

IIE Bachelor of Engineering in Electrical and Electronic Engineering

School of Engineering, Science and Health

Unlike traditional engineering programmes, this programme will expose you to the role of engineering in the real world as early as the first year of the programme. Our programme ensures that you are equipped with first-hand experience of the value that engineering adds to improving the quality of lives in communities.

The shortage of skilled engineers has a widespread effect on South Africa and the African continent at large, affecting the country's functioning in the globalised business environment and economy. Upon graduating with this degree, your skills will be in high demand,

making you sought after by potential employers.

This programme is available in two streams; namely the four-year mainstream programme and the five-year extended programme. The purpose of the extended programme is to offer students the opportunity to complete the first two years of the mainstream programme over a period of three years. The credit allocation for the first two years of the programme will therefore be spread over three years and allow the student to make a smooth transition into tertiary education.

DEGREE

CONTACT

FULL-TIME

Curriculum (Mainstream Programme)

| MODULES | | | | | |
|----------|------------------------------------|---------|----------|--|---------|
| YEAR 1 | | | | | |
| Code | Module Name | Credits | Code | Module Name | Credits |
| BCPH5111 | Basic Concepts in Physics | 12 | ADMC5112 | Advanced Mathematical Concepts | 12 |
| BMCO5111 | Basic Mathematical Concepts | 12 | BEOP5112 | Basics of Electrical and Optical Physics | 12 |
| COEM5111 | Chemistry of Engineering Materials | 12 | CREN5112 | Chemical Reactions in Engineering | 12 |
| EDGR5111 | Engineering Design Graphics | 16 | MEIF5112 | Mechanics: The Interaction of Forces | 12 |
| BACA5111 | Basic Accounting and Analysis | 12 | FNAC5112 | Financial Accounting | 12 |
| INCT5111 | Innovation & Creative Thinking | 8 | MACP5112 | Multidisciplinary Applied Community Projects | 16 |
| JAEN5111 | Java for Engineers | 8 | | | |

| YEAR 2 | | | | | |
|----------|--|---------|----------|---|---------|
| Code | Module Name | Credits | Code | Module Name | Credits |
| EEFU6211 | Electrical Engineering Fundamentals | 12 | ADIC6212 | Advanced Differential and Integral Calculus | 12 |
| ICAL6211 | Differential and Integral Calculus | 14 | SMLC6212 | Strength of Materials under Simple Loading Conditions | 12 |
| BAEL6211 | Basic Analogue Electronics | 12 | DIEL6212 | Digital Electronics | 8 |
| CFEN6211 | C Plus Plus for Engineers | 8 | EDMS6212 | Economic Decision Making for Sustainability | 12 |
| ELTH6211 | Electromagnetic Theory | 8 | MFFS6212 | Mechanics of Fluid Flow Systems | 8 |
| FMEN6211 | Financial Management for Engineers | 12 | SPPD6212 | Sociological Perspectives of Development | 12 |
| FPMD6211 | Fundamental Principles in Machine Dynamics | 12 | TPOF6212 | Thermodynamic Properties of Fluids | 8 |

| YEAR 3 | | | | | |
|----------|--|---------|----------|-------------------------------|---------|
| Code | Module Name | Credits | Code | Module Name | Credits |
| AANE7311 | Advanced Analogue Electronics | 12 | CODE7312 | Communication for Development | 12 |
| DISY7311 | Digital Systems | 12 | DESP7312 | Design Project | 12 |
| INME7311 | Instrumentation and Measurement | 12 | EMBS7312 | Embedded Systems | 12 |
| NUME7311 | Numerical Methods | 12 | POEL7312 | Power Electronics | 8 |
| POWS7311 | Power Systems | 12 | SIPR7312 | Signal Processing | 12 |
| SEPP7311 | Software Engineering Principles & Practice | 8 | STAM7312 | Statistical Methods | 8 |
| SISY7311 | Signals & Systems | 8 | TELS7312 | Telecommunication Systems | 12 |

| YEAR 4 | | | | | |
|-----------|---------------------------------------|---------|----------|-------------------------------------|---------|
| Code | Module Name | Credits | Code | Module Name | Credits |
| CSAU8411 | Control Systems & Automation | 12 | HVEN8411 | High Voltage Engineering (Elective) | 8 |
| PGRE8411 | Power Generation and Renewable Energy | 16 | IMGP8411 | Image Processing (Elective) | 8 |
| ENEN8411 | Entrepreneurship for Engineering | 12 | DACM8411 | Data Communications (Elective) | 8 |
| PRMB8411 | Project Management | 8 | CONE8411 | Computer Networks (Elective) | 8 |
| ADSY84111 | Advanced Power Systems (Elective) | 8 | DEPR8412 | Design Project | 36 |
| ELMA8411 | Electrical Machines (Elective) | 8 | REPO8412 | Research Project | 36 |

Curriculum (Extended Programme)

| MODULES | | | | | |
|-----------|--|---------|----------|---|---------|
| YEAR 1 | | | | | |
| Code | Module Name | Credits | Code | Module Name | Credits |
| BCPH5111 | Basic Concepts in Physics | 12 | ADMC5112 | Advanced Mathematical Concepts | 12 |
| BMCO5111 | Basic Mathematical Concepts | 12 | BEOP5112 | Basics of Electrical and Optical Physics | 12 |
| COEM5111 | Chemistry of Engineering Materials | 12 | CREN5112 | Chemical Reactions in Engineering | 12 |
| EDGR5111 | Engineering Design Graphics | 16 | MEIF5112 | Mechanics: The Interaction of Forces | 12 |
| YEAR 2 | | | | | |
| Code | Module Name | Credits | Code | Module Name | Credits |
| JAEN5111 | Java for Engineers | 8 | ADIC6212 | Advanced Differential and Integral Calculus | 12 |
| INCT5111 | Innovation & Creative Thinking | 8 | SMLC6212 | Strength of Materials under Simple Loading Conditions | 12 |
| BACA5111 | Basic Accounting and Analysis | 12 | FNAC5112 | Financial Accounting | 12 |
| EEFU6211 | Electrical Engineering Fundamentals | 16 | MACP5112 | Multidisciplinary Applied Community Projects | 16 |
| ICAL6211 | Differential and Integral Calculus | 12 | | | |
| YEAR 3 | | | | | |
| Code | Module Name | Credits | Code | Module Name | Credits |
| CFEN6211 | C Plus Plus for Engineers | 8 | MFFS6212 | Mechanics of Fluid Flow Systems | 8 |
| BAEL6211 | Basic Analogue Electronics | 12 | SPPD6212 | Sociological Perspectives of Development | 12 |
| FMEN6211 | Financial Management for Engineers | 12 | TPOF6212 | Thermodynamic Properties of Fluids | 8 |
| FPMD6211 | Fundamental Principles in Machine Dynamics | 12 | DIEL6212 | Digital Electronics | 8 |
| ELTH6211 | Electromagnetic Theory | 8 | EDMS6212 | Economic Decision Making for Sustainability | 12 |
| YEAR 4 | | | | | |
| Code | Module Name | Credits | Code | Module Name | Credits |
| AANE7311 | Advanced Analogue Electronics | 12 | CODE7312 | Communication for Development | 12 |
| DISY7311 | Digital Systems | 12 | DESP7312 | Design Project | 12 |
| INME7311 | Instrumentation and Measurement | 12 | EMBS7312 | Embedded Systems | 12 |
| NUME7311 | Numerical Methods | 12 | POEL7312 | Power Electronics | 8 |
| POWS7311 | Power Systems | 12 | SIPR7312 | Signal Processing | 12 |
| SEPP7311 | Software Engineering Principles & Practice | 8 | STAM7312 | Statistical Methods | 8 |
| SISY7311 | Signals & Systems | 8 | TELS7312 | Telecommunication Systems | 12 |
| YEAR 5 | | | | | |
| Code | Module Name | Credits | Code | Module Name | Credits |
| CSAU8411 | Control Systems & Automation | 12 | HVEN8411 | High voltage Engineering (Elective) | 8 |
| PGRE8411 | Power Generation and Renewable Energy | 16 | IMGP8411 | Image Processing (Elective) | 8 |
| ENEN8411 | Entrepreneurship for Engineering | 12 | DACM8411 | Data Communications (Elective) | 8 |
| PRMB8411 | Project Management | 8 | CONE8411 | Computer Networks (Elective) | 8 |
| ADSY84111 | Advanced Power Systems (Elective) | 8 | DEPR8412 | Design Project | 36 |
| ELMA8411 | Electrical Machines (Elective) | 8 | REPO8412 | Research Project | 36 |

IIE Bachelor of Engineering in Electrical and Electronic Engineering

4 OR 5 YEARS FULL-TIME | NQF LEVEL 8 | MINIMUM 480 Credits | SAQA ID: 101433

Career Opportunities

This programme prepares graduates to assume engineering positions within private consultation firms, development laboratories and large and small private enterprises involved with the design, development, production, and marketing of Electrical and Electronic systems, subsystems and components of products. Graduates may also choose to pursue a career in the finance, insurance or banking industries as well as academia, either as a discipline-specific lecturer or researcher.

NQF 5 Higher Certificate

NQF 7 Bachelor's Degree (360 credits)

NQF 8 Bachelor's Degree (480 credits) ✓

NQF 9 Master's Degree



Admission Requirements

There are prerequisites for this programme that must be met in order to progress through the qualification.

Minimum Admission Requirements: 4-year programme

National Senior Certificate (NSC)

Bachelor pass with English 50%, Mathematics 70% and Physical Science 60%

National Certificate (Vocational) (NC(V))

Bachelor pass with English 50% (3), Mathematics 70% and Physical Science 60%

Senior Certificate SC: Endorsement with

Bachelor pass with English 50%, Mathematics 70% and Physical Science 60%

Senior Certificate (Amended) (SC(a))

Bachelor pass with English 50%, Mathematics 70% and Physical Science 60%

International

An USAf Exemption Certificate with 70% or equivalent for Maths AND 50% or equivalent for English AND 60% or equivalent is also required for either Physical Science or both Physics and Chemistry.

A cognate Higher Certificate OR any cognate 240 credit Diploma OR an Advanced Certificate OR 360 credit Diploma OR an appropriate IIE MSA Foundation Programme may satisfy the minimum admission requirements to degree studies.

NOTE: A student may not proceed to the next year if all the stipulated pre- and co-requisites have not been satisfied because he/she will require these requisites to be able to undertake the level of study required in the next year.

Minimum Admission Requirements: 5-year programme

National Senior Certificate (NSC)

Bachelor pass with English 50%, Mathematics 60% and Physical Science 50%

National Certificate (Vocational) (NC(V))

Bachelor pass with English 50%, Mathematics 60% and Physical Science 50%

Senior Certificate (SC): Endorsement with

Endorsement with English 50%, Mathematics 60% and Physical Science 50%

Senior Certificate (Amended) (SC(a))

Bachelor pass with English 50%, Mathematics 60% and Physical Science 50%

International Requirements for 5-year programme

USAf Exemption Certificate with 60% or equivalent for Maths AND 50% or equivalent for English AND 50% or equivalent is also required for either Physical Science or both Physics and Chemistry.

SHAPE YOUR DEGREE. YOUR FUTURE. YOUR CAREER.