

# IIE Bachelor of Engineering in Mechanical Engineering

Faculty of Science & Technology

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.

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

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.

This professional degree is accredited by the Engineering Council of South Africa (ECSA).

**DEGREE**

**CONTACT**

**FULL-TIME**

# IIE Bachelor of Engineering in Mechanical Engineering

4 OR 5 YEARS FULL-TIME | NQF LEVEL 8 | MINIMUM 480 Credits | SAQA ID: 101732

## Curriculum

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
IPRE5111	Introduction to Programming for Engineers	8			
YEAR 2					
Code	Module Name	Credits	Code	Module Name	Credits
ICAL6211	Differential and Integral Calculus	12	SPPD6212	Sociological Perspectives of Development	12
ICSI6211	Introduction to Computer Simulations	8	TPOF6212	Thermodynamic Properties of Fluids	8
EEFU6211	Electrical Engineering Fundamentals	16	DIEL6212	Digital Electronics	8
BAEL6211	Basic Analogue Electronics	12	EDMS6212	Economic Decision Making for Sustainability	12
FPMD6211	Fundamental Principles in Machine Dynamics	12	SMLC6212	Strength of Materials under Simple Loading Conditions	12
ELTH6211	Electromagnetic Theory	8	MFFS6212	Mechanics of Fluid Flow Systems	8
FMEN6211	Financial Management for Engineers	12	ADIC6212	Advanced Differential and Integral Calculus	12
YEAR 3					
Code	Module Name	Credits	Code	Module Name	Credits
NUME7311	Numerical Methods	12	STAM7312	Statistical Methods	8
MSAP7311	Material Science and Properties	8	TMIA7312	Thermal Machinery for Industrial Application	12
AMFF7311	Advanced Mechanics of Fluid Flow Systems	12	MDES7312	Machine Dynamics for Engineering Systems	12
SMCL7311	Strength of Materials under Complex Loading Conditions	12	MTEC7312	Manufacturing Techniques	12
BCSD7311	Basic Concepts in Structural and Machine Design	12	ACMS7312	Advanced Concepts of Machine Systems Design	12
MEDP7311	Mechanical Design Project	8	MEMI7312	Mechanical Measurement and Instrumentation	8
SDHI7311	Software Design and Hardware Interfacing	8	CODE7312	Communication for Development	12
YEAR 4					
Code	Module Name	Credits	Code	Module Name	Credits
DBEF8411	Dynamic Behaviour of Fluids	12	POSY8411	Power Systems (Elective)	12
PGRE8411	Power Generation and Renewable Energy	16	MEVA8411	Mechanical Vibrations Analysis (Elective)	8
ENEN8411	Entrepreneurship for Engineering	12	MHTR8411	Mass and Heat Transfer (Elective)	8
PRMB8411	Project Management	8	RACO8411	Refrigeration and Air Conditioning (Elective)	8
CSAU8411	Control Systems & Automation (Elective)	12	DEPM8412	Design Project for Mechanical Engineering	36
MRMA8411	Maintenance and Reliability Management (Elective)	8	REPM8412	Research Project for Mechanical Engineering	36
			EGAM8412	Engineering Graduate Attribute Competence (Mechanical)	0

# IIE Bachelor of Engineering in Mechanical Engineering

4 OR 5 YEARS FULL-TIME | NQF LEVEL 8 | MINIMUM 480 Credits | SAQA ID: 101732

## 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
IPRE5111	Introduction to Programming 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
ICAL6211	Differential and Integral Calculus	12	MACP5112	Multidisciplinary Applied Community Projects	16
EEFU6211	Electrical Engineering Fundamentals	16			
YEAR 3					
Code	Module Name	Credits	Code	Module Name	Credits
ICSI6211	Introduction to Computer Simulations	8	SPPD6212	Sociological Perspectives of Development	12
BAEL6211	Basic Analogue Electronics	12	TPOF6212	Thermodynamic Properties of Fluids	8
FMEN6211	Financial Management for Engineers	12	DIEL6212	Digital Electronics	8
FPMD6211	Fundamental Principles in Machine Dynamics	12	EDMS6212	Economic Decision Making for Sustainability	12
ELTH6211	Electromagnetic Theory	8	MFFS6212	Mechanics of Fluid Flow Systems	8
YEAR 4					
Code	Module Name	Credits	Code	Module Name	Credits
NUME7311	Numerical Methods	12	STAM7312	Statistical Methods	8
MSAP7311	Material Science and Properties	8	TMIA7312	Thermal Machinery for Industrial Application	12
AMFF7311	Advanced Mechanics of Fluid Flow Systems	12	MDES7312	Machine Dynamics for Engineering Systems	12
SMCL7311	Strength of Materials under Complex Loading Conditions	12	MTEC7312	Manufacturing Techniques	12
BCSD7311	Basic Concepts in Structural and Machine Design	12	ACMS7312	Advanced Concepts of Machine Systems Design	12
MEDP7311	Mechanical Design Project	8	MEMI7312	Mechanical Measurement and Instrumentation	8
SDHI7311	Software Design and Hardware Interfacing	8	CODE7312	Communication for Development	12
YEAR 5					
Code	Module Name	Credits	Code	Module Name	Credits
DBEF8411	Dynamic Behaviour of Fluids	12	MEVA8411	Mechanical Vibrations Analysis (Elective)	8
PGRE8411	Power Generation and Renewable Energy	16	MHTR8411	Mass and Heat Transfer (Elective)	8
ENEN8411	Entrepreneurship for Engineering	12	RACO8411	Refrigeration and Air Conditioning (Elective)	8

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YEAR 5					
Code	Module Name	Credits	Code	Module Name	Credits
PRMB8411	Project Management	8	MRMA8411	Maintenance and Reliability Management (Elective)	8
CSAU8411	Control Systems & Automation (Elective)	12	DEPM8412	Design Project for Mechanical Engineering	36
POSY8411	Power Systems (Elective)	12	REPM8412	Research Project for Mechanical Engineering	36
			EGAM8412	Engineering Graduate Attribute Competence (Mechanical)	0

## Career Opportunities

The 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 Mechanical systems, subsystems and components of products. Graduates may also choose to pursue a career in 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%

**Alternate Admission** : English 40-49% If achieved 50% min in final Grade 11 results. (Should the English requirement not be met at NSC Grade 12, then entrance may be granted if the English requirement is met based in the final Grade 11 mark)

**National Certificate (Vocational) (NC(V))** Bachelor pass with English 50% (3), Mathematics 70% and Physical Science 60%

**SC: Endorsement 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%

**Alternate Admission** : English 40-49% If achieved 50% min in final Grade 11 results. (Should the English requirement not be met at NSC Grade 12, then entrance may be granted if the English requirement is met based in the final Grade 11 mark) Where applicants have not met the minimum entry requirements, but have obtained at least 45-49% in English, 55 -59% in Mathematics and 45-49% in Physical Science, they may be admitted if they pass a proficiency test in the subject(s) where they have not met the minimum entry requirements. Only ONE attempt at each relevant proficiency test is permitted per intake. Compulsory tutorial sessions must also be attended.

**National Certificate (Vocational) (NC(V))**

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

**SC: 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.**