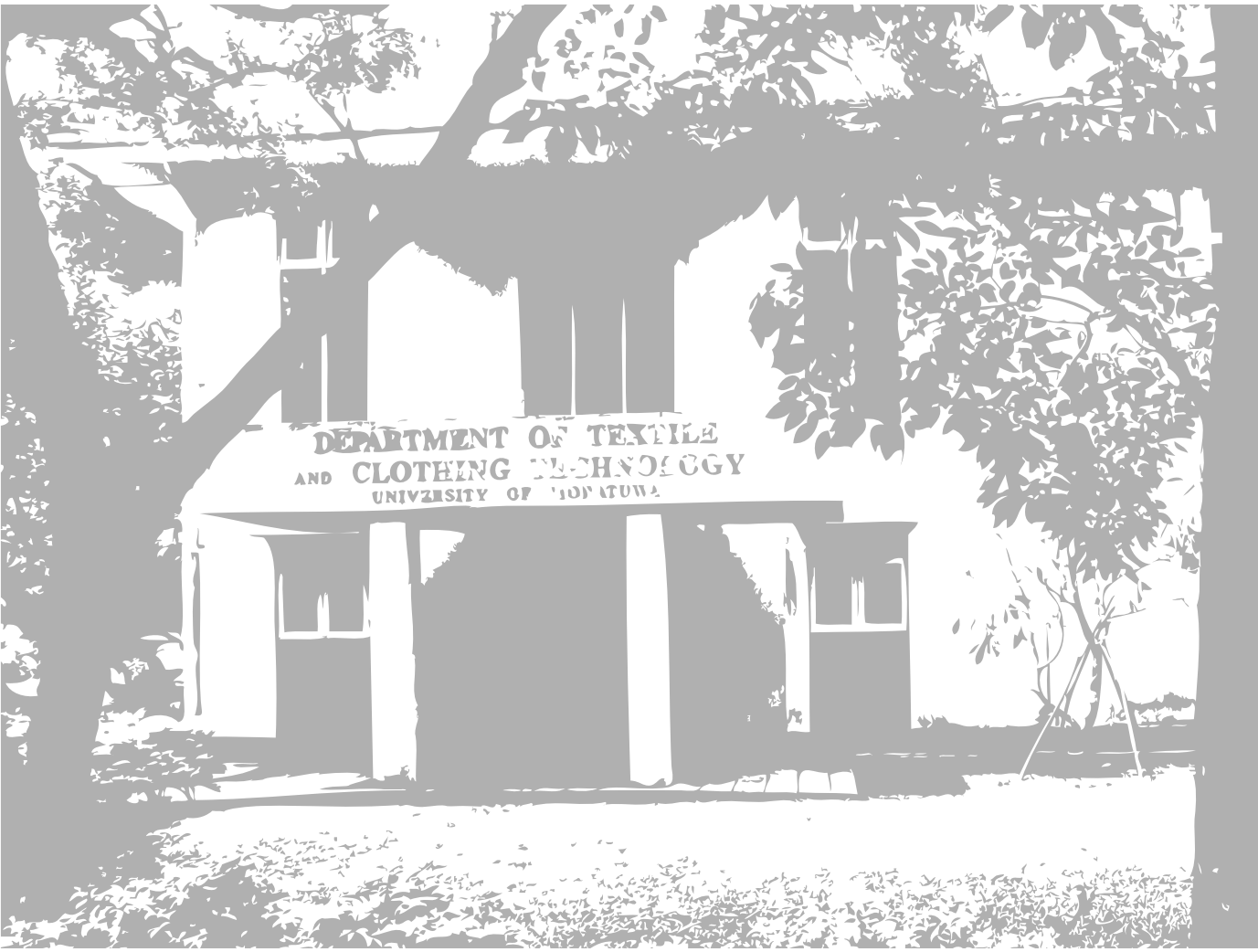
DEPARTMENT OF TEXTILE
AND CLOTHING TECHNOLOGY

Table of Contents

Message from the Head of Department

The Department of Textile & Clothing Technology was established as a fully fledged Department in 1985 under the guidance of the founder Head of Department, Emeritus Professor Lakdas D Fernando. The Department currently offers two undergraduate degree programmes namely BSc Eng (Hons) and BDes (FD&PD). The BSc Engineering programme was established in 1986 with the consultancy assistance from the University of Leeds and the Manchester Metropolitan University of UK and this degree programme is accredited by the Textile Institute UK. The BDes (Fashion Design and Product Development) degree programme was established in 2001 with the consultancy assistance from London College of Fashion of the University of Arts in London. Both the degree programmes are well recognized locally as well as internationally and provide local and foreign employment and postgraduate opportunities. The Department also offers part time MSc programme in Textile and Clothing Management and research degrees leading to MPhil and PhD qualifications.

Education in textile is not only confined to apparel and home textiles such as drapery, but the applications of textiles extend to many areas such as medical, geo-technical, composite structures, civil and mechanical engineering, smart textiles and many more fields. Fashion is an essential part of the apparel business. It influences the human thinking and behavior.

Textile and Apparel Industry – The Department of Textile & Clothing Technology is proud of being the main human resources provider to the largest manufacturing industry in Sri Lanka, bringing over 40% of the foreign exchange of the country. Being an industry catering to the world apparel market, the knowledge and the competencies expected from potential graduates are ever changing. We, as academics of the Department are well aware of the competencies expected by the industry through the strong links the Department has forged with the industry. Year on year, the graduates of the Department have maintained a near 100% employability reflecting the standards we maintain.

Co-curricular and extracurricular activities -Our focus is not only imparting knowledge but also the personality development of students. We take extra efforts in developing skills and attitudes of students so that the final product is well formed. Speech craft programme, mentoring programme, mock interview sessions, attitude building programmes, assessment centre guest lectures etc. are annually offered programmes for students. Most of these are funded by the industry and the Alumni.

Graduate Fashion Show is a gala event of the year to stage the final outcome of the students of the BDes (FD & PD) programme. Several awards are announced at the Fashion Show for creative work of the Design students.

Alumni - We are proud of a very strong Alumni of the Department; 'Moratuwa University Textile Association' (MUTA). MUTA is financially sound with the strong membership over 200 life-members. The annual events organized by MUTA such as AGM and 'MUTA Reunion' are opened to students providing opportunities to meet the top tanking Alumni in the industry. MUTA provides scholarships to financially needy students on case by case basis and is ever willing to help the undergraduates of the Department.

University education should not be limited to knowledge. The students are expected to enjoy the university life though many opportunities that also help their personality development. University provides facilities in sports and has many societies for students to engage in. The Department too provides such facilities in small scale; 'SithManjari' provides the students with the opportunity to learn playing music instruments. 'Tex Padura', annual trip and 'Texa Day' are few annual events organized by the Textile Engineering Student Society' (TESS).

As one of the most progressive Departments in the University committed to excellence in education and all other activities, we welcome you to our fold.

Dr.USW Gunasekara

Our Vision

The vision of the Department of Textile and Clothing Technology is to become a Centre of Excellence in the areas of Textiles, Clothing, Fashion Design and related disciplines through education and knowledge creation.

Our Mission

The mission of the Department of Textile and Clothing Technology is to provide world-class undergraduate teaching, postgraduate research and training for the industry and consultancy for the benefit of national and international communities. We strive to maintain high standards in all aspects of our work and seek continual improvement of quality in teaching, learning, research and consultancy.

- To enhance current undergraduate programs at the university by continuously updating the curriculum, and to provide a solid basis for all textile related education demanded by the industry.
- To produce new, cross-disciplinary undergraduate and postgraduate programmes through the interaction of other departments.
- To provide state of the art equipment and infrastructure to students,academics and the industry in a world class facility.
- To enhance Information Technology skills in all students
- To build in effective communication skill development in undergraduate programmes.
- To continually improve the academic environment of the Department to become a key facilitator towards social harmony in all its activities.

History of the Department

The University of Moratuwa, situated 18km south of Colombo is the Centre of Excellence for engineering, technological and architectural studies in Sri Lanka. The Department of Textile and Clothing Technology of the University is one of the Departments in the Faculty of Engineering and is the first of its kind in the Sri Lankan University system.

The Department had its humble beginning in 1976 as a sub-department of the Department of Mechanical Engineering. At that time the course conducted was the National Diploma in Technology course in Textile Technology. Seeing the need for graduates in the industry the Department later began a postgraduate diploma to serve as a conversion course for those graduates from other disciplines employed in the industry.

The Department of Textile & Clothing Technology came into being as a fully fledged Department in 1985, with the launch of the BSc Engineering Degree Program with the assistance of the Textile Department of the University of Leeds and the Manchester Metropolitan University. In 2001 the Bachelor of Design course came into being, with collaboration from the London College of Fashion of the University of Arts London, a specialist in fashion design education.

The Department of Textile & Clothing Technology has many "firsts" to its credit:

- first ever BSc Engineering degree in Textile & Clothing Technology in Sri Lanka.
- first ever degree in Fashion Design in the Sri Lankan University system introduced in 2001.
- first ever testing house providing testing and quality control services and consultancy to the industry.
- first department in the Faculty of Engineering to take in students directly to the Department on entry to the University.

In a comparatively short period of time the Department of Textile & Clothing Technology has become a trailblazer and the foremost provider of textile education in Sri Lanka.

In addition to academic activities the Department prides itself in its efforts to make an impact on society. The Department has undertaken a number of community service projects, among them being a project at Sonuththara, Hasalaka, where the staff, both academic and non-academic, students and graduates made visits to provide support in terms of educational material, footwear, sports equipment, computer facilities and academic and sports training to students and staff of the Sonuththara Maha Vidyalaya. In addition the Department has organised several medical camps for the village community, providing them with free medicines and dental care. We have had the privilege of learning that the pass rate at the GCE Ordinary Level examination from the school has since increased dramatically. Students of the B. Design program also carried out shramadana projects at the School for the Blind in Ratmalana. And also the students of the BSc Engineering programme have organized a moment of relaxation, a friendly chat and live music session followed by refreshments for the elderly people at Salina Alwis elders' home Suwarapola, Piliyandala.

Why study Textile Engineering?

Textiles touch today's world in every sphere. The most obvious use of textiles is the clothes we wear, but in addition textiles are found in drapery, upholstery and other furnishings. Going even further, textiles are used extensively in automobiles, aircraft, spacecraft, ships and boats. Medical textiles include a whole range of uses, such as hernia meshes, artificial knee caps and other prosthetic devices, heart valves etc. Textiles are used in the construction industry, as geo-textiles to prevent soil erosion and in diverse other ways.

The Sri Lankan garment industry is the largest export industry in Sri Lanka, with a major portion of the nation's export revenue coming through this industry. The curriculum of the textile engineering course has been tailored to gear the student to face the challenges of this industry with confidence and contribute towards moving our industry on the hi-tech, upmarket route. The industry caters to a worldwide market, and the resulting challenges due to the changes in the global scene, together with the need to integrate information technology, communication and management skills, make textile engineering one of the most challenging disciplines available.

Career Opportunities

Being the largest foreign exchange earning industry in the country, the garment industry of Sri Lanka employs over 350,000 personnel. To date the Department has produced more than 900 graduates, most of whom are gainfully employed in the industry, and making no small contribution to the growth of the industry. There are ample career opportunities for graduates of the Department in the Apparel industry and its related feeder industries. Career opportunities are also available in other textile based industries in the country, and overseas, as well as in quality audit firms and in academia. Graduates holding B.Sc. Engineering in textile & clothing are able to step into any postgraduate degree program in reputed universities worldwide with many of our graduates having obtained postgraduate degrees not only in textile and apparel engineering & management but also in many other areas such as civil engineering, mechanical engineering, computer science.

Why study Fashion Design?

Fashion is the style of dressing that prevails among a group of persons which may last for a limited period of time. Fashion clothing has become a means of expressing individuals and creating identities. Fashion leads the apparel business by its very nature of changing constantly.

The Fashion Design & Product Development degree aims to develop young professionals having a creative flair for new and innovative styles of dressing. This is focussed on trend, lifestyle, market, and accounts for a large proportion of the value addition.

Career Opportunities

The apparel industry of Sri Lanka is promoting a total service package to the overseas markets/retailers from design through development and manufacturing to distribution. In this endeavour, each of the supplier factories would need to employ a team of Designers that understand the needs of the Fashion buyer and consumer. Graduates in Fashion Design & Product Development would find employment as Fashion Buyers, Designers, Fashion Stylist, Fashion Journalist, Product Developers, Merchandisers, Retailers and Entrepreneurs. Some of our graduates have found employment with very prestigious overseas companies and Designer labels in the Fashion Business.

The graduates from this course would qualify for postgraduate studies in any reputed institution in the world engaged in Art & Design.

Department Organisation & Administration

Department Organisation

In the University system the principal officer is the Vice Chancellor. The University of Moratuwa has 3 faculties, namely Engineering, Architecture and Information Technology. Each Faculty has its own Dean, who is responsible for the administrative and academic activities of the Faculty. The Department of Textile & Clothing Technology is part of the Faculty of Engineering and functions under the Head of Department, to whom all other members of the academic and non-academic staff of the Department report. The different courses in the Department function under their respective coordinators/directors.

The Department office is manned by a clerk, a computer application assistant, and assistants, and functions under the direct supervision of the Head of Department. The various laboratories have their individual lecturers in charge, technical officers and laboratory attendants as described under the section on Equipment and Facilities.

Location of the Department

The Department of Textile & Clothing Technology is located as the last building on the road straight down from the University main gate in front of the Department of Civil Engineering.

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Head of Department
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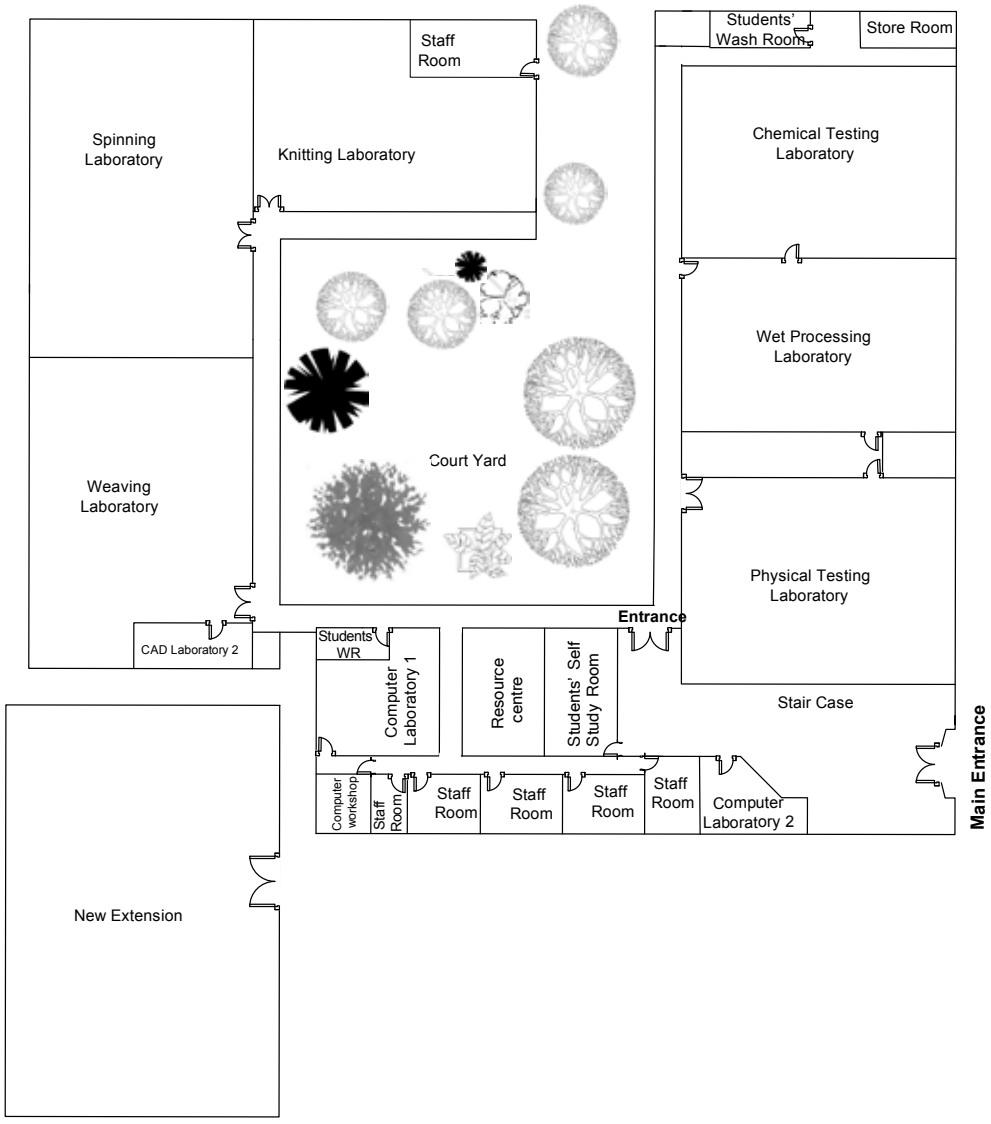
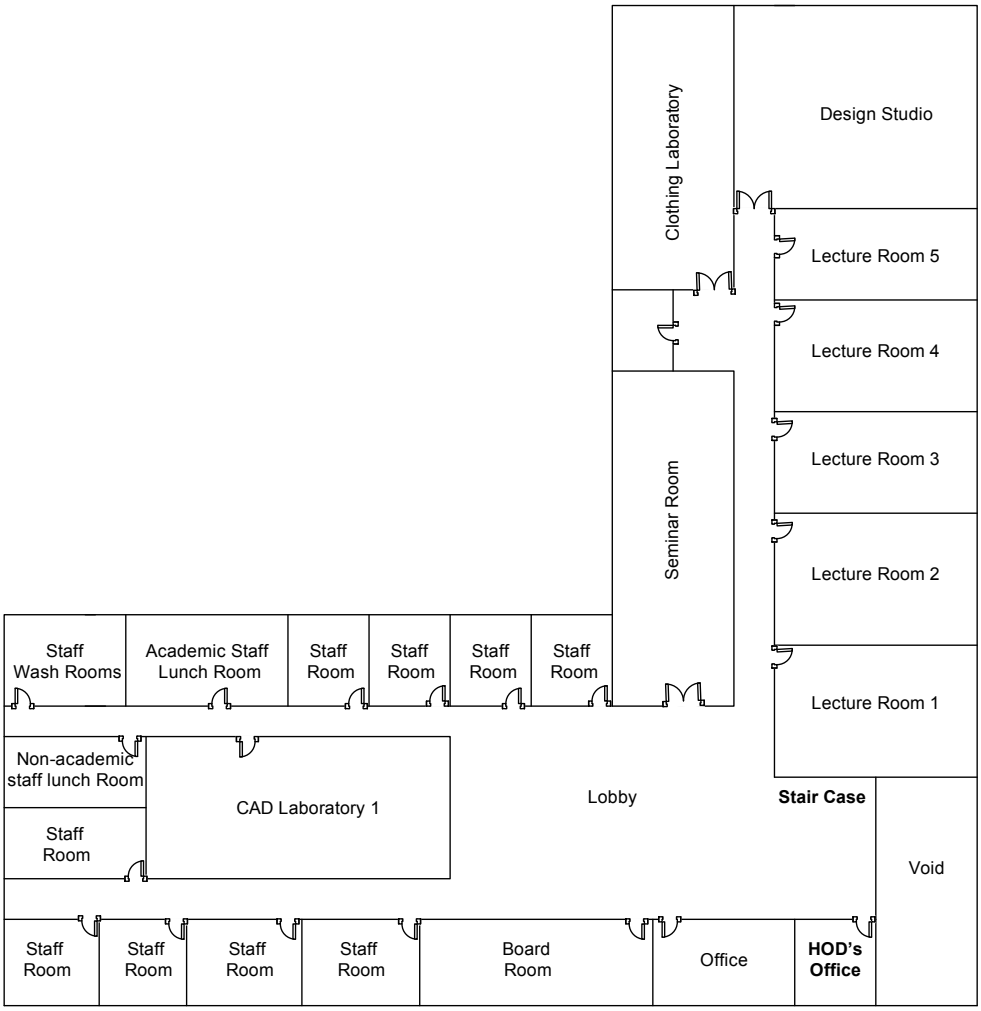


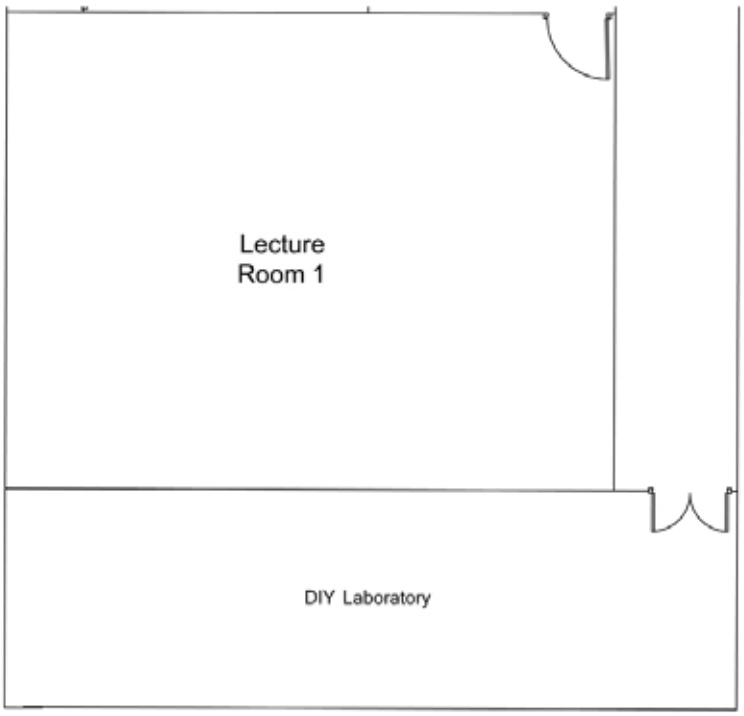
Ground Floor- Main Building of the Department of Textile & Clothing Technology

(Floor plan- not drawn to scale)

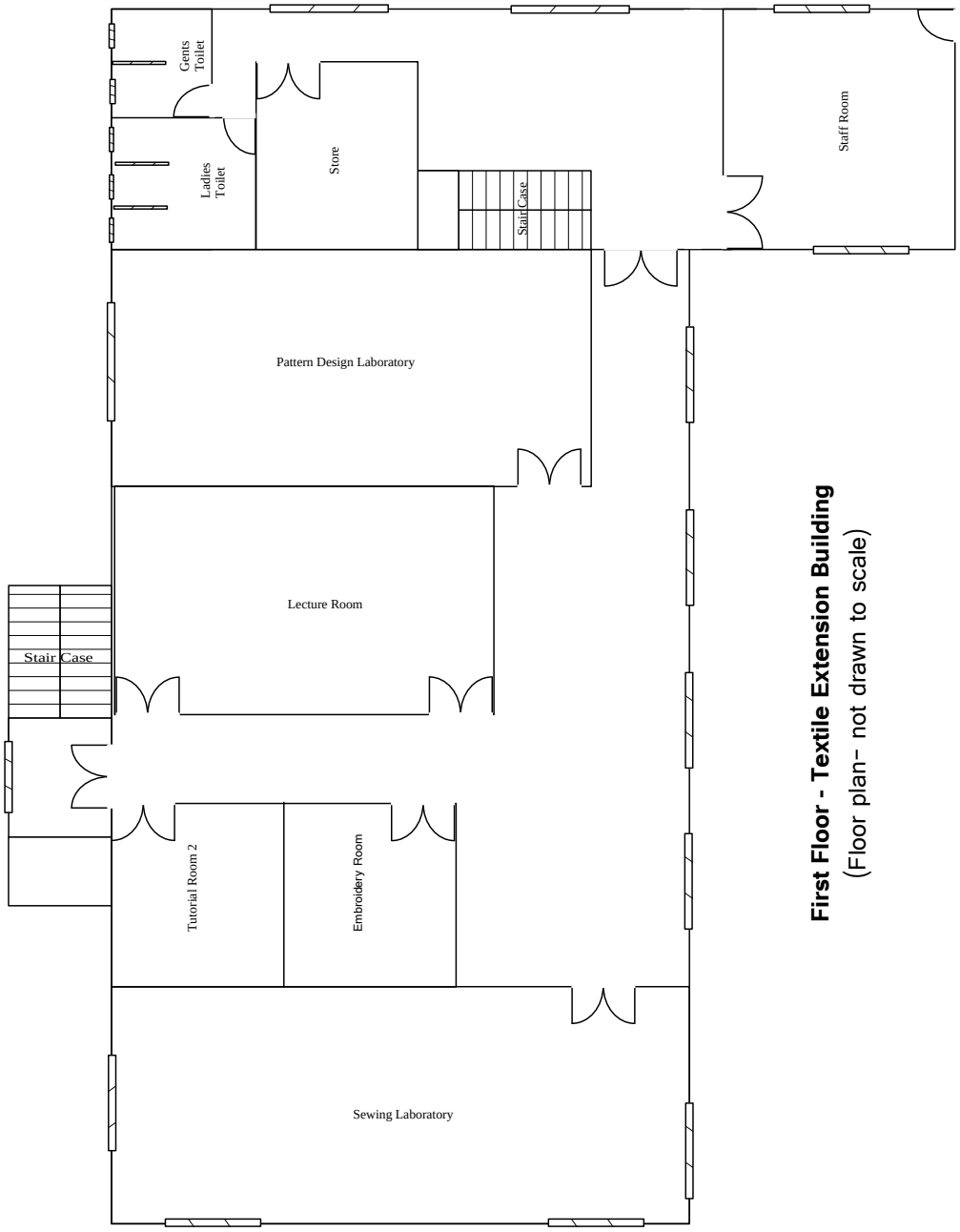


First Floor- Main Building of the Department of Textile & Clothing Technology

(Floor plan- not drawn to scale)



Floor Plan - Textile Old Building
(Floor plan– not drawn to scale)



First Floor - Textile Extension Building
(Floor plan- not drawn to scale)

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Head of Department

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Mrs. DMDS Dissanayake

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Mr. HM Senevirathne

Mrs. SWNA Samaraweera

Mrs. BADIU Bogoda

Mr. JA Chinthaka

Mrs. IS Disapali

Mr. HMRPB Herath

Ms. HSK Nilmini

Senior Staff Assistants (Clerical)

Mrs. MVM Fernando

Mrs. PVK Mallika

Laboratory/Support Staff

Mr. D Jayasiri

Mr. JPS Silva

Mr. HH Nishantha

Mr. R P U S Senarathne

Mr. W Chandradasa

Mr. BTR Bulathsinhala

Mr. KDTA Kumara

Mr. RMGPDB Rathnabahu

Mr. AK Chamara

Mr. PGC Wiranjeewa

Mr. MRGK Abeyrathne

Vehicle Staff

Mr. A Udayashantha
(Driver)

Mr. URD Disanayaka
(Helper)

Laboratory Facilities

The Department of Textile & Clothing Technology contains 12 laboratories which are equipped with state-of-the-art machinery and equipment. These laboratories help students to carry out the necessary practical work and research related to their studies. A brief overview of the laboratories is given below:

Spinning Laboratory

The spinning laboratory houses a range of spinning machines. Students are given hands-on experience on these machines, which cover the spinning preparatory, spinning and finishing stages of yarn manufacture.

Lecturer in charge: Prof. GLD Wickramasinghe
Technical Officer: Mr. JA Chinthaka
Laboratory Attendant: Mr. D Jayasiri

Weaving Laboratory

The weaving laboratory is equipped with machinery used for weaving preparation, as well as a number of looms of shuttle, rapier, air jet and water jet types. These machinery were obtained under a JICA grant.

Lecturer in charge: Prof. EASK Fernando
Technical Officer: Mr. HMRPB Herath
Laboratory Attendant: Mr. RPUS Senarathne

Knitting Laboratory

The knitting laboratory is equipped with Shima Seiki flat bed knitting machine, Hand flat knitting machines and multi-feeder circular knitting machines. One circular knitting machine and a flatbed knitting machine were provided under the ADB Science and Technology Personnel Development Fund.

Lecturer in charge: Dr. WDG Lanarolle
Technical Officer:
Laboratory Attendant: Mr. BTR Bulathsinhala

Physical Testing & Quality Control Laboratory

This laboratory is one of the busiest in the Department, serving students of both degree programmes for practical classes as well as testing work related to projects, assignments and research. The laboratory is equipped with two universal tensile testing machines and several modern equipment.

Lecturer in charge: Mr. SN Niles
Technical Officer: Mrs. DMDS Dissanayake
Lab Attendant : Mr. KDTA Thushara
Labourer: Mr. W Chandradasa

Wet Processing Laboratory

The wet processing laboratory is equipped with a range of dyeing and printing machines. This laboratory is also used extensively by students for project and research work. Under the ADB Science and Technology Personnel Development Project the equipment was further enhanced by a number of modern hi-tech colour fastness testing machinery.

Lecturer in charge: Prof. UGS Wijayapala
Technical Officer: Mr. CP Malalanayake
Lab Attendant : Mr. KDTA Thushara
Labourer: Mr. W Chandradasa

Chemical Testing Laboratory

This laboratory is used by students from Level 1 itself for a range of subjects related to textile fibres. Facilities include electronic microscopes, rotational viscometer and extracting machines. The laboratory is also used extensively for project work. Some practical classes for students of other departments are also undertaken in this laboratory.

Lecturer in charge: Dr. USW Gunasekera
Technical Officer: Mr. CP Malalanayake
Lab Attendant : Mr. KDTA Thushara
Labourer: Mr. W Chandradasa

Clothing Laboratory

The clothing laboratory is equipped with more than 50 industrial sewing machines of different types. In addition there are different types of cutting machines and a fusing machine. A model of an Eton material handling system is also available. The laboratory is heavily used by students of all courses for the practical classes in garment manufacture and equipment technology, and for project work.

Lecturer in charge: Mrs. Vijitha Ratnayake
Technical Officer: Mr. HM Seneviratne
Laboratory Attendant: Mr. JPS Silva

Design Studio

The Design studio provides all the facilities to learn how to interpret a sketch or photograph of a simple design, and to drape and produce a pattern for it. The laboratory is equipped with all the equipment used for pattern developments and students are provided with 'hands on' experience on using French curves, grade rulers, tape measures, pattern notches, tracing wheelers etc. Dress stands are available for students to drape and observe the visual effect of their patterns.

Lecturer in charge: Dr. Nilanthi Heenkenda
Technical Officer: Ms. HSK Nilmini
Laboratory Attendant: Mr. JPS Silva

Computer Laboratories

The Computer Laboratories of the Department are widely used by students for academic activities. The original laboratory was established in 1991 with a donation from the Government of the Federal Republic of Germany to upgrade the level of Information Technology in the Department.

The Computer Laboratory is linked to all staff rooms and laboratories of the Department via the Departmental intranet, and provides internet and email, centralized printing and data communication facilities within the Department. The main student Laboratories are equipped with about 65 workstations, printers and scanners. All workstations have facility for browsing the internet and some others are limited to application software.

Lecturer in charge: Dr. TSS Jayawardene
Technical Officer: Mr. GHD Wijesena
Lab Attendant : Mr. HH Nishantha
Labourer : Mr. AK Chamara

CAD Laboratory 1- (Gerber)

The CAD Laboratory was set up in 2003 with the assistance of the ADB Science & Technology Personnel Development Project. The CAD system was supplied by the Gerber Garment Technologies Ltd., a leading provider of CAD support to the local garment industry.

The laboratory is one of its kind in the island that is equipped with all the necessary facilities to train 15 individuals at a time.

The laboratory is equipped with 15 work-stations with 12 scanners, 2 colour laser printers, 2-meter wide plotter, inkjet printer, digitiser table and a multi media projector.

Lecturer in charge:
Dr.TSS Jayawardene
Technical Officer: Ms. IS Disapali

CAD Laboratory -2 (Lectra)

Lectra is a world leading integrated technology solution software with CAD/CAM equipments, specifically designed for industries using fabrics, leather, technical textiles, and composite materials to manufacture their products. The CAD system in this laboratory was donated by Lectra International, the leading provider of CAD support to the garment industry.

The laboratory is equipped with all the necessary facilities to train 16 individuals at a time. The laboratory is equipped with 16 workstations with necessary CAD software.

Lecturer in charge: Prof. EASK Fernando
Technical Officer: Mr. HMPRB Herath

Pattern Design Laboratory (in Textile Extension Building)

This la boratory is equipped with facilties required for pattern production and sewing machines for making prototypes.

Lecturer in charge: Mrs. Thushari Wanniarachchi
Technical Officer: Mrs. SWNA Samaraweera
Labourer: Mr. MRGK Abeyrathne

Sewing Laboratory (in Textile Extension Building)

This laboratory is equipped with sewing machines for making prototypes and the facilties required for pattern production.

Lecturer in charge: Mrs. Niromi Seram
Technical Officer: Mrs. BADIU Bogoda
Labourer: Mr. MRGK Abeyrathne

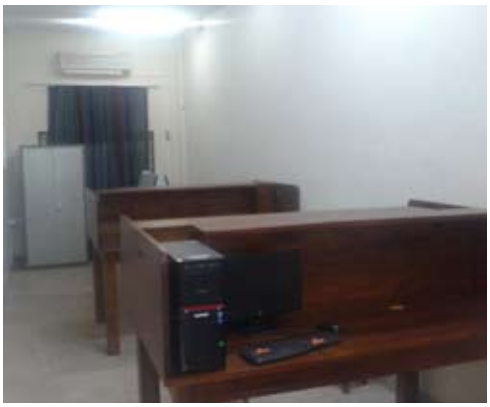
DIY Laboratory

"DIY" stands for Do It Yourself. Basic intension of development of this laboratory to provide hands on experience on design projects done under module TT 1963 Engineering Skill Development . It will be further used in conducting laboratory classes in TT 3262 Instrumentation and Programming for Automation module.

DIY laboratory basically comprising of two segments namely electronic work space and mechanical workshop. Electronic work space has two work benches facilitating four stations to work. It also equipped with electronic multi-meters, storage oscilloscopes, signal generators, DC regulated power supply, computer workstation equipped with simulation software (multisim), toolkits and furniture. Mechanical workshop equipped with a lathe machine, heavy duty work bench with a vice, a angle grinder, bench drilling machine, portable drilling equipment and many other gigs and tools.

Depending on the necessity of the students, the laboratory is planned to be open for the students after hours.

Lecturer in charge: Prof. EASK Fernando
Technical Officer: Mr. HMPRB Herath
Labourer:



Other Facilities

Student Common Room, Reading Room

The Student Common Room is located at the ground floor (Room 101) of the main building of Department. This room is used by students for general purposes including study and discussion. Students are requested to keep this room clean and tidy at all time, switch off the fans and lights when not in use, and refrain from consuming food or drink there.

LRC (Learning Resource Center)

The LRC is located at the ground floor (Room 108) of the main building of Department. LRC is developed under the Quality and Innovation Grant from World Bank. It contains traditional educational resources such as books, journals, as well as modern learning facilities such as software and audio/visual materials. The expectations of Learning Resource Centre are to promote self study, discussions and usage of multimedia faculties for education.

Department Vehicles

The Department has its own bus and a van, which are used for official visits to factories and other places pertaining to academic work.

Lecture Rooms

The Department has 5 lecture rooms which can accommodate about 50 students each, as well as one larger lecture room in the old building. All of these rooms are equipped with multimedia facilities. Lecture rooms suitable for smaller groups are also found in the Spinning, Weaving and Knitting Laboratories.

Auditorium

The Department has an auditorium capable of accommodating 160 individuals. The auditorium has multimedia facilities, and is used for normal lectures, guest lectures and for special programs of the Department and of student societies.

Textile Extension Building

The new Textile Extension Building is equipped with two design studios, lecture/workshop room and two tutorial rooms on its first floor and planning on students' self directed study areas, resource center and staff rooms to be on the first and second floors.

Central Facilities

The central library of the University provides the main library facility to the students. Around 450 students can be accommodated in the reference and reading sections. A large number of textbooks and journals are available for borrowing and reference.

A central computing facility is also currently housed in the library. Students may also find different areas for study purposes on different parts of the campus.

In addition to the above a medical centre is available with two doctors in attendance during working hours. All registered students of the University are eligible to meet the doctors and receive treatment and medication. Cases which cannot be handled by the centre will be directed to a hospital.

General Policy regarding the use of Facilities

1. The facilities of the Department are for the use of the entire Department, and students are requested to use them responsibly without disturbing others.
2. Please refrain from loitering in corridors during lecture hours and disrupting other lectures that are going on.
3. Consumption of food or drink within lecture rooms, laboratories or the student common room is strictly prohibited.
4. Please switch off all mobile phones during lectures and laboratory classes. If you are expecting an urgent call please place your phone on silent mode and leave the room if you need to answer the call.
5. Please note that caps should be removed while in the laboratory or lecture room.
6. Computers should be used for authorised purposes. The use of computers for the purpose of viewing or downloading unacceptable material, such as pornography, gambling etc. are strictly forbidden, and strict action will be taken against students violating this.
7. Laboratory facilities are used for practical classes. If these facilities are required for projects or assignments outside of these scheduled classes, a letter requesting these facilities should be sent through the lecturer assigning the projects. All equipment should be used under the guidance of an authorised member of the staff.
8. Working hours of the Department for academic purposes are from 8:15 am to 4:15 pm on weekdays. Additional work may take place after hours or on weekends.

Moratuwa University Textile Association (MUTA)

The Moratuwa University Textile Association is the alumni association of the Department. All graduates, undergraduates and permanent staff of the Department are eligible for membership. Student membership fee is Rs. 100/= per year. The life membership fee is Rs. 3000/=. MUTA acts as a forum for its members, to widen the interest and the knowledge of the members and to enhance social interaction.

MUTA has contributed immensely to the welfare of the students by regularly organising guest lectures on topics of interest, mentoring programs, speechcraft programs, orientation programme and mock interviews for students preparing for industrial training. MUTA also financially supports few BSc Engineering students every year. All students are encouraged to obtain membership of MUTA.

For further details contact Dr. TSS Jayawardene.

Textile Engineering Student Society (TESS)

The Textile Engineering Student Society is the student association of the BSc Engineering students of the department which was inaugurated in 2010. All BSc Engineering students of the Department are eligible to be members of TESS.

For further details contact Dr. TSS Jayawardene.

Fashion Design Student Society (FDSS)

The Fashion Design Student Society is the student association of the B.Design in Fashion Design & Product Development students of the department which was inaugurated in 2015. All B.Design students of the Department are eligible to be members of the FDSS.

For further details contact Dr. CP Vitanage.

Degree Programmes & Administration

The Department of Textile & Clothing Technology of the University of Moratuwa offers two degree programmes: the BSc Engineering degree in Textile & Clothing Technology, and the BDes Degree in Fashion Design & Product Development. Both these programs have been formulated with the needs of the Apparel and Textile Industry in mind, and periodic revisions are made to keep the courses relevant to the industry, as well as to provide students with a well-rounded education that will enable them to meet the challenges they would have to face in the working world.

For both degree programmes, students are admitted directly to the Department on the basis of the Z-score at the GCE Advanced Level examination. In addition, an aptitude test is held for the BDes degree programme.

BSc Engineering Degree Programmme

The BSc Engineering degree is a four year degree programme running according to a modular system. Each year of study is roughly divided into 2 semesters. During Semesters 1 & 2 the student learns the fundamentals of engineering in common with students of other disciplines, but with a few textile specific modules as well. In Semester 2 the students are also given opportunities to hone their practical engineering skills and to carry out an engineering design project. In addition, an Industry Orientation program is carried out, where the student spends few days in an industrial plant and obtains an introductory exposure to the textile and apparel industry.

In Semesters 3 & 4 the students receive instruction in fundamentals of textile processing and apparel manufacture, together with a module in computer programming and a number of mathematics and general engineering modules.Semester 5 builds on the foundation already laid, with aspects of management and quality control being taught as well. It is at this point that students begin to specialise in their chosen stream. At present the two streams available are Textile Process Engineering and Apparel Production Engineering. A number of focus areas and minors are in the pipline, and are to be finalised.

Students undergo a 6-month industrial placement, where they gain practical experience in a leading textile or garment manufacturing concern. Following this is a short semester 6 (semester 6), where students take a fewer number of course modules and two modules in humanities related areas.

In Semesters 7 & 8 students focus their learning based on the knowledge gained in the previous years as well as the experiences obtained during industrial training, and also carry out a final year project which is supervised by an academic staff member, as far as possible on industry-specific problems. The project is usually multi-disciplinary in nature.

A total of 150 credits are required to successfully complete the degree, of which a minimum of 135 accounts from GPA modules, and a minimum of 13 from non-GPA modules.

Vision of the BSc Engineering Degree Programme

To be the most sought after degree programme in Textile and Apparel related disciplines.

Mission of the BSc Engineering Degree Programme

- To provide competent well-rounded graduates for the benefit of national and regional communities.
- To maintain high standards and be subjected to continuous improvement in all aspects of teaching and learning.
- To produce graduates who excel in up to date knowledge, relevant skills and positive attitudes.

B.Design Degree Programme

The BDes course runs under a yearly system. Entry to this course is administered by the UGC and the eligibility requirements are published in the UGC Handbook. The minimum requirement to be admitted to this course is good GCE A Level results and a knack for creativity and interest in Design.

The University of Moratuwa holds an Aptitude Test in an attempt to evaluate the creative thinking abilities of the applicants. Thereafter the selection of candidates are carried out by the UGC by the prevalent University selection method.

The annual intake to this degree programme is 40. Tuition Fees are not charged but is usually termed as 'expensive' because of the course demands such as materials, visiting exhibitions and trade shows and study tours.

At University the FOUR years comprise of the following:

Year 1 - Introductory - Foundation & Experimental
Year 2 - Exploratory & Developmental
Year 3 - Industrial Placement - In industry under guidance
Year 4 - Definitive - Final year for Collections for Fashion Show

Subjects included and incorporated to the programme throughout the 4 years are;

- Visual Studies
- Fashion & Textile Design
- Product Development & Garment Technology
- Pattern Cutting, Grading, fit & styling
- Garment Construction
- Textile Technology
- ICT, Cad Cam, Photoshop, Illustrator, Flash and other software
- Introduction to the Fashion Business – Buying, Marketing, Merchandising
- Production, Supply Cain, Sourcing and Global Strategies.
- Fashion Forecasting, Consumer Studies
- Historical and Cultural Studies
- English Language for Communication
- Personal Professional Development (PPD)

On completion of the course the student is expected to enter a broad range of Fashion industry related employment, self employment or pursue higher studies at postgraduate level.

In the industry, they are able to demonstrate a sound understanding of the Fashion industry, both Fashion Product and Process and deploy critical and analytical problem solving skills in relation to both aesthetic and commercial aspects of the Fashion and related product industry.

They are also able to demonstrate an ability to confidently articulate their ideas effectively through the use of visual, verbal and written media.

Graduation Fashion Show

The BDes Degree in Fashion Design & Product Development celebrates the work of its' graduating batches of students each year with their catwalk collections.

Each collection is designed to a theme and comprises of six complete brand new outfits during the final year of the degree. The collections are based upon in-depth research of a particular market and a customer. The research begins with a strategic proposal to identify a particular label, designer or market segment. The outcome of research leads to develop a brand new idea to a wearable design by solving problems related to manufacturing, pattern development, and design development to achieve the final collection of outfits.

Graduation Fashion Show March, 2016

Graduation Fashion Show March, 2016

Graduate Profile of a Textile Engineering Graduate

1.Apply knowledge of mathematics, basic sciences and engineering fundamentals to the analysis of complex engineering and technological problems in the textile and apparel industry.

2.Identify, investigate and analyse complex textile engineering and technological problems, research literature and formulate solutions, and reach substantiated conclusions.

3.Design systems, components and processes as solutions for textile engineering problems.

4.Conduct investigations of complex problems using research based knowledge and research methods.

5.Create, select and apply appropriate techniques, resources, and modern engineering and IT tools to complex engineering activities.

6.Assess societal, health, safety, legal, cultural and environmental issues related to professional engineering solutions.

7.Demonstrate broad knowledge of sustainable development concepts and practices required for dealing with contemporary issues related to professional engineering practice.

8.Demonstrate broad knowledge of ethical responsibilities and professional standards.

9.Demonstrate ability to function effectively as an individual and in multidisciplinary and multi cultural teams, with the capacity to be a leader or manager as well as an effective team member.

10.Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11.Demonstrate broad knowledge of management and business practices, including financial management, risk and change management.

12.Engage in independent and lifelong learning in the broad context of technological change.

Graduate Profile of a Fashion Design & Product Development Graduate

On completion of the course the student should be able to

- Demonstrate a sound understanding of the Fashion industry, a knowledge of both Fashion Product and Process
- Demonstrate a high level of competence in specialist area.
- Deploy critical and analytical problem solving skills in relation to both aesthetic and commercial aspects of the Fashion and related product industry
- Demonstrate an ability to confidently articulate their ideas effectively through the use of visual, verbal and written media
- Demonstrate the ability to apply the knowledge and skills acquired to new and varied situations which are to be encountered in the changing world of the Fashion industry
- Ability to assess personal, intellectual and professional capabilities and strengths in order to identify and plan areas of further personal development and progress.

The student is expected to enter a broad range of Fashion industry related employment, self employment or pursue higher studies at postgraduate level.

Course Administration

Courses in the Department function under various course coordinators, who are responsible for the administration of the respective courses at the given levels, and who report to the Head of Department. The course coordinators are as follows:

BSc Engineering Degree Program

Overall Coordinator	Dr. Geetha Dissanayake
Semester 1 & 2	Mrs. Vijitha Rathnayake
Semester 3 & 4	Dr. Nilanthi Heenkenda
Semester 5, Industrial placement	Prof. Sandun Fernando
Semester 6	Prof. Samudrika Wijayapala
Semester 7 & 8	Dr. Geetha Dissanayake

BDes Degree Program

Course Director	Dr. Nirmali de Silva
Overall Coordinator	Mrs. Thushari Wanniarachchi
Year 1	Dr. Virajini Karunaratne
Year 2	Dr. Rivini Mathararachchi
Year 3	
FIIS:	Mrs. Niromi Seram
Industrial Training:	Mrs. Thushari Wanniarachchi
Year 4	Mrs. Ayesha Wickramasinghe

The above staff members also fun ction as academic advisors for the respective courses.

Teaching and Learning

All classes in the Department, as well as the time table, have been structured to help the student to get the optimum benefit.

At the beginning of each module the student will be provided with the syllabus and Learning Outcomes of the module, so that he/she can structure his/her learning accordingly. Visual aids, printed lecture notes and other teaching material are used. Some lecturers will make their notes available on the Department Intranet for access by students.

Please note that what takes place at the lecture is important, and on no account should students attempt to stay away from lectures and do only with the lecture notes. Students should also supplement their lecture notes by self-study, referring to materials in the library and on the internet, and by checking out practical aspects for themselves in the laboratories. Students are also encouraged to ask questions in class, and to meet the lecturer or instructor to clarify any doubts. Students who do not attend classes will not be allowed to submit in-class assignments for classes they have missed.

Examinations & Assessment Strategy

All students are required to achieve a minimun of 80% attendance at all classes. However, students are advised that in the case of some modules, particularly laboratory classes, 100% attendance may be required for the student to get sufficient marks.

Continuous assessment carries 30% upwards of the final mark for the BSc Engineering examinations. This means that all tutorials, assignments and laboratory work should be completed and submitted, and a required grade obtained. Students are expected to obtain minimum of 35% from both continuous and end semester examnation to pass a course module. Continuous assessment may take the form of practical reports, viva, spot tests and quizzes, assignments and oral presentations. Assessment criteria may differ for different modules, and it is the student's responsibility to ensure that he/she meets the criteria for each module. Late submissions may be penalised or even rejected.

Students who have medical or other problems are requested to contact an academic advisor at the earliest opportunity and work out some solution with regard to academic activities. All such solutions should be according to recommended University procedures.

Mentoring & Development

At present the Department, in collaboration with its alumni association, has organised an annual speechcraft program to help students to improve their leadership and communication skills. This program is organised by the Moratuwa University Textile Association in collaboration with the Colombo West Rotaract club, and conducted by the Millenium Toastmasters club. Currently it is restricted to 25 students at a time. Each student is taken under the wing of a toastmaster, who will help him/ her to develop both leadership and public speaking skills.

In addition to this, the alumni of the Department function as mentors to the students, and are available to help them during their industrial placement and also a special mentoring programme was recently introduced in focusing small groups of students being continuously mentored by an appointed mentor throughout their staying in the University.

Students are also given access to follow special English and communication skills development courses conducted by the English Language Teaching Centre of the University.

Student Records

Student performance records are maintained by the overall degree course coordinator or course director, and by the respective level/ year coordinators.

Awards & Scholarships

The Hirdaramani Memorial Trust Gold Medal is awarded annually to the BSc Engineering student of the Department obtaining the best overall GPA of 3.8 or more. If no student meets this criteria the best student having at least a GPA of 3.7 receives the Hirdaramani Memorial Trust award at the convocation.

The MAS Holdings Gold Medal is awarded annually to the B.Design student of the Department obtaining the best average of 85% or more at the convocation.

The MAS Holdings Award is offered for the Best Overall Student in the BSc Engineering programme of the Department. Students in Level 4 of the degree programme may apply for the award, and a shortlist selected by the Department on the basis of overall performance during the degree programme will be then interviewed by a team from the Department and from MAS Holdings. The top 3 will be given a short project to carry out, based on which the final recipient of the award will be selected.

The A&E Award for the Best Industrial Trainee is offered to the BSc Engineering programme. Students who receive a stipulated minimum Cumulative Grade Point Average and a stipulated minimum mark at the Industrial Training module may apply, and a shortlist is expected to submit a brief report and make a presentation to a panel.

The Serendib Inspirational award, Commercially Creative Designer award, Menswear Designer award, Creative Knitwear Designer award, Innovative Designer award, Innovative Textile Fabric Designer award as well as the Outstanding Designer Brand award are given to Year 4 B.Design students at the Graduation Fashion Show. All the awards are dicided by a panel of judges based on the catwalk presentation.

The Nisal Fernando memorial bursary is awarded to a deserving final year student in the BSc Engineering programme. Selection of the award is based on academic performance and the financial need.

The '00 batch bursaries are donated by graduates of the 2000 intake of the BSc Engineering degree programme to be given to 3 students of Level 1 or 2 based on their financial need. Similarly bursaries are donated by the '07 and '09 batch of graduates to students in financial need.

BSc Engineering Honours Curriculum, Textile & Clothing Technology

The Textile & Clothing Technology curriculum is developed to award four focus areas are mentioned below.

01. Textile Engineering
02. Apparel Engineering
03. Colouration & Finishing of Textile
04. Technical textile

The students will have the choice in selecting modules to meet the criterion to obtain the above focus areas as graduate without any focus areas.

C –Compulsory O –Optional E –Elective

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 1										
MA1013	Mathematics	C	3.0	1/1	3.0				20	80
CS1032	Programming Fundamentals	C	2.0	3/1	3.0				20	80
ME1032	Mechanics	C	2.0	3/4	2.0				20	80
MT1022	Properties of Materials	C	2.0	3/4	2.0				20	80
EE1012	Electrical Engineering	C	2.0	3/4	2.0				20	80
TT1042	Textile Materials & Processes	C	1.5	3/2	2.0				30	70
CE1022	Fluid mechanics I	C	2.0	3/4	2.0				20	80
MN1012	Engineering in Context	C	1.0	-		1.0			30	70
EL1012	Language Skill Enhancement I	C	-	3/1	1.0				20	80
				Total for Semester 1			**17.0**	**1.0**		

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 2										
MA1023	Methods of Mathematics	C	3.0	1/1	3.0				30	70
EN1802	Basic Electronics	C	2.0	3/4	2.0				40	60
MT1812	Engineering Materials	C	1.5	1/1	2.0				30	70
TT1070	Introduction to Apparel Manufacturing	C	2.0	-	2.0				40	60
CS2812	Visual Programming	C	1.0	3/1	2.0				60	40
TT2012	Fibre Science	C	1.5	3/2	2.0				40	60
TT2093	Principles of Textile Machinery & Instrumentation	C	1.5	3/2	2.0				30	70
TT1974	Industry Orientation	C	-	-	--	1.0			100	00
TT1080	Pattern Technology I	C	1.0	3/1	2.0				70	30
DE2xxx	Humanities Elective I	E	2	-	2.0					
MN1030	Entrepreneurship Skill Development	O	0.5	3/2	--	1.0			70	30
				Total for Semester 2			**19.0**	**1.0**		

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 3										
MA2013	Differential Equations	C	2.0	-	2.0				30	70
MA2023	Calculus	C	2.0	-	2.0				30	70
ME1822	Basic Engineering Thermodynamics	C	1.5	3/2	2.0				30	70
TT2023	Principles of Yarn Manufacture	C	2.5	3/2	3.0				30	70
TT2162	Principles of Work Study	C	1.5	3/2	2.0				50	50
TT2044	Weaving Technology I	C	1.5	3/2	2.0				30	70
TT2033	Knitting Technology	C	2.5	3/2	3.0				30	70
TT2190	Communication Skills Enhancement	C	1.5	3/2	2.0				100	00
TT1964	Engineering Skills Development	C	1.0	3/1		2.0			100	00
MN1030	Entrepreneurship Skill Development *(cont)*	O	0.5	3/2		1.0			70	30
				Total for Semester 3			**18.0**	**2.0**		

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 4										
MA2033	Linear Algebra	C	2.0	-	2.0				30	70
MA3013	Applied Statistics	C	2.0	-	2.0				30	70
TT2063	Woven Fabric Structures & Analysis	C	2.5	3/2	3.0				40	60
TT2170	Apparel Technology	C	3.0	-	3.0				30	70
TT2074	Colouration & Finishing of Textiles I	C	2.5	3/2	3.0				30	70
TT2090	Quality Assurance	C	2.0	--	2.0				40	60
TT3910	Technical Report Writing	C	1.5	3/2		1.0			100	00
TT3112	Pneumatics	C	1.5	3/2	2.0				30	70
TT3920	Computer Applications in Textile Engineering	C	1.0	3/1		2.0			100	00
MN2010	Entreprereurial Leadership	O	1.5	3/2	2.0				50	50
				Total for Semester 4			**17**	**3.0**		

*Total of 14 credits to be taken from optional modules includec in Semester 4-8.

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments hrs/weeks	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 5										
MN3042	Business Economics & Financial Accounting	C	3.0	-	3.0				30	70
TT3150	Non Wovens and Technical Textiles	C	3.0	-	3.0				40	60
TT3063	Testing & Evaluation of Textile Materials	C	2.5	3/2	3.0		9.0		50	50
TT3270	Weaving Technology II	E	1.5	3/2	2.0				30	70
TT3280	Circular knitting	E	2.5	3/2	3.0				30	70
TT3290	Colouration & Finishing of Textiles II	E	1.5	3/2	2.0				40	60
TT3300	Pattern Technology II	E	1.0	3/1	2.0		6.0		70	30
TT3700	Instrumentation & Programming for Automation	O	2.5	3/2	3.0				40	60
MA3023	Numerical Methods	O	2.0	-	2.0				30	70
MN3010	Multidisciplinary Design, Innovation & Venture Creation	O	1.5	3/2	2.0				50	50
MN3020	Entrepreneurship Business Basics	O	2.0	3/1	3.0				50	50
				Total for Semester 5			**15.0**	**0.0**		

*Total of 14 credits to be taken from optional modules included in Semester 4-8.

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments hrs/weeks	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
TT3992	Industrial Training	C	-	-		6.0				
				Total			**0.0**	**6.0**		

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments hrs/weeks	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 6										
TT3160	Nano Technology I	C	1.5	3/2	2.0				40	60
TT3170	Quality Management	C	2.0	-	2.0				40	60
TT4113	Environmental Management & Sustainability	C	2.0	-	2.0		6.0		30	70
TT4371	Comprehensive Design Project (Textile)	E	1.0	3/1	2.0				100	00
TT4354	Comprehensive Design Project (Apparel)	E	1.0	3/1	2.0		2.0		100	00
DE2xxx	Humanities Elective II	E	2.0	-	2.0		2.0			
TT3310	Warp knitting & structures	O	2.0	-	2.0				30	70
TT3320	Equipment Technology	O	1.5	3/2	2.0				30	70
TT4262	Technical Textiles	O	2.0	-	2.0				40	60
				Total for Semester 6			**10.0**	**0.0**		

*Total of 14 credits to be taken from optional modules from Semester 4-8.

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments hrs/weeks	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 7										
TT4202	Design/Research Project	C	2.0	6	4.0				100	00
TT 4163	Control Systems & Applications	C	2.5	3/2	3.0				40	60
MN4122	Human Resource Management and Industrial Relations	C	2.0	-	2.0				30	70
MN4900	Professional Ethics	C	1.0	-		1.0	9.0	1.0		
TT4390	Modern Developments in Weaving Technology	E	2.5	3/2	3.0				40	60
TT4410	Textile Plant Maintenance Engineering	E	1.5	3/2	2.0				40	60
TT4213	Structural Mechanics of Yarn & Fabrics	E	1.5	3/2	2.0				40	60
TT4420	Textile Composites	E	1.5	3/2	2.0				30	70
TT4430	Pattern Technology III	E	1.0	3/1	2.0				70	30
TT4343	Work Place Engineering	E	2.0	-	2.0				40	60
TT4440	Advanced Colouration	E	1.5	3/2	2.0				40	60
TT4450	Nano Technology II	E	1.5	3/2	2.0		4.0		40	60
TT4460	Operations Research & Simulation	O	2.5	3/2	3.0				30	70
MN4102	Management of Information & Communication Technology in Organizations	O	2.0	-	2.0				30	70
MN4042	Technology Management	O	2.0	-	2.0				30	70
				Total for Semester 7			**13**	**1.0**		

*Total of 14 credits to be taken from optional modules from Semester 4-8.

Curriculum of B.Sc. Engineering Honours Degree Programme
Textile & Clothing Technology

Module Code	Module Name	Category	Lectures hrs/week	Lab/ Assignments hrs/weeks	Credits		Norm		Evaluation (%)	
					GPA	NGPA	GPA	NGPA	CA	WE
Semester 8										
TT4202	Design/Research Project	C	-	6	4.0				100	0
TT4170	Apparel Marketing & Merchandising	C	3.0	-	3.0				30	70
TT4180	Lean Manufacturing	C	2.0	-	2.0		9.0		40	60
TT4389	Advanced Yarn Manufacture	E	2.5	3/2	3.0				30	70
TT4400	Flat Knitting Techniques & Integrated Designing	E	1.0	3/1	2.0				100	00
TT4362	Computer-Aided Woven Fabric Design	E	1.0	3/1	2.0				100	00
TT4470	Textile Structures in Technical Textiles	E	2.0	-	2.0					
TT4480	Smart Textiles	E	1.5	3/2	2.0				40	60
MN4800	Supply Chain Management	E	2	-	2.0				40	60
TT4490	Computer Applications in Apparel Design	E	1.0	3/1	2.0				100	0
TT4500	Modern Finishing Techniques	E	1.5	3/2	2.0				30	70
TT4510	Production Planning & Control	E	2.5	3/2	3.0				40	60
TT4302	Colour Measurement & Colour Matching	E	1.5	3/2	2.0		4.0		40	60
MN4092	Management Skills Development	O	2.0	-	2.0				30	70
MN4022	Engineering Economics	O	2.0	-	2.0				30	70
MN4072	Small Business Management & Entrepreneurship	O	2.0	-	2.0				30	70
MN4010	Business Plan Development	O	1.5	3/2	2.0				70	30
MN4150	Project Management	O	2.0	-	2.0				50	50
				Total for Semester 8			**13**	**0.0**		
				To be taken from Optional / Electives from Semesters 4-8			**14**			
				Minimum for Graduation - GPA			**136**			
				Minimum for Graduation - NGPA				**14.0**		
				Minimum for Graduation - Total					**150.0**	

*Total of 14 credits to be taken from optional modules from Semester 4-8.

Textile & Clothing Technology

Students should fulfill the credit requirements specified below to obtain the degree with one of the focus areas;

(1) Textile Engineering

*Students should take TT4371 - Comprehensive Design project (Textile), and minimum 10 credits from the modules specified below;

Module code	Module Name	credits
TT3310	Warp Knitting & Structures	2.0
TT4261	Technical Textiles	2.0
TT4390	Modern Developments in Weaving Technology	3.0
TT4213	Structural Mechanics of Yarn & Fabrics	2.0
TT4389	Advanced Yarn manufacture	3.0
TT4400	Flat Knitting techniques & Integrated Designing	2.0
TT4362	Computer-aided Woven Fabric Design	2.0
TT4470	Textile Structures in Technical textiles	2.0

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(2) Apparel Engineering

*Students should take TT4354 - Comprehensive Design project (apparel), and minimum 10 credits from the modules specified below;

Module code	Module Name	credits
TT3320	Equipment Technology	2.0
TT4430	Pattern technology III	2.0
TT4343	Work Place Engineering	2.0
TT4302	Colour Measurement & Colour Matching	2.0
TT4510	Production Planning & Control	3.0
TT4490	Computer Applications in Apparel Design	2.0

Module Code	TT 1042	Title	Textile Materials and processes			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach fundamentals of fibre forming material properties, manufacturing processes and their historical developments so that the undergraduates know about textile fibre properties, reasons for their performance and their usage in selecting particular fibre/fibres in product development.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Describe historical development of textiles
2. Work in teams to research a given topic and present the findings.
3. Describe at least one manmade fibre forming process
4. Explain all the fundamental manmade textile fibre forming processes
5. Identify common textile fibres and report the observations
6. Conduct standard tests to identify common fibres and report the observations
7. Present and explain primary and secondary properties of textile polymers
8. Operate tri nocular microscope and the video microscope
9. Work in groups to conduct fibre testing work.

Outline Syllabus

1. History of Textiles
2. Introduction to textile processing
3. Primary and secondary properties of textile fibres
4. Identification of textile fibres
5. Introduction to textile fibre forming polymers
6. Manmade fibre spinning and processing

Module Code	TT 1070	Title	Introduction to Apparel Manufacturing			
Credits	2.0	Hours/ Week	Lectures	2.0	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To introduce the student to the Apparel Manufacturing industry so that they realize the potential opportunities in Sri Lanka and overseas

Intended Learning Outcomes (ILOs)

At the end of this module, students will be able to

1. Search for knowledge of the development of the textile and Apparel industries and to recognize useful databases
2. To Describe the operational sequence of manufacturing
3. To Comprehend and Explain the key areas of the manufacturing process and its importance
4. To learn related vocabulary through group exercise.

Outline Syllabus

1. Introduction to textiles and apparel manufacturing, history & background
2. Size and structure of the apparel industry in Sri Lanka
3. Apparel markets and overview of the global picture
4. Role of buyer, buying offices, buyer driven industry, 'Customer', 'Supplier' & 'Marketing'
5. Design & product development, sample making and approval from obtaining order to shipment, turnaround, contracts
6. Raw materials ordering/purchasing for Fabric and trims
7. Production process, sequence & technology
8. Cost implications, requirements of skilled and unskilled human resources; Labour intensive vs. capital intensive
9. Storage, methods, labels & packaging, shipment & dispatch.
10. Inspection and quality assurance.
11. Related vocabulary and practice

Module Code	TT 2012	Title	Fibre Science			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	TT 1042
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach how fibres are used in the textile industry and detailed properties of most common fibres together with new developments so that the undergraduates apply their understanding in fibre science in designing textile products, finding solutions to related problems in textile materials and processing.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Identify and explain the performance of textile fibres
2. Work in teams to conduct research on fibre properties and present the findings
3. Explain the importance of moisture relationship of fibres
4. Explain the properties of micro fibres and their applications
5. Explain at least one new development in fibre science
6. Design a given textile product by selecting the appropriate fibres
7. Conduct standard tests on given textile materials to find composition and moisture content and report the findings.
8. Work in groups to conduct fibre testing work.
9. Operate tensile testing machine

Outline Syllabus

1. Textile fibre usage and markets
2. Properties of Natural fibres
3. Properties of manmade fibres (Regenerated and synthetic)
4. Thermal, Optical and electrical properties of fibres
5. Moisture relationship of fibres
6. Micro / Nano fibres
7. New developments in fibre science

Module Code	TT 2093	Title	Principles of Textile Machinery and Instrumentation			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To provide students with the essential knowledge of power transmission mechanisms, sensing and actuation techniques used in Textile & Clothing machines so that it would be useful for the graduates in designing of required machines, jigs and attachments in the workplace

Intended Learning Outcomes (ILOs)

At the end of the module students will be able to:

1. Design basic electronic circuits required for signal conditioning of selected transducers and power transmission mechanisms for a particular application to meet full functional requirement
2. Identify the basic functionality of mechanical elements, sensing and actuation techniques used in machines
3. Apply the basic mathematical concepts and models to given processes in designing of power transmission mechanisms to conform the given specifications
4. Appreciate friction as a desirable features and modify the level of friction to meet specific designs

Outline Syllabus

1. Drives and their elements
   Belt drives, gears, gear drives, clutches, bearings and their applications, introduction to linkage mechanisms used in textile and clothing.
2. Transducers and instrumentation
   Transducers and its categorization, specifications and selection criteria of transducers, symbols, wiring diagram conventions, and standards of instrumentation, level, flow, temperature, position and pressure transducers, signal conditioning. operational amplifiers and applications
3. Programmable control
   Hard-wired control vs. programmable control, introduction to Peripheral Interface Controller (PIC), programming PIC with C, simulation and troubleshooting of PIC codes for simple automation tasks

Module Code	TT 1974	Title	Industry Orientation			
Credits	1.0	Hours/ Week	Lectures	-	Pre-requisites	None
GPA/NGPA	NGPA		Lab/Tutorials	100%		

Aim

To provide the basic knowledge on buyers, suppliers, markets, key processes and respective employees in the apparel manufacturing business.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Question and appraise technical details of industrial machines, functions and order processing sequence, Organizational structure, responsibilities of employees and procedures.
2. Explain the basic processes involved in apparel manufacturing.
3. Explain buyers, suppliers and markets of the apparel manufacturing world.
4. Differentiate the responsibilities of different employees of an apparel manufacturing organization.
5. Accept, appreciate & follow the operating rules of the facilitating factory.

Outline Syllabus

1. Manufacturing process in the apparel industry
2. Introduction to departments
3. Functions and order processing sequence
4. Organizational structure and responsibilities of employees
5. How to write a report

Module Code	TT1080	Title	Pattern Technology I			
Credits	2.0	Hours/ Week	Lectures	01	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	03		

Aim

To teach the concepts of pattern technology and different seams, stitches and operation sequence, so that graduates can apply the knowledge and skills to develop different a patterns in their professional careers

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Identify measurements required for different garment types, and match the same on mannequin
2. Explain different types of seams and stitches
3. Describe operation sequence of a basic top garment
4. Produce basic components using different construction methods
5. Develop patterns for a given sketch
6. Communicate positively towards developing accurate patterns and selection of other components

Outline Syllabus

1. Introduction to pattern making
2. Classification of Seams and stitches
3. Introduction to operation sequence
4. Pattern development for different garment components
5. Introduction to sewing machines
6. Stitching different samples

Module Code	TT 2023	Title	Principles of Yarn Manufacture			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach fundamentals of the yarn manufacturing process so that students will be able to use this knowledge to develop / analyze yarn properties to achieve the end user requirements

Intended Learning Outcomes (ILOs)

At the end of the module students would be able to:

1. Effectively use language associated with textile yarn and yarn production
2. Describe properties and performance of textile yarns
3. Investigate the evolution of various yarn manufacturing methods.
4. Critically evaluate the elements and principles used in different spinning systems.
5. Explain the factors that affect end-user decisions when selecting appropriate yarns
6. Recognize and take account of input from colleagues
7. Demonstrate effective time and task management

Outline Syllabus

1. Introduction to yarn manufacture and Classification of yarns.
2. Yarn numbering systems and yarn twist.
3. Blow room process;
4. Carding process;
5. Combing process;
6. Principles of Drafting
7. Draw frame;
8. Speed frame;
9. Ring spinning; General features, drafting, twisting and package formation. Limitations and recent developments in ring spinning.
10. Introduction to new spinning systems.
11. Introduction to filament yarn manufacturing, texturing and textured yarns properties.
12. Winding, Sewing thread construction, types and end uses.

Module Code	TT 2162	Title	Principles of Work Study			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	-
GPA/NGPA	GPA		Lab/Tutorials	1.5		

Aim

To provide students with knowledge of the method study techniques, work measurement techniques and evaluation methods of work done in an organization in order to attain the best possible use of available resources and thereby increase the productivity.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Identify, explain & apply method study techniques and improve processes.
2. Estimate operation / process times using any work measurement technique.
3. Evaluate human and system effectiveness using appropriate techniques
4. Challenge & develop systems to improve the productivity and measure the improvement.

Outline Syllabus

1. Method study steps, techniques
2. Work measurement techniques
3. Job/system evaluation techniques,
4. Productivity, efficiency, performance
5. Productivity improvement in an organization

Module Code	TT 4302	Module Title	Colour Measurement & Colour Matching			
Credits	2	Hours/ Week	Lectures	1.5	Pre-requisites	TT 3072
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach the principles and practice of colour measurement and colour matching in order that the graduate will be capable of evaluating the colour of materials and products to make an informed decision of its suitability of a given end use, thus ensuring the highest customer satisfaction in a competitive international market.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. To be aware of the various theories pertaining to colour perception
2. To be able to understand the issues relating to colour measurement and colour matching.
3. To be able to interpret colour measurement readings and define colour matching

Outline Syllabus

1. Theories of light & colour
2. Colour vision
3 Colour mixing
4. Instrumental colour measurement
5. Industrial methods of Colour evaluation
6. Chemical aspects of colour and colour matching.

Module Code	TT 2044	Title	Weaving Technology I			
Credits	2.0	Hours/ Week	Lectures	3.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

Teach the principles of operation and machinery in the weaving preparation process, mathematical methods to analyze and calculate technological and mechanical parameters of winding, warping and sizing processes, the basic principles of fabric formation, the importance of winding and warping processes and the existing techniques and, to develop and engineer the technological processes and machines of winding warping and sizing of a modern textile industry for any given product with required quality and quantity.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Describe technological process, key theories and definitions of weaving and weaving preparation.
2. Select correct technological process, compare & contrast the different technological processes and machines used to produce cotton and synthetic fabrics in modern weaving industry.
3. Calculate efficiency & production of weaving preparation& weaving and define & calculate necessary technological parameters for smooth production process of cotton and synthetic fabrics with high quality and efficiency.
4. Combine all theoretical approaches of weaving preparation process to explain fabric defects and judge the accuracy of theoretical approaches that is most applicable to given yarn.
5. Operate weaving preparation machines giving due consideration to safety precautions and to operate looming and pirn winding machines referring to instruction/operational manuals.
6. Participate in team problem solving activities and display ethical practice.
7. Communicate efficiently, clearly with professionals and subordinates and mange the time to meet the needs of the organization

Outline Syllabus

1. Winding/ purpose and functions of yarn preparation.
2. Cross winding and precision winding. Yarn traversing systems. Mathematical analysis of winding.
3. Yarn clearing systems, tension devices, principles and comparison.
4. Sectional warping, Direct warping, Yarn tension in warping, Calculations of direct and sectional warping, Yarn tension in warping.
5. Principals and objectives of sizing, sizing materials. Recipes and methods of size preparation and Sizing machines.
6. Pirn winding machines. Calculation of weft winding, Unifil mechanism.
7. Looming: Tying-in drawing-in, and pinning processes, faults and wastes in wrap tying and drawing in process.
8. General: classification of weaving machines. Introduction to shedding, picking and beat-up mechanisms. Take up and let-off mechanisms

Module Code	TT 2033	Title	Knitting Technology			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	none
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach the concepts of weft and warp knitting production techniques, basic knitted structures, their variations, and specialty fabrics, so that the graduates can apply knowledge and skills of knitting to make improvements in mass production of weft knitted fabric, modifications of their properties and develop different fabric types for suitable end uses.

Intended Learning Outcomes (ILOs)

1. State the importance of different knitting elements and demonstrate their function in knitting cycle
2. Rewrite the principles of two bar tricot and simple net structures
3. Explain production methods for specialty fabrics, their properties and end uses
4. Illustrate the needle, cam arrangement in circular knitting machine and calculate the production of circular knitting machine to improve the production
5. Analyze the given basic weft knitted fabric structures and their simple variations to a 100% accuracy level
6. Review the properties of basic knitted structures and their simple variations against their end uses
7. Adhere to the aforementioned code in the classroom and the laboratory
8. React appropriately and sensitively to contextual and interpersonal factors
9. Handle with care all laboratory equipment

Outline Syllabus

1. Introduction to knitting technology, Primary knitting elements
2. loop formation cycle using needles, secondary knitting elements
3. Cams, their functionality, different types of cams
4. Tension build up in knitting zone, lowering cam angle, theoretical loop length and robbing back
5. Negative and positive yarn feeding
6. Knitting actions- latch needle
7. Formation of knit, tuck and miss stitches
8. Basic four weft knitted structures, their production and properties
9. Variations of single jersey and cam arrangements to knit them in circular knitting machine
10. Variations of rib and interlock along with cam arrangements to knit them in circular knitting machine
11. Graphical representation of weft knitted structures
12. Production calculations in circular knitting and weft knitted fabric production
13. Introduction to specialty fabrics, properties and end uses
14. Knitting with compound needle in circular knitting machine
15. Introduction to warp knitting
16. Pattern mechanisms- chain links and solid cams
17. Knitting actions of bearded needle warp knitting machines, basic lapping movements, threading diagrams, two bar tricot structures

Module Code	TT 2190	Title	Communication Skills Enhancement			
Credits	2.0	Hours/ Week	Lectures	1	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3		

Aim

To provide opportunity and background knowledge and techniques so that the graduate may be capable of presenting his ideas verbally, with or without visual aids, in various situations, in order to convince and persuade his audience and achieve his objectives.

Intended Learning Outcomes (ILOs)

At the end of the module the student should be able to;

1. Make oral presentations in a professional manner, with and without visual aids.
2. Select presentation material to suit the context
3. Engage the audience with his/her presentation
4. Argue his/her point of view with confidence and in a convincing and effective manner.

Outline Syllabus

1. Basic communication skills
2. Speeches on varied topics – impromptu and prepared
3. Group communication skills
4. Listening skills
5. Presentations
6. Critical evaluation of presentations

Module Code	TT 3910	Title	Technical Report Writing			
Credits	1	Hours/ Week	Lectures	0.5	Pre-requisites	None
GPA/NGPA	NGPA		Lab/Tutorials	1.5		

Aim

To provide background knowledge and techniques so that the graduate may be capable of presenting his ideas, or his assimilation of the ideas gained through research, clearly and convincingly in an appropriate written form.

Intended Learning Outcomes (ILOs)

At the end of the module the student should be able to

1. Express his/her ideas clearly in written format
2. Prepare technical documents depending on the target audience
3. Prepare a written summary of a given piece of writing

Outline Syllabus

1. Technical writing process
2. Preparation of different types of technical documents
3. Writing of summaries
4. Citation

Module Code	TT 1964	Title	Engineering Skills Development			
Credits	2.0	Hours/ Week	Lectures	1	Pre-requisites	none
GPA/NGPA	NGPA		Lab/Tutorials	3/1		

Aim

To develop selected practical skills in technical drawing packages, electronic circuit simulation and engineering design essential in engineering learning and professional contexts so that graduates can perform efficiently and effectively.

Intended Learning Outcomes (ILOs)

At the end of this module students should be able to;

1. Use drawing packages and graphics editing packages for Engineering applications
2. Set the machine parameters and operate laboratory equipment of DIY laboratory independently following the instructions of the manuals
3. Complete simple project tasks with strict adherence to safety rules and procedures of the laboratory
4. Simulate and improve the functionality of simple electronic circuits using electronic workbench (MultiSIm) with scientific approach to troubleshooting
5. Apply scientific ,engineering principles and design techniques to design and develop a real product with available resources
6. Appreciate different views, work in a project team and arrive at consensus

Outline Syllabus

1. Introduction to engineering drawing packages such as CAD
2. Introduction to image editing software
3. Introduction to simple electronic circuit simulation with MultiSim software

Module Code	TT 4213	Title	Structural Mechanics of Yarn & Fabric			
Credits	2	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	1.5		

Aim

To teach the principles of yarn and fabric mechanics in order that the graduate may be able to model the properties and behavior of yarn and fabric in the development of materials for various end uses.

Intended Learning Outcomes (ILOs)

At the end of the module the student should be able to apply textile mechanics to model yarn and fabric properties

Outline Syllabus

1. Yarn structure & mechanics
2. Structural properties of woven fabrics
3. Geometry of knitted fabrics.

Module Code	TT 2063	Title	Woven Fabric Structures and Analysis			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	none
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach fundamentals of woven fabric structures so that students will be able to use this knowledge to develop / analyze woven fabric properties to achieve the end user requirements.

Intended Learning Outcomes (ILOs)

At the end of the module students would be able to:

1. Define and investigate the elements and principles used in the design of woven fabric structures
2. Describe properties and performance of different woven fabric structures
3. Create a fabric with appropriate aesthetic and physical performance and reflect on the relevant elements and principles of woven fabric structure and design
4. Analyze and develop woven fabrics specifications for the end use requirements
5. Explain factors affecting consumer decisions when purchasing different fabric structures
6. Plan, develop and evaluate innovative structures
7. Recognize and take account of input from colleagues
8. Demonstrate effective time and task management

Outline Syllabus

1. Elements of Cloth structure
   - 1.1. Weave and weave notation.
   - 1.2. Yarn count and crimp of thread removed from a fabric.
   - 1.3. Fabric weight calculation.
   - 1.4. Thread density and fabric cover factor
2. Plain weave and its derivatives
   - 2.1. Classification and properties of plain weaves.
   - 2.2. Derivatives of plain structures.
   - 2.3. Other methods of ornamenting plain weave fabrics
3. Twill weaves and its variations
   - 3.1. Classification and properties of twill weaves
   - 3.2. Regular twills, Diagonals, Herring bone twills etc.
4. Satin/ Sateen weaves.
   - 4.1. Definition and properties of satin/sateen weaves.
   - 4.2. Regular, irregular and other varieties of satin/sateen weaves.
5. Simple fancy weaves – Huck- a - back, Mock Leno, Distorted thread effects, Honey comb and its variations, Crepe weaves, Bed ford cords, pique.
6. Colour and weave effects.
7. Woven Jacquard fabrics (Straight draft, point draft, mixed draft).
8. Extra warp and extra weft pattering.
9. The principle of constructing multi layer fabrics. Study of Double cloths with emphasis on colour-weave effects.
10. Pile fabrics (Warp pile, weft pile, Terry toweling, Corduroys, Velveteen, velvets).
11. A brief introduction to carpet structures

Module Code	TT 2170	Title	Apparel Technology			
Credits	3.0	Hours/ Week	Lectures	3	Pre-requisites	-
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To provide the students with an overall knowledge needed for managing the functions of the manufacturing process in the apparel industry in order to maximize the performance.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Identify, explain and evaluate all the relevant functions of cutting, sewing & packing processes in apparel manufacturing.
2. Compute break-even efficiencies and explain requirements to minimize cost.
3. Design an appropriate incentive scheme.
4. Judge and identify operator training requirements, systems and effect of learning.
5. Gather, organize and deploy evidence, data and information to make decisions for improving sectional performances.

Outline Syllabus

1. Cutting room functions (markers, laying, cutting, cut order plans & bundling)
2. Sewing room systems in an apparel manufacturing organizations
3. Material handling systems in an apparel manufacturing organizations
4. Production systems
5. Layout systems
6. Inspection systems
7. Pressing section
8. Packing section
9. Line balancing
10. Wages and incentives
11. Garment costing & cost
12. Operator Training

Module Code	TT 2074	Title	Colouration and finishing of Textiles I			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	none
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To gain knowledge on fundamentals of preparatory, colouration & finishing techniques of textile substrates. This subject aims to provide students with an in depth knowledge of the principles of textile preparatory processes and prepare students with extended knowledge and understanding of principles and technology of coloration and finishing with special emphasis on the mechanism and chemistry of the processes.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Analyze and explain the methods , techniques and the functions of the different chemicals, used in the pre-treatment, coloration (dyeing and printing) and finishing of different textile materials
2. Evaluate the performance and serviceability of the fabrics at the different treatment stages
3. Analyze capacities and limitations of various pretreatment, dyeing, and finishing processes
4. Apply appropriate technologies for different end use purposes
5. Design and develop proper processing methods to avoid regular technical faults
6. Articulate and compare the influence of varying processing conditions on ultimate properties of finished products
7. Identify and handle problems from a professional perspective.
8. Cooperate efficiently in a team to achieve goals
9. Build up analytical strength and independent thinking
12 Demonstrate effective time and task management
10. Handle laboratory resources with care

Outline Syllabus

1. Overall introduction to colouration
2. Introduction to pretreatment
3. Introduction to dyeing
   - 3.1 Mechanism of dyeing
   - 3.2 Colour Theory , Colour Matching, Colour Measurement
4. Classification of Dyes
   Direct, reactive, Vat, Disperse, azoic, Pigment etc.,
5. Introduction to colour fastness and importance
6. Introduction to Printing

Module Code	TT 2090	Title	Quality Assurance			
Credits	2.0	Hours/ Week	Lectures	2	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To teach concepts and principles of quality assurance in the context of manufacturing industry, so that graduates can apply such knowledge in problem solving, managing and improving manufacturing processes in the Textile industry in order to be competitive in the international market through external customer satisfaction and internal process improvements.

Intended Learning Outcomes (ILOs)

At the end of this module students should be able to;

1. Define concepts of Quality and explain the significance of Quality Assurance in the context of a manufacturing system
2. Discuss and apply principles of economics of Quality to evaluate the effectiveness of a quality system
3. Apply knowledge of "Quality Control" tools for problem solving
4. Discuss and apply principles of Product and Process Quality Assurance in a manufacturing environment
5. Design and implement Quality Assurance systems/programs for manufacturing systems to achieve organizational goals and customer satisfaction
6. Respect values of customers and adhere to business ethics

Outline Syllabus

1. Introduction to quality assurance
2. Quality plan of an apparel manufacturing plant
3. Product inspection and auditing and auditing systems
4. Defect analysis
5. Process auditing
6. Economics of quality
7. Basic QC tools
8. Designing of quality assurance systems

Module Code	TT 3112	Title	Pneumatics			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach selected automation concepts and principles in compressed air systems (pneumatics) so that graduate will be able to use the knowledge in pneumatics to design most appropriate circuits and instrument them to a particular automation of Textile/apparel application.

Intended Learning Outcomes (ILOs)

At the end of the module students will be able to:

1. Investigate and explain pneumatic fluid power and its characteristics
2. Explain the functionality, underlying principle and applications of range of pneumatic and electro-pneumatic devices (actuators, control elements, flow control valves, solenoid valves, sensors, limit switches and other signal elements etc.)
3. Demonstrate safety practices in pneumatic and electro-pneumatic circuit/system and display systematic approach to troubleshooting of (electro) pneumatic circuits/PLC ladder programs
4. Apply pneumatic and electrical principles to design the circuits to achieve 100% conformity of given specifications
5. Simulate the circuits with FluidSim software up to 15 components to verify the exact functionality and to evaluate the performance of the circuit
6. Follow and interpret the details of the technical documents such as data sheets, circuit diagrams and arrange components to achieve cost effective functionality

Outline Syllabus

1. Introduction to compressed air
2. Compressed air generation and treatment
3. Pneumatic components
4. Pneumatic circuit design
   Boolean algebra as a tool for designing pneumatic circuits, displacement-step/time diagrams and representation methods of the sequence of actuator operations, diagrammatic representation of pneumatic circuits, basic pneumatic functions such as time delay, overriding, memory, logic gates, interlocking, locking; different system design approaches, safety aspects in circuit designing
5. Electro-pneumatics
6. Vacuum systems
7. Modern trends and current research trends
8. International standards of pneumatic and electro-pneumatics

Module Code	TT 3920	Title	Computer Applications in Textile Engineering			
Credits	2	Hours/ Week	Lectures	1	Pre-requisites	None
GPA/NGPA	NGPA		Lab/Tutorials	3		

Aim

To provide background knowledge and techniques so that the graduate may be capable of using computer packages to analyze data and interpret them accurately and to carry out simulations and automation tasks as required.

Intended Learning Outcomes (ILOs)

At the end of the module the student should be able to:

1. Apply computer tools to analyze and solve given problems in textile and clothing
2. Write macros to automate tasks
3. Carry out simple simulations and scientific computations related to textile and clothing

Outline Syllabus

1. Microsoft Excel
    - 1.1 Overview of Excel functionalities
    - 1.2 Excel Functions
    - 1.3 Charts, Pivot tables, lookup tables, filters
    - 1.4 Macros
2. Introduction to VBA
3. Introduction to Microsoft Access
4. Matlab
    - 4.1 Introduction to Matlab
    - 4.2 Overview of Matlab commands and syntax
    - 4.3 Data file handling and data manipulation
5. Introduction to statistical packages
6. Introduction of computer applications for simulation and modelling (Arena/Simulaor)

Module Code	TT 3150	Title	Non Wovens and Technical Textiles			
Credits	3.0	Hours/ Week	Lectures	3	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials			

Aim

To teach why non woven and technical textiles play a major role in fulfilling modern day requirements and future development trends with special attention to the raw material and production processes employed so that the undergraduates apply this knowledge in product development and finding solutions to related problems in processing of non woven and specific technical textiles.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain the evolution of Non woven textile materials and their current status
2. Should be able to apply the knowledge in designing non woven textile products
3. Discuss the importance of raw material properties and processing methods on the performance of the non wovens
4. Work in teams to conduct research on non woven processing and present the findings
5. Explain technical textiles uses and their properties
6. Explain the current world trends and new developments in nonwoven technical textiles

Outline Syllabus

1. Introduction to Non woven textile materials and their usage
2. Textile fibres used in Non wovens
3. Non woven production methods and properties
4. Introduction to technical textile usage
5. Technical textiles properties and applications
6. Recent developments in non wovens and related technical textile materials

Module Code	TT 3063	Title	Testing & Evaluation of Textile Materials			
Credits	3	Hours/ Week	Lectures	2.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach the principles and processes of the testing of textile properties and evaluating the results of the same in order that the graduate will be capable of selecting and/or developing materials and products for any given application to ensure the highest customer satisfaction in a competitive international market.

Intended Learning Outcomes (ILOs)

At the end of the module the student should be able to

1. Design & carry out testing programmes for various textile materials to an acceptable level of competency and accuracy.
2. Design a textile programme for a given application and logically and impartially evaluate the results to an acceptable level
3. Research available test methods and devices for a given application, critique the same and suggest alternative or additions to overcome their shortcomings
4. Design a test method or device that will test the intended property to a measure at least equal to an existing device or method

Outline Syllabus

1. Introduction to Textile Testing
2. Moisture Relations in Textiles (No practical)
3. Fibre Testing (Overview –length, fineness, maturity, trash content)
4. Yarn Testing
5. Strength of Textile Materials
6. Fabric Testing
7. Garment Accessory Testing
8. Miscellaneous Topics
9. Designing of testing schema for appropriate end use.
10. Standards & Specifications

Module Code	TT 3270	Title	Weaving Technology II			
Credits	3.0	Hours/ Week	Lectures	1.5	Pre-requisites	TT2044
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

Teach the working principles of operation of primary motions, theory of shed formation and weft insertion, calculation of Technological parameters of primary motions and selvedge formation. Develop and engineer the primary motions and technological parameters of shedding and weft insertion of modern weaving machine for any given fabric with required quality.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Describe technological process, key theories and definitions of shed formation and weft insertion.
2. Select correct primary motions such as shed formation mechanism and weft insertion system, Compare& contrast the different mechanisms of shed formation and weft insertion used to produce cotton and synthetic fabrics in the modern weaving Industry.
3. Identify the required technological parameters of shed formation and weft insertion weaving machines and define & calculate necessary technological parameters for smooth production process of cotton and synthetic fabrics with high quality and efficiency.
4. Compare all theoretical approaches of shed formation and weft insertion to point out fabric defects and predict the accuracy of theoretical approaches that is most applicable to given weft &warp yarn and the fabric to be woven.
5. Arrange and set timing of primary motions and selvedge formation mechanism of any loom to achieve required properties of given fabric.
6. Investigate and put ideas in solving problem activates as a team.
7. Share relevant information and communicate efficiently, clearly with professionals and subordinates and manage the time to meet the needs of the organization.

Outline Syllabus

1. Tappet shedding
2. Dobby shedding
3. Jacquard shedding
4. Deformation of warp and tension variation in shedding , calculation of shaft movement
5. Picking and checking – picking mechanisms, principles of checkingswell design and its influence
6. Mathematical analysis of shuttle movement
7. Different weft insertion systems, Air jet loom, water jet loom, rapier looms, and projectile loom
8. Analysis of different systems, comparison, Evaluation of weft insertion systems for different yarn and fabric types.
9. Selvedge mechanisms, selvedge formation any different looms, comparative analysis of selvedge.

Module Code	TT 3280	Title	Circular Knitting			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	TT 2034
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach various circular weft knitting techniques, needle selection mechanisms, effect of various yarn and machine parameters to achieve the high quality, attractive circular weft knitted fabrics as per the requirement of the buyer.

Intended Learning Outcomes (ILOs)

1. State the driving mechanism and secondary knitting elements used in circular knitting and demonstrate their functions
2. Explain mechanisms for knitting different types of specialty fabrics
3. Explain needle selection mechanisms available in circular knitting and select appropriate mechanism as per the requirement
4. Design and develop jacquard structures to 100% accuracy
5. Evaluate the parameter to knit quality circular knitted fabrics
6. React appropriately and sensitively to contextual and interpersonal factors
7. Handle laboratory resources with care
8. Challenge general rules of fabric designs to develop innovative designs

Outline Syllabus

1. History of Circular knitting
2. Driving Mechanism and secondary knitting elements
   2.1. Takedown mechanism
   2.2. Yarn feed systems
3. Direct and indirect needle control
   - 3.1 Pattern wheel
   - 3.2 Pattern comb
   - 3.3 Electronic needle selection mechanism
   - 3.4 Needle selection on seamless knitting machines
4. Principle of jacquard fabric production and types of jacquard fabrics
5. Principle of stripe fabric manufacturing
6. Production of fleece fabrics
7. Plated fabric production
8. Production of Plush fabrics using single sinker and double sinker techniques
9. Loop transferring techniques,
   - 9.1 Rib loop transferring
   - 9.2 Sinker loop transferring
10. Seamless garment manufacturing
11. Selection of yarns for circular knitting
12. Quality control in weft knitted fabric production
13. Knitted fabric defects
14. Socks knitting

Module Code	TT 3290	Title	Colouration and Finishing of Textiles II			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	TT 2074
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach concepts and principles of the dyeing and finishing of textiles to provide theoretical and practical knowledge of the subject so that graduates are able to apply these knowledge skills and attitudes in dyeing and finishing area in the local and global textile industry to improve aesthetic appeal of the textiles.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Define and investigate the importance of quality of water required for different purposes and effect of deviation of water quality in colouration, finishing and raising of steam
2. Identify functional finishes of textiles to meet the global trends in textile industry
3. Identify defects related to dyeing and finishing
4. Design and develop the most suitable and optimized machines and technological routes for rendering particular coloration and finishing effects on different textile products
5. Articulate and compare the influence of varying processing conditions on ultimate properties of finished products
6. Design and develop the most suitable and optimized machines and technological routes for rendering particular coloration and finishing effects on different textile products
7. Cooperate efficiently in a team to achieve goals
8. Demonstrate effective time and task management
9. Build up analytical strength and independent thinking
10. React appropriately and sensitively to contextual and interpersonal factors
11. Handle laboratory resources with care

Outline Syllabus

1. Introduction to water quality
2. Industrial application of dyeing.
3. Batch, continuous, Semi continuous, Piece Dyeing, Low Liquor ratio dyeing, Beam dyeing, Garment Dyeing, Dip Dyeing
4. Introduction to Finishing -
   Mechanical Finishing- Preshrink. Compacting
   Chemical Finishing- Softening, Flame retardant, Water Repellent

Module Code	TT 3300	Title	Pattern Technology II			
Credits	2.0	Hours/ Week	Lectures	01	Pre-requisites	TT1080
GPA/NGPA	GPA		Lab/Tutorials	03		

Aim

Introduce the student to the concept of designing men's wear patterns, examine several patterns in detail. Direct the student to design men's pattern resources and develop pattern for any given garment construction as per the buyers requirements.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Discuss requirements of interlining, needles and pressing for a given product
2. Practice operations in garment construction.
3. Analyze and develop operation sequence for men's garments
4. Develop trouser and shirt patterns for any given a specification
5. Communicate effectively to develop operation sequences of given garments

Outline Syllabus

1. Introduction to trouser and trouser components
2. Operation sequence of trousers and shirts
3. Interlining, Pressing and Pressing equipments, Needles
4. Different methods of zipper insertion
5. Pattern making and sewing
   - 5.1 Pattern development using draping technique
   - 5.2 Pattern construction for trousers and shirts
   - 5.3 Trouser and shirt grading
   - 5.4 Stitching a trouser

Module Code	TT 3700	Title	Instrumentation and Programming for Automation			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To provide selected programming techniques and teach programming language so that graduates can determine design architectures and program selected electronic devices to meet the essential programmable automation needs found in the textile and apparel field

Intended Learning Outcomes (ILOs)

At the end of the module students will be able to:

1. Write codes, compile and debug them for PIC and microcontrollers with C language
2. Simulate the performance of the PIC as per the code
3. Programme the PLCs with ladder diagrams and FPGA with Verilog to meet the automation needs
4. Appreciate different coding paradigms and justify the best coding approach

Outline Syllabus

1. Introduction to programmable devices
   Programmable devices such as ROM, PAL, PLA, PLD and their programming
2. Hardware Descriptive Language (HDL)
   Different HDL languages and their pros and cons, syntax of Verilog
3. Field Programmable Gate Arrays (FPGA)
4. PLC programming
5. Programming of microcontrollers
   Architecture of microcontrollers and their role in automation, microcontroller programming techniques, essentials of PIC and its programming
6. Hardware control
   Computer control of hardware elements and interfacing techniques, data acquisition, programming and software packages, use of high level language to control hardware modules
7. Servo controllers
   Fundamentals of servo controller, servo controller in industrial automation, set up of servo controller systems, auxiliary hardware for servo-controllers, Software codes to control servo mechanisms

Module Code	TT 3992	Title	Industrial Training			
Credits	6	Hours/ Week	Lectures	--	Pre-requisites	None
GPA/NGPA	NGPA		Lab/Tutorials	24 wks		

Aim

To develop technical and ethical skills required in the textile and apparel industry in order to achieve career objectives of the graduates.

Intended Learning Outcomes (ILO)

At the end of the module students will be able to:

1. Demonstrate the competence to complete a professional CV and instil confidence in facing In plant training interviews
2. Critically analyze real life situations in industrial organizations in the context of their related environments
3. Select appropriate training place to develop required skills to achieve career goals and professional development
4. Formulate appropriate theoretical and mathematical approaches of Textile Technology/Apparel Technology to determine suitable technological parameters and conditions to produce a given textile-based product/apparel based product
5. Outline appropriate testing programs to evaluate the quality of the selected raw material and end products.
6. Evaluate the production cost of the end product, environmental consequences of the technological process of the said product with emphasis to ethical practice with attention to rules and regulations.
7. Present and communicate appropriate findings clearly and effectively in a professional manner

Outline Syllabus

1. Professional CV writing and facing interviews
2. Selection of appropriate industrial training establishment
3. Induction to the workplace
4. Exposure to the working of each department of textile processing and/or apparel manufacturing facility.
5. Projects and assignments related to the work assigned by the training establishment
6. Professional report writing and presentations

Module Code	TT 3160	Title	Nanotechnology I			
Credits	2.0	Hours/	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA	Week	Lab/Tutorials	0.5		

Aim

To introduce the underlying principles and applications of nanoscience and nanotechnology including the characterization techniques, different nanomaterials, and the history to the future state development of nanotechnology so that the graduates can apply interdisciplinary scientific and engineering knowledge necessary to appreciate fundamental physical differences at the nanoscale.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Discuss the history of nanotechnology and where the field may evolve in the future
2. Explain the formation, types of nanostructures and their properties in nanoscale dimension
3. Describe carbon nanotubes, graphene and their current and future applications
4. Apply different nanochemistry concepts in order to manipulate nanoscale properties
5. Compare different characterization techniques available for nanomaterials and select appropriate techniques depending on the requirement
6. Adhere to the aforementioned code in the classroom and the laboratory
7. Comply with the safety precautions and regulations to be taken whenever dealing with hazardous chemicals, laboratory equipment
8. Respond effectively to the code of conduct of different institutes during industrial visits
9. Maintain an open and questioning mind towards new ideas and alternative points of view on Nanotechnology

Outline Syllabus

1. Introduction to Nanotechnology
2. Characterization and instrumentation of Nanomaterials
3. Unit cells, Bravais lattices, imperfections in solids, grain boundaries
4. Molecular orbital theory, chemical bonding and band gap energy
5. Types of materials- Semiconductors, metals, composites, polymers
6. Self-assembled monolayers- SAMs
7. Carbon nanotubes, graphene and their applications

Module Code	TT 3170	Title	Quality Management			
Credits	2	Hours/ Week	Lectures	2.0	Pre-requisites	TT2090
GPA/NGPA	GPA		Lab/Tutorials			

Aim

To develop understanding and application of Quality Management principles and practices in Textile and apparel industry

Intended Learning Outcomes (ILOs)

At the end of this module, students will be able to

1. Define the key concepts of quality
2. Describe the application of quality in manufacturing
3. Analyze single processes using quality management principles.
4. Evaluate an organization using pre-determined criteria
5. Use quality vocabulary appropriately

Outline Syllabus

1. Introduction to Quality Management & Objectives
2. Quality Gurus, Characteristics of Japanese Quality Control
3. International quality awards, Baldridge, European Q, National Q Award & Deming Prizes
4. Standards & Standardization and relevance to application
   Writing specifications for textile fabrics
5. Cost of Quality, P-A-F model
6. Design for Quality; Quality Function Deployment, House of Quality
7. Quality Control Tools
8. Concepts of Statistical Quality / Process Control
9. OC curves, Inspection, Six sigma
10. Total Quality Management, TQM elements, TQM and profitability, hallmarks of TQM organizations.
11. Continuous Improvement, Systematic approach, basic tools and techniques, SPC, Taguchi methods for process improvement
12. ISO 9000 – Quality Management Systems and related standards of importance
13. Quality in Productivity, 5S and Kaizen Continuous Improvement

Module Code	TT 4113	Title	Environmental Management and Sustainability			
Credits	2.0	Hours/ Week	Lectures	2.0	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To teach theories and principles of sustainable development and environmental issues in textile and apparel industry so that the graduates are able to develop environmentally friendly sustainable systems and processes.

Intended Learning Outcomes (ILOs)

At the end of this course, students will be able to;

1. Identify the sustainability issues in the textile and apparel industry
2. Analyze the impacts to the environment arising from the manufacturing process including the generation of solid waste.
3. Evaluate sustainability issues identified, work individually and/or in a group setting to develop and provide suitable processes/ systems to minimize the impact to the environment.
4. Demonstrate the ability to communicate effectively to a wider community regarding the sustainability issues in the textile industry and provide suitable solutions.

Outline Syllabus

1. Introduction to global warming and climate change
2. Sustainability issues in the textile and apparel industry
3. Resources conservation and recycling
4. Introduction to life cycle analysis and carbon foot printing
5. Eco-labeling
6. Certification

Module Code	TT 4262	Title	Technical textiles			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To introduce technical textiles and their commercial categorization with special attention to the usage of high performance fibres and new developments so that the students can use the knowledge in product development and innovations to be competitive in meeting emerging customer requirements.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Appraise the importance of high performance fibres in technical textiles
2. Explain each type of technical textiles used in commercial applications
3. Apply the knowledge in designing of technical textile products
4. Conduct research on given topic in the study area and present the findings
5. Conduct case studies and submit and present findings by working in groups
6. Explain the current world trends and new developments in technical textiles.

Outline Syllabus

1. High Performance fibres
2. Performance requirements of Technical Textiles
3. Detailed study of types of technical textile
4. New developments and trends in technical textiles

Module Code	TT 4371	Title	Comprehensive Design Project (Textile)			
Credits	2.0	Hours/ Week	Lectures	1.0	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/1		

Aim

Recall the technological process of woven, knitted and non woven fabric formation, teach the selection of appropriate textile machines to produce selected product with given specification, and calculation of production cost and .justification of chosen technological process of given textile product.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Identify textile base product for product design project on the basis of literature survey and information gathered from the industry.
2. Describe the type of raw materials and properties required to produce a given textile-based product.
3. Select the suitable technological process to produce a given textile-based product.
4. Combine appropriate theoretical and mathematical approaches of Textile Technology to predict suitable technological parameters and conditions for spinning, weaving and coloration& finishing processes to produce the given textile-based product
5. Outline appropriate testing programs to evaluate the quality of the selected raw material and end product.
6. Evaluate the production cost of the end product, environmental and other issues during the technological process of the said product to appraise the professional commitment to ethical practice
7. Deliver a project report and communicate results and findings efficiently and clearly with professionals and subordinates and manage the time to meet the needs of the organization.

Outline Syllabus

1. Identification of a textile-based application.
2. Selection of fibre type for the given application
3. Identification of required yarn properties and selection of yarn
4. Identification of fabric properties essential and desirable for the given application
5. Identification of most suitable fabric manufacturing method
6. Selection of suitable pre-treatments and dyeing and finishing processes for the selected application
7. Selection of testing program for the raw material and finished product
8. Costing of the product
9. Analysis of environmental and other issues

Module Code	TT 4354	Title	Comprehensive Design Project (Apparel)			
Credits	02	Hours/ Week	Lectures	01	Pre-requisites	TT1080
			Lab/Tutorials	03		

Aim

To teach the selection of a outfit fulfilling given guidelines, concepts of pattern making, garment construction, calculation of SMV writing sequence of operations and other important aspects involved in the garment development process so that the graduates will be able evaluate a garment for fit and construction and can enhance the productivity of development process to promote innovation.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Choose a design for given guidelines
2. Apply the knowledge in pattern making, garment construction, calculation of SMV, fabric consumption and costing
3. Construct a selected product/design virtually undergoing the whole product development process.
4. Critically evaluate the quality and the difficulties encountering the process of product development.
5. Assess the level of fit of the garment and develop necessary remedy actions to achieve the best fit level.

Outline Syllabus

1. Researching and sketching design ideas and finalizing the design
2. Garment costing
3. Pattern creation for the chosen design
4. Stitching the chosen design
5. Marker making and calculation of consumption
6. Developing operation breakdown

Module Code	TT 3310	Title	Warp Knitting and Structures			
Credits	2.0	Hours/ Week	Lectures	2.0	Pre-requisites	TT2034
GPA/NGPA	GPA		Lab/Tutorials	3/4		

Aim

To teach techniques of single needle bar fabric production and double needle bar warp knitting machines and the mechanisms required in manufacturing quality warp knitted fabrics and laces for apparel and technical applications.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain driving mechanism of warp knitting machines
2. Explain pattern mechanisms used in warp knitting machinery
3. Design new single needle bar warp knitted structures for apparel and technical applications
4. Design double needle bar warp knitted fabrics for apparel, technical and fully fashioned garments
5. Evaluate the quality parameters in manufacturing different warp knitted structures
6. Accept and appreciate the operating rules of facilitating factory during industrial visits
7. Question and appraise technical details of industrial machines and procedures
8. Judge the correct machine capability to knit different warp knit structures

Outline Syllabus

1. Machine Classification
2. Knitting Action of Compound needle machines
3. Driving Mechanism
4. Single needle bar fabric production
    - 4.1 Two Bar tricot structures
    - 4.2 Production of open work structures
5. Principles of laying in
6. Fall plate technique
7. Cut presser fabric production
8. Jacquard Raschel machines
9. Multi guide bar Raschel machine
10. Double needle bar fabric production
    - 10.1 Production of tubular fabrics
    - 10.2 Production of pile fabrics
11. Electronically controlled patterning mechanism- SU and servo
12. Fabric quality control
13. Production calculation
14. Knitted fabric geometry
15. Technical textiles related to warp knitting

Module Code	TT 3320	Title	Equipment Technology			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To develop knowledge and skills of sewing, spreading and cutting machinery used in apparel industry to enable students to effectively solve equipment related problems in apparel manufacturing.

Intended Learning Outcomes (ILOs)

At the end of this module students should be able to;

1. Explain the categorization and discuss applications of sewing, spreading and cutting machinery
2. Identify the elements and discuss the working principles of LS machine
3. Discuss the principles of stitch formation of LS, CS and OL
4. Discuss applications and compare and contrast material feeding mechanisms
5. Discuss the usage of sewing machine attachments
6. Apply knowledge of sewing machine mechanisms and stitching technology to analyze equipment related sewing defects
7. Adhere to the code of conduct in the laboratory and comply with safety procedures

Outline Syllabus

1. Introduction to sewing machine
2. Working principles of sewing machine
3. Stitching technology
4. Material feeding mechanisms
5. Sewing machine attachments
6. Fabric spreading and cutting equipment
7. Sewing equipment related defects

Module Code	TT4202	Title	Design/ Research Project			
Credits	8.0	Hours/ Week	Lectures	2.0	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials			

Aim

To facilitate quality undergraduate research so that the students are confident to enter a community of scholars within the field of textiles.

Intended Learning Outcomes (ILOs)

1. At the completion of design/ research project the students will be able to,
2. Articulate a clear research question or problem
3. Develop effective objectives for the project, a critical review of previous work in the field, and a theoretical foundation and coherent justification for the approach taken in the project.
4. Work in teams to develop and evaluate creative and innovative solutions to textile engineering problems of significant complexity.
5. Demonstrate the ability to communicate the results effectively through presentations and formal engineering reports substantive in nature with proper and complete structure and referencing of previous work.

Outline Syllabus

The students shall conduct a research project on a given or chosen topic, in accordance with the following guideline;

1. Identification of the research need

   This includes the study of the circumstances and situations leading to the research need and the significance and the viability of carrying out the project.

2. Literature Survey

   This is carried out in order to clarify the scope of the research. The students shall learn to make use of the available sources of information and ways of filtering the necessary data.

3. Finalizing the preliminary research and submission of a progress report

   The student shall submit a report on his/her findings on the preliminary investigation and should devise a plan to carry out of the further research.

   The student then, on the approval of a panel of staff members, shall proceed with the practical part of the research. It is necessary for the student to hold weekly meetings with the supervisor during the allowed time period.
   The student should finalize his/her research findings and submit a draft report to the supervisor on or before the stipulated date
   The student shall present his/ her findings before an evaluation panel consisting of the staff members for the final appraisal of the student's research ability and communication / presentation skills.

Module Code	TT 4163	Title	Control Systems and Applications			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To provide essential modeling techniques to model the control systems in textile and clothing machinery so that graduates can perform the essential automation needs found in textile and apparel process engineering

Intended Learning Outcomes (ILOs)

At the end of the module students will be able to:

1. Apply knowledge of modeling, and simulation of control systems in textile and garment industry to study the behavior of control systems under different operational conditions
2. Design of control systems with commonly available control modules and techniques to meet the control requirements found in Textile and apparel industry
3. Analyze the time response of these systems under different inputs and initial conditions to design the systems to meet fully functional conformity
4. Analyze a given control system for its stability using different stability assessment criteria to evaluate the control systems in textile and apparel industry
5. Use critical reflection to evaluate own work and justify the validity of the models developed

Outline Syllabus

1. Introduction to control systems
   History and development classical control systems, open loop and close loop systems
2. Modeling
3. Mathematical modeling of control systems, different representations of linear feedback control, dynamic modeling of first and second order systems, derivation of s-domain transfer functions, block diagram algebra and simplification, steady state error analysis and interpretation, multi-input multi output (MIMO) systems
4. Stability
   Steady state error analysis, gain and phase margins, stability criteria such as Routh Hurwitz criteria, root locus analysis, Nyquist and Bode plots,
5. Compensation
   Compensation of closed loop systems, PID control techniques and their parameter tuning
6. Application of control systems to textile and clothing processes
   Advanced theory of control to linear systems with application to textile processing systems, speed, temperature and position control systems applied to garment and textile processes, digital programmable controlling units, mechatronic applications, different sensing techniques and their use in control systems
7. Computer aided designing and analysis of control systems-Introduction to Matlab control system toolbox, use of it for designing and analysis of simple control systems

Module Code	TT 4390	Title	Modern Developments in Weaving Technology			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	TT2044
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

Teach the principles of operation of the Beat up motion, Secondary motions, stop motions of a weaving machine and multi-phase weaving, mathematical methods and calculations of technological and mechanical parameters of primary and Secondary motions and to develop and engineer the technological processes and mechanisms of weaving machines of a modern textile industry to produce textile product with high production efficiency and quality

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Describe technological process, key theories and definitions of beat up motion & secondary motions of weaving machines.
2. Select correct mechanisms of beat up motion and secondary motions of weaving machines, compare & contrast the weaving machines with different primary and secondary motions used to produce cotton and synthetic fabrics in modern Industry.
3. Calculate efficiency & production of weaving machines and define & calculate necessary technological parameters for smooth production process of cotton and synthetic fabrics with high quality and efficiency.
4. Combine all theoretical approaches of weaving process to explain fabric defects and judge the accuracy of theoretical approaches that is most applicable to given fabric.
5. operate weaving machines giving due consideration to safety precautions and to adjust and set timing of primary and secondary motions of shuttle and shuttle lees looms referring to instruction/operational manuals and theoretical knowledge gained during the course of study.
6. Participate in team problem solving activities and display ethical practice.
7. Communicate efficiently, clearly with professionals and subordinates and mange the time to meet the needs of the organization.

Outline Syllabus

1. Beat – up process
2. Beat – up mechanisms
3. Theoretical analysis of slay mechanism
4. Let of motion
5. Influence of the backrest on fabric quality
6. Take up motion
7. Different tyresay take –up mechanisms
8. Warp stop motion
9. Weft stop motion
10. Weft replenishing mechanisms
11. Weft patterning
12. Loom performance
13. Multi-phase weaving
14. Production of special fabrics

Module Code	TT 4420	Title	Textile Composites			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

An introductory study of natural and engineered polymer composites, design principles, fabrication, processing and characterization methods of composites including new technologies of composite fabrication so that students will be able to apply their knowledge to review manufacturing methods and design different composite materials.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain manufacturing principles of composites
2. Demonstrate the surface treatment of filler components
3. Explain different characterization techniques used in analyzing polymer composites
4. Review the properties and characteristics of textile composites
5. Respond effectively to the code of conduct of different institutes during industrial visits
6. Adhere to the aforementioned code in the classroom
7. Handle with care all laboratory equipment
8. Handle all laboratory chemicals safely knowing their hazardousness

Outline Syllabus

1. Introduction to polymer composites
2. Design principles of composites
   - 2.1. Materials and fabrication techniques
   - 2.2. Effects of fiber length, orientation and loading
3. Manufacturing and processing methods of composites
4. Surface treatment of filler components
   - 4.1. Silane, plasma and other treatment methods
   - 4.2. Effects of surface treatment on composite properties
5. Characterization techniques for polymer composites
   - 5.1. Scanning Electron Microscopy (SEM)
   - 5.2. Atomic Force Microscopy (AFM)
   - 5.3. Infra-red and Raman microscopy
   - 5.4. Tensile Testing
   - 5.5. X-ray scattering techniques
   - 5.6. Thermal Analysis
6. Textile Composites
7. Bionanocomposites
8. Latest advances in engineered composite fabrication

Module Code	TT 4430	Title	Pattern Technology III			
Credits	2.0	Hours/ Week	Lectures	01	Pre-requisites	TT1080, TT3300
GPA/NGPA	GPA		Lab/Tutorials	03		

Aim

Introduce the student to the concept of intimate wear patterns, examine several patterns in detail, apply these patterns to specific problems, analyze problems associated with pattern development and fitting issues in intimate wear and point the student to design effective patterns.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Develop draping skills and patterns using draping techniques
2. Explain terminology and types of bras and panties
3. Discuss the technology and applications of non-sew techniques
4. Analyze problems associated with pattern development, stitching and fitting of bras and panties
5. Critically evaluate applications, problems and suitability of fasteners and closures
6. Communicate effectively to solve problems related to garment construction and fitting issues

Outline Syllabus

1. Introduction to bra terminology and bra types
2. Sewing problems
3. Fasteners and closures
4. Non sewn techniques
5. Introduction to panty terminology and panty types
6. Pattern making
   - 6.1 Pattern development for bras
   - 6.2 Stitching a basic bra
   - 6.3 Pattern development for panties
   - 6.4 Identify and solving fitting problems

Module Code	TT 4343	Title	Work Place Engineering			
Credits	2.0	Hours/ Week	Lectures	2	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To provide the students, knowledge, understanding and skills to design & improve a work place by enhancing the performance and productivity while reducing the worker's fatigue and to maintain health and safety of the worker.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Recognize & value the appropriate diversity of human experience, human limitations and capabilities of the user with regards to work when designing, improving or evaluating workstations.
2. Judge & explain the work environment with respect to worker's comfort, efficiency, productivity and safety.
3. Identify the basics of Value Engineering to assure that the respective standard method is used for value engineering applications.
4. Identify the ergonomics standards and design requirements that would enable effective and efficient use of machines.
5. Judge and assess machines or objects that do not meet ergonomic requirements.
6. Apply ergonomics specifications & controlling ergonomics qualities during product design, development & manufacture.

Outline Syllabus

1. Introduction to safety Engineering
2. Workplace Accidents and Safety
3. Safety Management and Control
4. Safety Analysis Methods and Techniques
5. Human Factors in Safety, Safety Laws
6. Introduction to Ergonomics
7. Factors affecting human performance in systems
8. Principles of human relations
9. Performance related factors
10. Muscle use and anthropometry
11. Work Place design
12. Activity related Soft Tissue Disorders
13. Analysis of Risks of ASTDs in the workplace
14. Shift work
15. Value Engineering

Module Code	TT 4440	Title	Advanced Colouration			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	TT 2074
GPA/NGPA	GPA		Lab/Tutorials	3/2		TT 3290

Aim

To teach concepts and principles of the new dyeing, printing and finishing techniques to provide theoretical and practical knowledge of the subject so that graduates are able to apply these knowledge skills and attitudes in new dyeing, printing and finishing techniques in the local and global textile industry to help development of students' problem-solving ability related to these techniques.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Apply theoretical and practical knowledge in dyeing and finishing of textiles to end up with a fabric having a good aesthetic appeal with zero dyeing defects
2. Identify new techniques of dyeing to meet the global trends in textile and apparel market
3. Know the fundamental elements of textile and surface design
4. Identify and handle problems from a professional perspective.
5. Develop the ability to adapt new technologies.
6. Analyze and apply contemporary textile trends for textile printing.
7. Describe and apply the theories and principles related to the practical skills of textile printing and production, with due consideration of the various constraints.
8. Cooperate efficiently in a team to achieve goals
9. Build up analytical strength and independent thinking
10. Demonstrate effective time and task management
11. Handle laboratory resources with care

Outline Syllabus

1. New Techniques of dyeing
   Waterless, Plasma, Super Critical Dyeing, RFT approach, Zero Discharge
2. Preparation of Print paste
3. Techniques of Printing
4. Styles of Printing flock, Discharge, Burn out, Digital, Heat transfer -

Module Code	TT 4450	Title	Nanotechnology II			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	TT 3160
GPA/NGPA	GPA		Lab/Tutorials	0.5		

Aim

To present the underlying principles of synthesizing nanomaterials, chemical and physical properties of nanomaterials, and the applications of the emerging field of nanoscience and nanotechnology so that the graduates can apply interdisciplinary scientific and engineering knowledge necessary to evaluate different properties, synthesis routes and societal and technology issues that may impede the adoption of nanotechnology.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Apply the fundamental principles that underpin nanotechnology materials and devices, including quantum physics, and molecular physics
2. Explain the conventional and emerging synthesis techniques available for nanomaterials
3. Apply different nanochemistry concepts in order to manipulate nanoscale materials, devices and exploit for new applications
4. Explain the role of Nanotechnology in society and the constraints within which their engineering judgment will be exercised
5. Evaluate and analyze the mechanical, chemical and other properties of bulk nanostructured metals, nanocomposite and carbon nanotubes depending on their requirement
6. Maintain an open and questioning mind toward new ideas and alternative points of view on Nanotechnology
7. Show interest in other viewpoints sensitively and respond effectively
8. Revise judgments and change behavior in light of new evidence

Outline Syllabus

1. Conventional and emerging Nano manufacturing techniques.
2. Homogeneous and heterogeneous nucleation.
3. Colloids and colloidal chemistry
4. Layer by layer assembly
5. Thin film preparation
6. Sol-gel, Micelles and micro emulsions, Cluster compounds
7. Quantum mechanics
8. Properties of nanomaterial
9. Nanobiotechnology and bio mimicking
10. Nanotoxiology, Environmental and Societal impact

Module Code	TT 4460	Title	Operations Research and Simulation			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To appraise the analytic tools & simulation techniques used for optimization of resources at strategic level of management so that the graduates can carry out rational project appraisal & objective managerial decision making

Intended Learning Outcomes (ILOs)

At the end of the module students will be able to:

1. Apply OR techniques to provide acceptable solutions to relevant problems in the industry
2. Simulate processes found in manufacturing process to have a deeper understanding of different scenarios under diverse operational conditions
3. Analyze and evaluate the projects in a rational way to take objective managerial decisions
4. Argue and debate about different views in formulation of the objective function and arrive to a consensus in development of realistic models

Outline Syllabus

1. Introduction to operational research
   Soft OR techniques, characteristics of linear programming problems, algebraic and spread sheet modeling
2. Solving linear programming problems
   Converting to standard linear programming problem, graphical and simplex method, applying Solver to spread sheet modeling, limitations of Solver
3. Special cases of linear programming problems
   Integer programming, optimal cost/time transportation and assignment problem, matrix based approaches to solve linear programming problems
4. Sensitivity analysis
   Parametric programming, duality and dual simplex methods
5. Dynamic programming
   Inventory control, resource smoothing and allocation
6. Goal programming and its applications
7. Knapsack problem and cutting stock problem
8. Decision theory and decision analysis
9. Queuing theory
10. Computer solutions to OR problems

Module Code	TT 4389	Title	Advanced Yarn Manufacture			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	TT 2023
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach advanced yarn manufacturing methods so that students will be able to use this knowledge to develop / analyze yarn properties to achieve the end user requirements.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain the principles and techniques underlying different yarn manufacturing systems
2. Explore and effectively use yarn manufacturing techniques to produce/source yarn for appropriate end uses
3. Compare and contrast yarn manufacturing methods as applied to various end uses
4. Perform yarn production related calculations; and measure values such as yarn counts etc. using various systems of measurement
5. Exercise logical, critical, and creative thinking in the areas of innovative textile yarn applications
6. Recognize and take account of input from colleagues
7. Demonstrate effective time and task management
8. Work effectively as a member of a team

Outline Syllabus

Introduction to long staple yarn manufacture. Woolen , worsted and semi-worsted Spinning.

1.1 Woolen and worsted carding and spinning.

1.2 Drawing and twisting, twisted and twist less roving production.

2. New methods of staple yarn manufacturing systems.

2.1 Open-End spinning, Rotor and Friction spinning

2.2. Air-jet and Vortex spinning.

2.3 Self-twist, twist less and other new spinning systems.

3.0 Synthetic filament yarn production

3.1 Filament yarn production.

3.2 False-twist texturing.

3.3 Air-jet texturing and interlacing.

3.4. Methods of yarn covering

4.0 Current trends and recent developments in yarn manufacture.

4.1 Appraisal of current blends, blends designed to specific uses.

4.2 Recent research in carding and their application to processing.

4.3 Performance in modern high speed draw frames.

4.4 Application of automation to modern ring spinning.

5.0 Theory of yarn manufacture – selected topics.

5.1 Fibre migration characteristics of spun yarn and continuous filament yarn.

5.2 Blending efficiency, tolerances and index of blending irregularity.

5.3 Theory of drafting, forces acting in the drafting zones, fibre control.

Module Code	TT 4170	Title	Apparel Marketing & Merchandising			
Credits	3	Hours/ Week	Lectures	3.0	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To enlighten the student on how fashion buying, selling and marketing takes place and the importance of merchandising function at both supplier and retailer ends.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Define the market segments, key retailers and related suppliers
2. Analyze the market strengths using defined criteria
3. Apply these in the supply chain activities in apparel business
4. Evaluate the Sri Lankan industry with respect to capabilities.

Outline Syllabus

1. Introduction to Fashion Marketing
2. Importance of marketing, the marketing mix 4P's, 7Ps, season, range, price, product
3. Fashion buying and merchandising, structure of a company, key roles & responsibilities.
4. Fashion market levels, segmentation. Types of retail and their selling strategies with examples.
5. Merchandising planning, controlling stock- Weekly sale, stock and intake plan.
6. Stock management, Open to buy, budget for season.
7. Sourcing and managing the supply chain; development of a merchandising calendar.
8. Supplier side merchandising and merchandiser role and team.
9. FTAR Supply chain members, Critical path, Supply chain concepts, importance and relationship to merchandising
10. Merchandising planning, Changes in World trade & Sri Lanka's position
11. Understanding the Consumer, Trends in Apparel Business
12. Value chain enhancement through new product development
13. Changes in World trade & Sri Lanka's position
14. Development of a marketing plan

Module Code	TT 4400	Title	Flat Knitting techniques and Integrated Designing			
Credits	2.0	Hours/ Week	Lectures	1	Pre-requisites	TT2034 & TT 3280
GPA/NGPA	GPA		Lab/Tutorials	3/1		

Aim

To impart knowledge, develop skills and build confidence required to analyze and knit flat knitted garments and design flat knitted garments using various flat knitting techniques so that the student would be able to combine these techniques to develop new designs and design knitted structures for technical textile applications.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain the current developments in flat knitting machines , flat knitting techniques and flat knitting machine controls
2. Confidently analyze a moderately complex flat knitted garment conscientiously and reproduce the same with acceptable quality and dimensions
3. Confidently operate a flat knitting machine and linking machine with caution
4. Determine optimistically any design errors that may appear during reproduction of a moderately complex garment
5. Determine optimistically any technical errors that may lead to problems such as breaking yarns/ stitches during knitting
6. Judge the basic machine adjustments needed in improving quality of the garment panel knitted
7. Design garment panels using various flat knitting techniques
8. Confidently present a design to a buyer
9. Share available resources respecting other members of the same group
10. Handle with care all the equipment and resources in the laboratory
11. Design effectively different weft knitted structures on their own

Outline Syllabus

1. Controls of the flat knitting machine
2. Draw threads
3. Designing Shape garment panel s
4. Needle selection mechanism on electronic flat knitting machines
5. Flat knitting technique-
   - 5.1. loop transfer and purl stitches
   - 5.2. slip stitch designs
   - 5.3. flaps
   - 5.4. split stitch and second stitch
   - 5.5. bind-off stitch
   - 5.6. cable stitch
   - 5.7. Intarsia using normal feeders and using intarsia feeders
   - 5.8. 3D knitting by stitch holding and cardign technique
6. Linking
7. Plaiting
8. Whole garment knitting

Module Code	TT 4362	Title	Computer Aided Woven Fabric Design			
Credits	2.0	Hours/ Week	Lectures	1.0	Pre-requisites	TT 3270
GPA/NGPA	GPA		Lab/Tutorials	3/1		

Aim

Teach the working principles of mechanical and electronic Jacuards, different types of woven labels and their structures used for apparels, Mucad software used for label designing and manufacturing, and develop and manufacture labels with and narrow fabrics with given specifications for different end uses.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain the functions of mechanical and electronic jacquard mechanism of weaving machines.
2. Draw technical diagrams of mechanical and electronic jacquard mechanisms of weaving machines and differentiate various electronic jacquards.
3. Select suitable technological process to weave taffeta, satin, semi satin and damask labels for the apparel Industry on jacquard looms
4. Combine all theoretical approaches of weaving process to select specification, analysis of yarn consumption and cost for any label required by the textile industry
5. Design taffeta, satin, semi satin and damask labels with help of modern label designing software to manufacture on high speed jacquard looms.
6. Analyze design defects of Taffeta labels, Satin Labels, Semi satin labels, Damask Labels, Care Labels and Printed Labels and share information with production staff to solve technical & production problems and to demonstrate the professional commitment to ethical practice.
7. Evaluate the key areas contributing to the quality and quantity by of product and smooth functioning of sophisticated modern jacquard looms

Outline Syllabus

1. Introduction and types of Jacquards.
2. the construction and working principles of modern mechanical Jacquards
3. the construction and working principles of Electronic Jacquards
4. Comparison of Various electronic Jacquards
5. Introduction to Narrow Fabric weaving
6. Fabric Structures for Labels on Jacquards looms
7. Introduction to hardware & software for Label and Woven Fabric designing

Module Code	TT 4180	Title	Lean manufacturing			
Credits	2.0	Hours/ Week	Lectures	2.0	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	-		

Aim

To measure, analyze and evaluate a system to apply principles of Lean and to create a lean thinking environment to systematic elimination of wastes to enhance profits of an organization.

Intended Learning Outcomes (ILOs)

At the end of this module, students will be able to

1. Extend existing knowledge of management principles to apply Lean principles
2. Demonstrate how to measure and analyze processes
3. Evaluate processes and organization in relation to implementing Lean techniques
4. Organize implementation of Lean principles in a selected unit of a manufacturing entity/company

Outline Syllabus

1. History of craft & mass production, Toyota and lean production
2. Lean principles, 3M model, wastes, customer value and introduction of value stream
3. Benefits of Lean, Spaghetti charts, tools & techniques for lean implementation
4. Value stream mapping, current state map & future state map introduction & features
5. Set-up reduction, Introduction, changeover time, internal & external elements, Long-term & short-term action plans
6. Visual factory, Introduction & applications; Pokayoke – Introduction. root cause analysis and applications. Lateral thinking examples
7. Total productive maintenance – pillars of TPM, types of losses, methods of analyzing chronic losses, quantitative approach in TPM,
8. Maintenance models
9. Cellular manufacturing – Introduction, group technology
10. JIT & Kanban – Introduction to JIT, Push & pull systems, Introduction to Kanban systems, rules, types, determination of number of Kanbans and implementation
11. Lean Assessment – Tools & techniques, assessment feedback, continuous improvement

Module Code	TT 4480	Title	Smart Textiles			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To introduce smart textiles and their commercial applications together with the current and emerging trends with knowledge of smart polymers, fibres and technologies used in fabrication of smart textiles. Detailed discussions will be held on electronic and medical textiles so that the students can use the knowledge in product development and innovations.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain the usage of smart textile
2. Explain the requirements of special materials used in fabrication of smart textiles
3. Discuss the categorization of smart textiles
4. Apply the knowledge in designing of smart textile products
5. Conduct research on given topic in the study area and present the findings
6. Work in groups to analyze a given scenario and suggest possible solutions using smart textiles
7. Explain the current world trends and new developments in smart textiles

Outline Syllabus

1. Introduction and Market information
2. Smart polymers and fibres
3. Categories of smart textiles
4. Technologies used in smart textiles
5. Types and applications of Electronic textiles
6. Types and applications of Medical / Medicated textiles

Module Code	TT 4490	Title	Computer Applications in Apparel Design			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	TT1080
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

Relate CAD/ CAM in apparel product development and apparel manufacturing process. Teach and train Gerber Accumark software to create patterns, grade patterns and create markers for apparel product specifications.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Identify role of CAD/ CAM in apparel product development process with reference to Sri Lankan export apparel industry.
2. Compare and relate manual pattern making Vs CAD/CAM applications in Sri Lankan apparel industry.
3. For the given size chart, identify relevant measurements and create patterns for base size accurately.
4. Grade basic patterns according to given size specification and create markers in order to optimize material consumption and customer requirements.
5. Give due respect to available resources and demonstrate leadership, willingness to corporate and team work.

Outline Syllabus

1. Discuss role of CAD/ CAM in apparel product development & mass manufacturing.
2. Relate CAD/ CAM applications in apparel design to manufacturing process- current topics and future trends in applications of CAD.
3. Recognize & differentiate available CAD/CAM apparel solutions in the market.
4. Pattern Digitizing.
5. Draft basic blocks according to the given size specification using computerized system.
6. Grade basic patterns according to given size specification or grading rule using computerized system.
7. Create markers in order to optimize material consumption and customer requirements. using computerized system.
8. Discuss marker efficiency improvements and cost implications in computerized marker making.

Module Code	TT 4500	Title	Modern Finishing Techniques			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	0.5		

Aim

To present the underlying principles of modern finishing techniques available for textiles, and the applications of those in the emerging field of textile, so that the graduates can apply interdisciplinary scientific and engineering knowledge necessary to evaluate different properties, application processes, process parameters of modern day finishing techniques for textiles

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain different emerging finishing techniques available for textile materials
2. Apply finishing theories and professional skills to develop textile end products to meet the demand of the industry and/or market
3. Relate advanced technologies in textile finishing to the development of novel textile materials, processes and end products
4. Execute their duties at work competently in different coloration and finishing organizations, including dye-houses, testing laboratories
5. Show interest in other viewpoints sensitively and respond effectively
6. Respond effectively to the code of conduct of different institutes during industrial visits

Outline Syllabus

1. Mechanical finishing
2. Softener finishing
3. Enzyme immobilization
4. Enzyme cross linking
5. Bio polishing
6. Microencapsulation
7. Production techniques for microencapsulation
8. Microencapsulated PCM
9. Nanotechnology in modern finishing
10. Coating techniques
11. Laminating techniques

Module Code	TT 4510	Title	Production Planning and Control			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	-
GPA/NGPA	GPA		Lab/Tutorials	1.5		

Aim

To provide knowledge of quantitative methods and analysis techniques used in planning and control in production processes so that the students will be able to organize, plan, coordinate and control the various operations of a production process in any industrial environment, ensuring the orderly flow of material at different stages of the production and the right quantity of the order produced at the right time with minimum efforts and cost.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Organize a production schedule in conformity with the demand forecasts.
2. Explain various aggregate planning methods which can be applied to specific situations and state their relationship to the product/ process involved.
3. Challenge & determine the best order scheduling and material requirement planning techniques in various specified situation.
4. Find most economical use of plant and equipment by scheduling best machine utilization.
5. Apply various techniques in financial evaluation, execution and monitoring of project and employ different techniques to reduce project duration and man power requirements by identifying their implications on the project's cost and risk.
6. Plan production facilities in the best possible manner by minimizing the total cost over the planning horizon, along with the proper systematic planning of production activities while co-ordinating the operations of various sections/departments responsible for production.

Outline Syllabus

1. Forecasting techniques
2. Capacity planning
3. Aggregate planning
4. Master Production Scheduling
5. Inventory Control
6. Material Requirement Planning
7. Scheduling Techniques
8. Network Analysis
9. Priority Sequential Rules
10. Assignment problems
11. Location of facilities
12. Project Appraisal

Module Code	TT 4410	Title	Textile Plant Maintenance Engineering			
Credits	3.0	Hours/ Week	Lectures	2.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To teach the concepts of requirements of air quality in textile plants together with maintenance and maintenance scheduling with attention to the types of waste generation and management so that the students can effectively apply the concepts to analyze maintenance issues and design appropriate solutions.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Explain concepts of boilers and their maintenance.
2. Discuss air quality requirements in textile plants
3. Explain the requirements of maintaining textile machinery and lubrication
4. Analyse the types of wastes and design appropriate solutions to manage waste
5. Adhere to code of conduct of the facilitating textile manufacturing facilities
6. Conduct case studies and submit and present finings by working in groups

Outline Syllabus

1. Boiler maintenance
2. Air Conditioning & Ventilation
3. Maintenance scheduling
4. Lubrication of textile machines
5. Classification and treatment of waste
6. Waste water treatment and recycling
7. Noise & Vibration control
8. Environmental regulations

Module Code	TT 4470	Title	Textile Structures in Technical Textiles			
Credits	2.0	Hours/ Week	Lectures	1.5	Pre-requisites	None
GPA/NGPA	GPA		Lab/Tutorials	3/2		

Aim

To introduce technical textiles structures and manufacturing methods used in modern technical textile applications so that the students can design technical textiles by considering the relationship between its structure and expected performance.

Intended Learning Outcomes (ILOs)

At the end of this module students will be able to;

1. Understand the importance of textile structure on the performance of technical textiles products
2. Conduct research on given topic in the study area and present the findings
3. Apply the knowledge in designing of technical textile products
4. Explain the types of textile structures used in technical textile products
5. Explain in detail at least two manufacturing methods employed in producing technical textile structures

Outline Syllabus

1. Technical filament yarns
2. Warp/Weft Knitted spacer fabrics
3. Multi-axial warp knitted structures
4. 3D Tri axial woven structures
5. Braided structures and products
6. Spatial Warp Knitted fabrics
7. Hybrid Woven/Knitted Structures
8. Malimo structures
9. Fibre Scaffoldings, Nonwoven and laminated structures

Curriculum of the BDes in Fashion Design & Product Development Honours Degree Program

Units with Assessment MAP YEAR 1

Year 1 - Term 1

code	Unit	Lps	Assessment Value
FD1010	Foundation Studies	20	50%
FD1020	Visual Studies	20	50%
FD1090	Learning Portfolio	** 1	Pass
		41	

Year 1- Term 2

code	Unit	Lps	Assessment Value
FD 1210	Design and Technical Studies in Fashion	20	50%
FD 1220	Design and Technical Studies in Textiles	20	50%
FD 1270	Introduction to Textiles for Design	***3	Pass
FD 1080	Historical and Contextual studies 1	**2	Pass
FD 1090	Learning Portfolio	**2	Pass
		47	

Year 1- Term 3

code	Unit	Lps	Assessment Value
FD 1310	Design Realisation 1 in Fashion **OR**	30 **OR**	55%
FD 1320	Design Realisation 1 in Textiles	30	55%
FD 1370	Textiles for Design 1	*7*	*20%*
FD 1350	The Business of Fashion / Textiles	10	15%
FD 1080	Historical and Contextual Studies 1	3	05%
FD 1090	Learning Portfolio	2	05%
		52	

** - Formative Mandatory
*** - Mandatory
Total Learning points 140

Units with Assessment MAP Year 2

Year 2 -Term 1

code	Unit	Lps	Assessment Value
FD 2110	Design Realisation 2 in Fashion **OR**	30 **OR**	70%
FD 2120	Design Realisation 2 in Textiles	30	70%
FD 2150	Business and Marketing	10	30%
FD 2080	Historical and Contextual studies 2	** 5	Pass
FD 2090	Learning Portfolio	** 1	Pass
		46	

Year 2- Term 2

code	Unit	Lps	Assessment Value
FD 2210	Design Realisation 3 in Fashion **OR**	25 **OR**	70%
FD 2220	Design Realisation 3 in Textiles	25	70%
FD 2350	Introduction to Production planning and the supply chain	10	10%
FD 2270	Textiles for Design 2	*5*	10%
FD 2080	Historical and Contextual studies 2	5	10%
FD 2090	Learning Portfolio	** 2	Pass
		47	

Year 2 -Term 3

code	Unit	Lps	Assessment Value
FD 2310	Industry linked Team project in Fashion **OR**	30 **OR**	75%
FD 2320	Industry linked Team project in Textiles	30	75%
FD 2370	Textiles for Design 3	5	10%
FD 2250	Introduction to Product strategy	10	10%
FD 2090	Learning Portfolio	2	05%
		47	

**- Formative Mandatory

Total Learning points 140

Units with Assessment MAP Year 3

code	Unit	Lps	Assessment Value
FD 3200	Industrial placement	*** 5	Pass
FD 3300	Fashion Industry Investigative Study report	30	100%
FD 3090	Learning Portfolio	*** 5	Pass
		40	

*** - Mandatory

Total Learning points 40

Units with Assessments MAP Year 4

Year 4 - Term 1 (Final Major Project Stage 1)

Code	Unit	Lps	Assessment Value
FD 4110	Concept Development and Project Proposal of final major project in Fashion **OR**	30 **OR**	70%
FD 4120	Concept Development and Project Proposal of final major project in Textiles	30	70%
FD 4150	Product Strategy and Production Planning	10	30%
FD 4090	Learning Portfolio	** 5	Pass
		45	

Year 4- Term 2 (Final Major Project Stage 2)

Code	Unit	Lps	Assessment Value
FD 4210	Design Development and Problem Solving of final major project in Fashion **OR**	30 **OR**	80%
FD 4220	Design Development and Problem Solving of final major project in Textiles	30	80%
FD 4270	Materials Analysis and Evaluation	10	20%
FD 4090	Learning Portfolio	** 5	Pass
		45	

Year 4- Term 3 (Final Major Project Stage 3)

Code	Unit	Lps	Assessment Value
FD 4310	Realisation and Evaluation of final major project in Fashion **OR**	40 **OR**	80%
FD 4320	Realisation and Evaluation of final major project in Textiles	40	80%
FD 4090	Learning Portfolio	10	20%
		50	

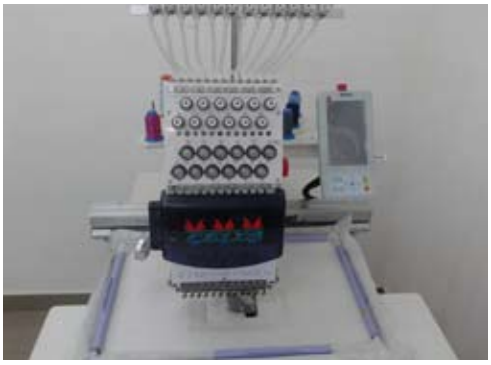
**- Formative Mandatory

Total Learning points 140

Recently Introduced Facilities

Textile Extension Building

Embroidery Facility - Textile Extension Building



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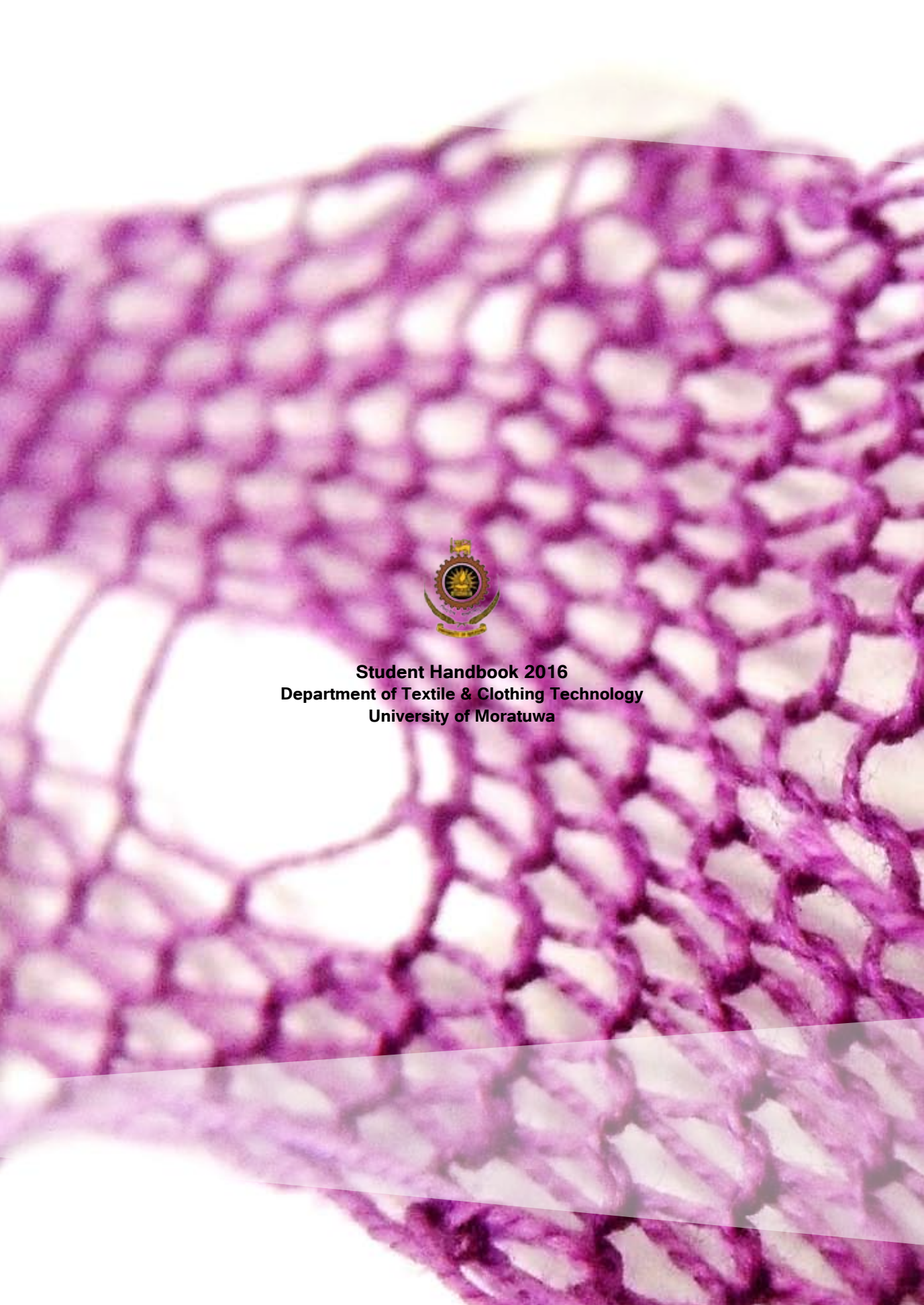

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Department of Textile & Clothing Technology

University of Moratuwa