



UNIVERSITY
of
TECHNOLOGY,
MAURITIUS

School of Innovative Technologies and Engineering

Department of Industrial Systems Engineering

BEng (Hons) Telecommunication Engineering

PROGRAMME DOCUMENT

VERSION 2.0
BTEL V2.0
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BENG (HONS) TELECOMMUNICATION ENGINEERING

A. PROGRAMME INFORMATION

This programme is designed to integrate telecommunication systems with computer technology so that graduates can take up demanding, responsible and exciting positions in the rapidly expanding telecommunication industries. The programme has been developed in consultation with leading telecommunications companies in Mauritius and is tailored to the current needs of the industry. Armed with this qualification, graduates will have sound knowledge of programming techniques, telecommunication and network technologies, digital and analogue technologies, legal issues, and standards used. Graduates will also have the necessary skills to develop a concept through the design and computer modeling stages.

The growth of telecommunications over the last ten years has been phenomenal and this expansion is set to continue for several decades. Computer networks, radio links and optical fibre systems are all being developed and now form the basis for global communications. The internet is the largest technological machine in the world with an enabling capability which affects us all, ranging from email, worldwide access to information and distributed computing, to electronic marketing and commerce.

At the first level, the programme covers a broad range of fundamental concepts in telecommunication and electronics, applied mathematics, of materials science and engineering, and of programming topics, and lays the theoretical and practical foundations for study at a more advanced level.

In the second and third levels the modules are built to give the students an understanding of how to apply basic principles to more complex problems and helping them to develop sophisticated analysis methods and design. Hence, the work becomes more specialised with core modules such as Switching Techniques, Antenna and Radio Wave Propagation, Wireless Communications, Mobile Communication Engineering, Microwave Engineering, IP Telephony, Digital Signal Processing, RF Systems and Design and Telecommunications Standards

The last level deals with elective modules such as VLSI design and Technology, Satellite Communication systems and Optical fibre Communication systems. These modules deal with the details of how and why telecommunication systems work. Moreover, in the last level, students will be attached to industries for one full semester so that they can apply their theoretical knowledge to solve real-world problems in Telecommunication and Electronic Engineering. The student will have to complete a final year project to be qualified for the BEng programme.

APPROVAL OF CURRICULUM

The BEng (Hons) Telecommunication Engineering programme meets the academic requirements set by the **Council of Registered Professional Engineers (CRPE)** of Mauritius.

B. PROGRAMME AIMS

The BEng (Hons) Telecommunication Engineering programme aims to provide a foundation upon which you can build a successful career. This programme has been created to provide you with the skills and abilities required by telecommunications companies. The programme deals with telecommunications engineering as well as electronics.

Employment Prospects

There are many and varied career opportunities for highly qualified engineers in the telecommunications industry. These industries are large and strong in Mauritius and in the region. Also, due to the global nature of telecommunications, there are also career opportunities in other parts of the World. This programme has much in common with an undergraduate programme in Electronic and related, meaning graduates have a great deal of flexibility and could easily apply for posts in telecommunications companies as well as electronics companies. As well as more general management and applications opportunities, possible employment areas include Telecommunications engineering, Mobile network field staff, Telecommunications network support staff, Technical management, Network planning and implementation, Network management and Research and development.

In addition, there are openings in education, in both teaching and research. The solid base that the programme provides can lead to research work either through an MEng programme or to study for a PhD.

C. PROGRAMME OBJECTIVES

After successful completion of the BEng programme, the graduates should

- achieve the knowledge and understanding of mathematical and scientific principles to underpin their education in telecommunication engineering and to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems;
- achieve the understanding of engineering principles and the ability to apply them to analyse key engineering processes;
- develop the ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modeling techniques;
- develop the ability to apply quantitative methods and computer software in order to solve engineering problems;
- be able to create and develop economically viable products, processes or systems to meet a defined need;
- acquire knowledge of management techniques which may be used to achieve engineering objectives;
- acquire knowledge of relevant legal requirements governing engineering activities, including personnel, health, safety and risk;
- achieve the understanding of the need for a high level of professional and ethical conduct in engineering;
- be able to apply their engineering skills, combining theory and experience, and to use other relevant knowledge and skills which include knowledge of characteristics of particular materials, equipment, processes, or products, workshop and laboratory skills, knowledge of quality issues, knowledge of codes of practice and industry standards, ability to work with technical uncertainty etc.

PART I REGULATIONS

D. GENERAL ENTRY REQUIREMENTS

As per UTM'S Admission Regulations, and 'Admission to Programmes of Study at First Degree Level'.

E. PROGRAMME ENTRY REQUIREMENTS

Pass at Principal Level in Mathematics AND Physics at HSC/GCE A-Level or equivalent, or Baccalaureate Level.

Note:

As per the recommendation of CRPE of Mauritius, the Brevet de Technicien (Scientifique) or any other higher technical qualifications are no longer admissible in lieu of the requirements above.

F. PROGRAMME MODE AND DURATION

Full Time: Minimum 4 years (8 semesters) and Maximum 7 years (14 semesters)

G. TEACHING AND LEARNING STRATEGIES

Teaching and learning activities may include

- Lectures (L), Tutorials (T) and Practical (P) sessions
- Class Tests and Assignments
- Participating in quiz-based exercises
- Professional Work Placement (in-house training and outside the University)
- Workshops / Seminars / Lab Sessions
- Industry visits so that students may observe company cultures and may network with industry professionals
- Structured Discussions & Self Development Study (SD)
- Case Study materials & scenarios centred on real-world problems.

H. STUDENT SUPPORT AND GUIDANCE

- Academic tutoring and Counseling: Group tutorials or individual tutorials are arranged for students upon request.
- Supervision of mini-projects, placement, and final year projects.

I. ATTENDANCE REQUIREMENTS

As per UTM's Regulations and Policy.

J. CREDIT SYSTEM

This programme is aligned with the European Credit and Transfer System (ECTS). The programme promotes a unified procedure for academic recognition of study periods performed. The system introduces standards for assessment and comparison of study levels in various academic institutions and enables to recognition of diplomas at the European job market.

One module is worth 6 credits and will carry 150 hours of learning to comprise 45 hours of delivery which could be any combination of face-to-face, blended, online, seminar, workshop, or joint session. The remaining 105 hours will cover self-learning, self-study, guest lecture, etc. The final year project is assigned 12 credits.

K. STUDENT PROGRESS AND ASSESSMENT

The programme is delivered through lectures and seminars, and computer/practical sessions in computer & engineering labs. Self-study or self-development is also important and will include reading, designing and preparing presentations, academic tutoring, writing reports and theses, and investigating problems.

The importance of IT/simulation tools in modern telecommunication engineering practice is emphasized, and students will make use of the latest software to solve mathematical, control and signal-processing problems and to prepare electronic and systems designs.

For the award of the degree, all modules must be passed overall with passes in the examinations, coursework, and other forms of assessment. All modules will carry 100 marks and will be assessed as follows (unless otherwise specified):

- (i) Written examinations and/or practical examinations will normally carry a weightage of 60% unless otherwise specified.
- (ii) Continuous assessment will normally carry a weightage of 40% unless otherwise specified.
- (iii) Continuous assessment for the specific modules 'Communication workshop' and 'Research methodology' shall be 100% of the total marks. Continuous assessment can be based on a combination of assignments, field studies, workshops, and class tests.
- (iv) The overall pass mark for a module is 40%.

Grading

Grade	Marks x(%)
A	$x \geq 70$
B	$60 \leq x < 70$
C	$50 \leq x < 60$
D	$40 \leq x < 50$
F	$x < 40$
A - D	Pass
F	Referred

L. EVALUATION OF PERFORMANCE

- (i) The % mark at Level 1 contributes a 20% weighting towards the degree classification.
- (ii) The % mark at Level 2 contributes a 20% weighting towards the degree classification.
- (iii) The % mark at Level 3 contributes a 30% weighting towards the degree classification.
- (iv) The % mark at Level 4 contributes a 30% weighting towards the degree classification.

M. AWARD CLASSIFICATION

Overall weighted mark y (%)

$y \geq 70$
$60 \leq y < 70$
$50 \leq y < 60$
$45 \leq y < 50$
$40 \leq y < 45$
$y < 40$

Classification

1st Class Honours
2 nd Class 1st Division Honours
2 nd Class 2 nd Division Honours
3rd Class Honours
Pass Degree
No Award

For the award of an Honours Degree, a total of 252 credits is required.

Students who fail to qualify for the award of the degree may be awarded as follows:

1. Certificate in Telecommunication Engineering: a minimum of 72 credits
2. Diploma in Telecommunication Engineering: a minimum of 144 credits.

N. PROGRAMME ORGANISATION AND MANAGEMENT

Programme Director/Coordinator: Dr. Vinaye ARMOOGUM

Contact Details: Tel: 207-5250 Fax: 234-1767

Email: varmoogum@umail.utm.ac.mu

O. PROGRAMME STRUCTURE (Full-Time)

BENG (HONS) TELECOMMUNICATION ENGINEERING

YEAR 1 (Level 1)							
<i>Semester 1</i>				<i>Semester 2</i>			
Code	Modules	Hrs/Wk L/T/P+S D	ECTS Credits	Code	Modules	Hrs/Wk L T/P SD	ECTS Credits
TELC1101	Communications Systems Fundamentals	3+7	6	ELEC1102	Analogue Electronics	3+7	6
ASE1101	Principles of Engineering	3+7	6	ASE1102	Materials Science and Engineering	3+7	6
PROG1114	Programming for Engineers	3+7	6	PROG1114	Programming for Engineers	3+7	6
MATH1145	Foundation Mathematics	3+7	6	HCA1109	Computer and Microprocessor Architecture and Programming	3+7	6
ITE1104	Legal Issues & Professional Ethics for Engineers	3+7	6	TELC1102	Communications and Networks	3+7	6
COMM1106	Communication Workshop	3+7	6	MATH1146	Numbers, Logics and Graphs Theories	3+7	6

YEAR 2 (Level 2)							
<i>Semester 1</i>				<i>Semester 2</i>			
Code	Modules	Hrs/Wk L/T/P+S D	ECTS Credits	Code	Modules	Hrs/Wk L/T/P+SD	ECTS Credits
ASE2101	Health, Safety and Risk in Engineering	3+7	6	CAN2113	Switching Techniques	3+7	6
ELEC2103	Digital Electronics	3+7	6	TELC2104	Antennas and Radio Wave Propagation	3+7	6
OSS2108	Network Operating System	3+7	6	ASE2103	Electromagnetic theory	3+7	6
TELC2103	Wireless Communications	3+7	6	TELC2103	Wireless Communications	3+7	6
SCG2123	Digital Signal Processing	3+7	6	SCG2123	Digital Signal Processing	3+7	6
MATH2147	Engineering Mathematics	3+7	6	MATH2148	Advanced Engineering Mathematics	3+7	6

YEAR 3 (Level 3)

<i>Semester 1</i>				<i>Semester 2</i>			
Code	Modules	Hrs/Wk L/T/P+SD	ECTS Credits	Code	Modules	Hrs/Wk L/T/P+SD	ECTS Credits
TELC3111	RF Systems and Design	3+7	6	ASE3101	Research Methodology	3+7	6
TELC3106	Microwave Engineering	3+7	6	TELC3106	Microwave Engineering	3+7	6
HCA3110	Embedded Systems and Design	3+7	6	HCA3110	Embedded Systems and Design	3+7	6
TELC3107	IP Telephony	3+7	6	TELC3109	Telecommunications standards, regulation and legislation	3+7	6
TELC3108	Mobile Communication Engineering	3+7	6	TELC3110	Electromagnetic Compatibility	3+7	6
MATH3149	Scientific Computing	3+7	6	SEM3107	Project Management for Engineers	3+7	6

YEAR 4 (Level 4)

<i>Semester 1</i>				<i>Semester 2</i>			
Code	Modules	Hrs/Wk L/T/P+SD	ECTS Credits	Code	Modules	Hrs/Wk L/T/P+SD	ECTS Credits
PROJ4201	Professional Placement	-	6		Elective 1	3+7	6
SECU4114	Security in Telecommunications	3+7	6		Elective 2	3+7	6
PROJ4112	Telecom Project		-	PROJ4112	Telecom Project		12

Electives

Code	Modules	Hrs/Wk L/T/P+SD	ECTS Credits
ELEC4104	VLSI Design and Technology	3+7	6
TELC4111	Satellite communication systems	3+7	6
TELC4112	Optical fibre communication systems	3+7	6
SEM4107	Quality assurance and management principles	3+7	6
TELC4113	Broadband Communications	3+7	6
TELC4117	Networking Design, Management and Modeling	3+7	6
TELC4114	Radio/Television Broadcasting Technology	3+7	6
TELC4115	Telecommunication and Networking In Business	3+7	6
TELC4116	Cloud Systems Engineering	3+7	6

Total Number of ECTS Credits = 252.

Total Number of ECTS Hours = 5850 (excluding the number of hours spent to complete the one-semester Professional Placement and the Final Year project).

Version 2.0 was approved in September 2021.