CURRICULUM

Bachelor of Engineering Technology Honours (BET Hons)

Faculty of Technology

Sabaragamuwa University of Sri Lanka

P.O. Box 02, 70140, Belihuloya

January, 2019

DEPARTMENT OF ENGINEERING TECHNOLOGY

Program Learning Outcomes (PLO)

On successful completion of this program student should be able to,

1. Apply knowledge of basic Sciences, Mathematics, Engineering fundamentals and Mechanical Engineering Technology procedures, processes and systems.
2. Select, apply and adapt modern Engineering and IT techniques, resources and tools to broadly-defined Mechanical and Electrical Engineering Technology activities with an understanding of the associated limitations.
3. Undertake problem identification, formulation and solution of Mechanical and Electrical Engineering Technology problems using methods that involve appropriate experiments, analysis and interpretation of data and synthesis of information to reach valid conclusions.
4. Utilize a system approach to design and operational performance.
5. Effectively function as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as effective team member.
6. Acquire the understanding of the social, cultural, global and environmental responsibilities of the professional Engineer and the need for sustainable development.
7. Acquire the understanding of the principles of sustainable design and development.
8. Acquire the understanding of the understanding of professional and ethical responsibilities and commitment to them.
9. Communicate effectively on Engineering Technology activities with the Engineering community and with society at large.

GENERAL INFORMATION OF THE PROGRAMME

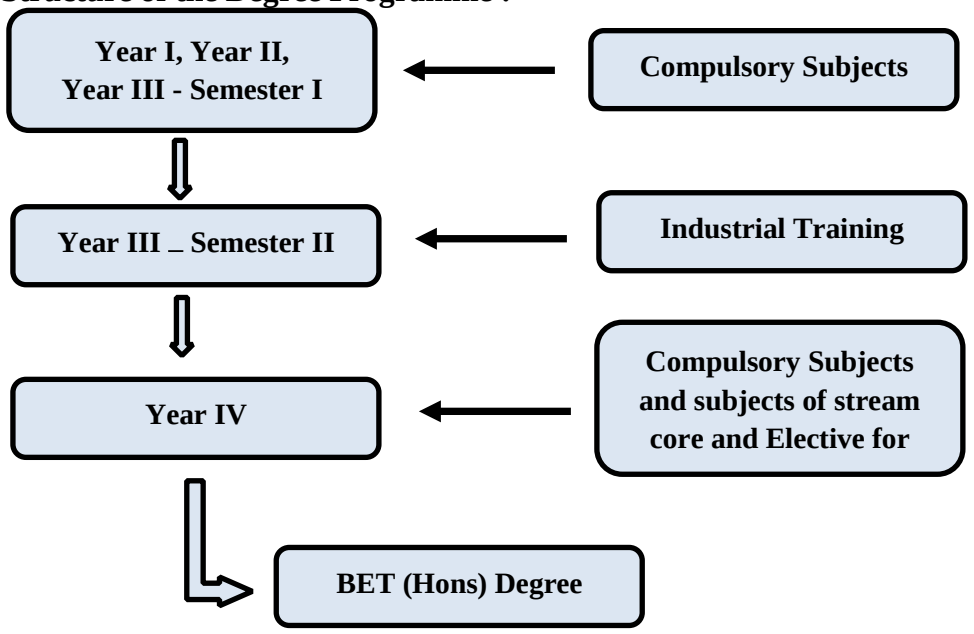
1. **Title of the Degree :** Bachelor of Engineering Technology Honours (BET Hons)
2. **Time duration :** 4-years
3. **Number of Credits :** 120
4. **SLQF Level :** 6
5. **Medium of Instruction :** English
6. **Student Intake :** 75 x 4 years = 300
7. **Department :** Department of Engineering Technology
8. **Name of the Faculty :** Faculty of Technology

9. **Name of the University :** Sabaragamuwa University of Sri Lanka

10. **Qualifications to Follow Degree Programme:** Candidates who have passed G.C.E Advanced Level (A/L) following subjects Science for Technology and Engineering Technology are eligible to follow the degree programme.

11. **Salient Features of the Degree Programme:** It is intended to deliver a globally recognized, objective-based, student-centered, industry-oriented degree programme that will produce professionals with abilities for creativity, innovation, product development and with entrepreneurial skills suited for careers in the industrial market in Engineering technology. The areas covered in the core programme include Basic science modules, Mathematics and Computing modules, Communication modules, Technology modules, Design and Manufacturing modules and Management and other disciplinary areas.

Structure of the Degree Programme :



COURSE AND CREDIT DISTRIBUTION

Department of Engineering Technology

Course Code Abbreviation	**:** ET – Engineering Technology
Fist Digit	**:** Year
Second Digit	**:** Semester
Third and fourth Digit	**:** Course Number of the Given Semester
Last Digit	**:** Number of Credit of the Course

All the courses offered in Year I and Year II are compulsory

Prerequisites: Students who have 80% attendance in taught classes are eligible for final written examination of the course.

Continuous Assessment: There should be at least 2 evaluation components such as assignment, in-class, quiz, midterm examination, presentation, etc as specified in the curricular for each course as appropriate.

COURSE DESCRIPTION – Bachelor of Engineering Technology Honours (BET (Hons))

Numbers of Credits of the BET (Hons) Degree

Year	Semester I	Semester II	Total
Year I	18	18	36
Year II	18	18	36
Year III	17	06	23
Year IV	10	15	25
Total			**120**

Year I			
Semester I – A student must earn a minimum of 18 credits			
Course Code	**Course Title**	**No. of Credits**	**Compulsory/Optional**
ET 11013	**Engineering drawing and Computer Aided Drafting**	**3**	**Compulsory**
	This introductory module aims to provide the necessary knowledge about, drawing standards, and symbols, and the ability to read and interpret mechanical engineering drawings and to develop skills in preparing engineering drawings adhering to international standards including the use of Computer Aided Drafting software for the preparation of drawings.		
ET 11023	**Workshop Technology and Practice**	**3**	**Compulsory**
	This module provide the necessary knowledge for identifying the applications of various workshop tools, machinery and operations, and their applications, limitations and to acquire the skills in carrying out basic machining processes and other workshop operations including welding while following safety practices.		
ET 11032	**Mathematics I**	**2**	**Compulsory**
	This course targets to provide an understanding of fundamentals of mathematics and to develop skills in mathematical problem solving needed in the field of engineering technology by developing an understanding of the applications of the methods of matrices and determinants, differentiation and integration		
ET 11043	**Physics for Technology**	**3**	**Compulsory**
	This is an introductory module to introduce fundamentals of physics for modelling and analysis of physical systems in terms of their mechanical and thermal behaviour		
ET 11053	**Chemistry for Technology**	**3**	**Compulsory**
	The aim is to introduce basic chemistry as applied in industrial processes for understanding, interpreting and optimizing industrial processes and systems involving chemical phenomena.		

ET 11062	**Computer Fundamentals and PC Applications**	**2**	**Compulsory**
	This module aims is to provide basic knowledge of computer architecture, operating Systems, networks, application software and develop skills for the use of computers.		
ET 11072	**English**	**2**	**Compulsory**
	The module aim is to facilitate the undergraduates in their academic work, by making the students confident in using the language appropriately, accurately and fluently in any given situation.		
ET 11080	**Creative Mini-project**	**0**	**Compulsory**
	This module develop the necessary knowledge and skills in analysing problems and situations and providing solutions by making decisions based on technological, scientific and logical approaches.		
	Total credits	**18**	

Semester II – A student must earn a minimum of 18 credits			
ET 12013	**Fundamentals of Thermodynamics**	**3**	**Compulsory**
	This module provides an understanding of fundamental laws governing the 6ehavior of thermodynamic systems, the relevant mathematical relationships and ability to apply them to simple thermodynamic systems and covers system definition, the first and second laws of thermodynamics, heat engine cycles, the measurement of engine performance and the combustion analysis of fuel.		
ET 12023	**Applied Mechanics**	**3**	**Compulsory**
	This module gives an understanding of fundamental laws governing the behavior of mechanical systems, the relevant mathematical relationships and ability to apply them to simple mechanical systems.		
ET 12033	**Applied Electricity**	**3**	**Compulsory**
	This module targets to provide an understanding of fundamental laws governing electrical systems, and the ability to apply them to solve problems involving simple electrical systems.		
ET 12043	**Properties and Strength of Materials**	**3**	**Compulsory**
	This module will provide knowledge about physical properties of common materials and their applications in engineering and to broaden and deepen the learner's knowledge of the principles and techniques used in stress analysis and be able to determine the stresses and strains induced in simple shaped components when subjected to loads in various forms.		
ET 12052	**Mathematics 2**	**2**	**Compulsory**
	This module aims to provide an understanding of fundamentals of mathematics and to develop skills in mathematical problem solving needed in the field of engineering technology by developing an understanding of basic concepts, methods and techniques of complex numbers and ordinary differential equations, and trigonometry with the ability to apply them for solving simple problems in Engineering Technology.		
ET 12062	**Computer Programming Techniques**	**2**	**Compulsory**
	The module aim is to develop basic practical skills in computer programming including control Structures, functions, pointers and arrays and file handling.		
ET 12072	**Communication Skills**	**2**	**Compulsory**

	The course also aims to address the academic communication needs of students studying in the technology discipline.		
	Total credits	**18**	

Year II			
Semester I – A student must earn a minimum of 18 credits			
ET 21012	**Automobile Technology**	**2**	**Compulsory**
	This module aims to analyse motor vehicle as a collection of integrated systems and determine the design requirements, construction methods and performance characteristics of its sub systems including electrical and electronic systems.		
ET 21023	**Design of Machine elements**	**3**	**Compulsory**
	This module will introduce standard design procedure of common machine elements including selection of material, standard components and other aspects needed for design and manufacture.		
ET 21033	**Manufacturing Processes 1**	**3**	**Compulsory**
	The module aim is to identify and assess the capability of basic manufacturing processes for meeting product specifications, select and sequence machinery, tooling and accessories required for manufacturing simple products.		
ET 21043	**Probability and Statistics**	**3**	**Compulsory**
	The module target to provide a broad knowledge of the fundamentals of probability and statistics and develop skills in the application of statistical techniques and analyses required in the field of engineering technology such as parameter estimations, hypothesis testing, design of statistical experiments, analysis of variance, and analysis of count data using statistical software.		
ET 21053	**Applied Electronics**	**3**	**Compulsory**
	This module will provide the necessary knowledge and skills in the application of concepts of Electronics for the design, analysis and application of electronic instruments and systems including applications for data acquisition and storage.		
ET 21062	**Professional Communication**	**2**	**Compulsory**
	The course also aims to address the academic and professional communication needs of technologists in industry.		
ET 21072	**Industrial Metrology**	**2**	**Compulsory**
	The module aim is to introduce fundamentals, instruments and methods of measurement and calibration used for industrial metrology		
	Total Credits	**18**	

Semester II – A student must earn a minimum of 18 credits			
ET 22011	**Field Studies**	**1**	**Compulsory**
	The module aim is to provide a preliminary exposure to the student to the world of work in order to create an opportunity to analyse the operations of a small or medium scale work place based on its technology applications, entrepreneurship and management which exposure at an early stage will equip and inspire the student to diligently engage in related studies.		

ET 22023	**Computer Aided Design**	**3**	**Compulsory**
	This module aims to introduce the students to the basic concepts, mathematical formulation and general procedure of the finite element method (FEM) as related to solving engineering problems involving solid modelling using commercial software for design.		
ET 22033	**Manufacturing Processes 2**	**3**	**Compulsory**
	The module aim is to identify and assess the capability of basic manufacturing processes for meeting product specifications, select and sequence machinery, tooling and accessories required for manufacturing simple products.		
ET 22043	**Mechanical Power Transmission**	**3**	**Compulsory**
	To module will introduce design procedure of common components used in mechanical power transmission including selection of material, kinematics and kinetic aspects needed for selection and design.		
ET 22053	**Thermodynamics**	**3**	**Compulsory**
	The module will provide necessary knowledge needed for thermodynamic analysis and the design of thermodynamic machinery and systems and skills required for their operation and maintenance.		
ET 22063	**Fluid Mechanics**	**3**	**Compulsory**
	The module aims to provide the necessary knowledge on principles of fluid mechanics and their applications in fluid power engineering including knowledge about construction, operation and performance of hydraulic and turbo machinery and ability to design and construct industrial hydraulic systems following relevant standards and to maintain fluid machinery and systems.		
ET 22072	**Computational and Numerical Mathematics**	**2**	**Compulsory**
	The aim of this module is to enable the student to use mathematical software as a convenient tool for solving a range of problems in engineering technology by the application of numerical methods of mathematics.		
	Total credits	**18**	

Year III			
Semester I – A student must earn a minimum of 17 credits			
ET 31013	**Electrical Machines**	**3**	**Compulsory**
	The module aims to provide the necessary knowledge and skill to maintain electrical equipment, machinery and systems in an industrial environment.		
ET 31024	**Machine Design**	**4**	**Compulsory**
	The aim is to provide the student with competencies required for converting a product requirement to a design specification for developing a prototype and testing it as an industrial design.		
ET 31033	**Automotive Electronics**	**3**	**Compulsory**

	This module target to provide necessary knowledge and skills for troubleshooting and maintenance of modern vehicles utilising appropriate equipment. It covers the technical needs for today's motor vehicle repair industry, including the diagnosis of complex system faults. It includes Faults and Symptoms in Engine Management Systems; Diagnosis of Faults in Electronic Ignition, Petrol and Diesel Injection and Engine Management Systems; Diagnosis of Faults in Vehicle Comfort Systems, Emission testing and regulations.		
ET 31042	**Optimization Methods**	**2**	**Compulsory**
	This module aims at providing an in depth knowledge of the methods of mathematical optimization, their applications and the use of computational methods for solving optimization problems in engineering technology and management.		
ET 31051	**Occupational Health and safety**	**1**	**Compulsory**
	The module aim is to create and awareness and ability to analysis a work environments based on the principles and legislature for Occupational Health and Safety (OHS) at a work place for making improvements when necessary.		
ET 31062	**Industrial Economics and Accounting**	**2**	**Compulsory**
	The module aim is to provide the technologist with a knowledge of the business economic environment and roles of functional management for participating in the management of a business oragnisation.		
ET 31072	**Introduction to Nano Materials**	**2**	**Compulsory**
	The objective of this module is to introduce concepts and experimental methods in major developments of nanotechnology and nanomaterials, including synthesis, fabrication, characterization and applications		
	Total credits	**17**	

Semester II – A student must earn a minimum of 6 credits			
ET 32016	**Industrial training**	**6**	**Compulsory**
	Total credits	**6**	

Year IV			
Semester I – A student must earn a minimum of 10 credits			
ET 41016	**Integrative Product Design and Research Project**	**6**	**Compulsory**
	The module aim is to develop competencies for performing design, fabrication, installation and testing of simple but industry scale integrated prototypes/systems of a mechanical nature for commercialization.		
ET 41023	**Control systems**	**3**	**Compulsory**
	The module will provide the competence required to design and develop control systems for industry requirements following standard practices utilizing commercially available components and to conduct maintenance of such control systems.		
ET 41033	**Computer-integrated Manufacturing**	**3**	**Core Elective**

	The module aim is to introduce fundamentals of computer integration in industry for the selection, integration, implementation and use of computer-aided design and manufacturing methods in industry.		
ET41043	**Building Services**	**3**	**Core Elective**
	The module is to provide the competence required to operate and maintain essential services for buildings that employ latest technologies and ensure efficient operation of such buildings.		
ET41052	**Production Management**	**2**	**Compulsory**
	The module aim is to provide the student with the competencies required for managing operations in a production system by enabling to manage the activities of system design, planning, operation and performance improvement.		
ET41061	**Environment Management**	**1**	**Compulsory**
	This module aims to create an awareness of sources and impacts of the physical and chemical pollution involved, make environmental assessments and develop strategies to prevent & minimize the pollution and waste in industry based on regulations and standards.		
ET41072	**Modern Automobile Technology**	**2**	**Optional**
	The module is provide an in depth understanding of current technology of motor vehicles and skills to trouble shoot and maintain them while providing an insight into the latest and future technology of motor vehicles		
ET41081	**Humanities Module 1**	**1**	**Compulsory**
	The module is to provide the competence required to operate and maintain essential services for buildings that employ latest technologies and ensure efficient operation of such buildings.		
	Total credits	**10**	

Semester II – A student must earn a minimum of 15 credits			
ET 41016	**Integrative Product Design and Research**	**6**	**Compulsory**
	Project (cond.)		
	The module aim is to develop competencies for performing design, fabrication, installation and testing of simple but industry scale integrated prototypes/systems of a mechanical nature for commercialization.		
ET42011	**Professional Practices**	**1**	**Compulsory**
	The module aim is to provide the student with the competencies required for fulfilling managerial, ethical, legal, and professional obligations necessary to function effectively in a contemporary business environment while dealing with socially, economically and culturally diverse environments.		
ET42022	**Industrial Management**	**2**	**Compulsory**
	The aim is to equip the student with a knowledge of the principles of managing human resource, marketing and technology in a business organization.		
ET42031	**Entrepreneurship Development**	**1**	**Compulsory**

	The aim is to create entrepreneurial interest and attitudes in the student and provide them with skills for developing, evaluating and presenting business plans.		
ET42043	**Industrial Installations**	**3**	**Core Elective**
	The module aim is to provide the competence required to operate and maintain services efficiently including the ability to design and carryout allowable modifications / improvements to existing systems in an industrial setting.		
ET42053	**Industrial Automation and Robotics**	**3**	**Core Elective**
	The module aim is to introduce the scope, techniques of analysis and use of automated systems and robots in industry		
ET42061	**Project Management**	1	**Compulsory**
	The aim is to provide necessary competencies for planning, organizing and evaluating industrial project proposals and managing projects in a systematic and gainful manner.		
ET42071	**Humanities Module 2**	**1**	**Compulsory**
	Total credits	**15**	