ENSURING THE
EXPERTISE TO GROW
SOUTH AFRICA

FEASIBILITY STUDY REPORT ON MECHATRONIC ENGINEERING

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ECSA

TABLE OF CONTENTS

1. INTRODUCTION 3

2. PURPOSE 4

3. RATIONALE FOR THE STUDY ON MECHATRONIC ENGINEERING 4

4. CURRENT STATUS OF MECHATRONIC ENGINEERING IN SOUTH AFRICAN UNIVERSITIES 4

4.1. UNIVERSITY OF CAPE TOWN 5

4.2. NELSON MANDELA UNIVERSITY 7

4.3. STELLENBOSCH UNIVERSITY 10

4.4. TSHWANE UNIVERSITY OF TECHNOLOGY (TUT) 11

4.5. CAPE PENINSULA UNIVERSITY OF TECHNOLOGY (CPUT) 13

5. MECHATRONIC ENGINEERING INTERNATIONALLY 15

5.1. UNIVERSITY OF SYDNEY - AUSTRALIA 15

5.2. SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE (SIUE) – UNITED STATES 17

5.3. UNIVERSITY OF LEEDS – UNITED KINGDOM 19

6. THE CASE FOR MECHATRONIC ENGINEERING 20

7. RECOMMENDATION 21

8. CONCLUSION 21

9. REFERENCE LIST 22

APPENDIX A: LIST OF INSTITUTION OFFERING ACCREDITED MECHATRONIC ENGINEERING 23

1. INTRODUCTION

The Research, Policy and Standards (RPS) Business Unit is tasked with conducting feasibility study report for the introduction of new disciplines on bi-annual basis and has included this target in the Annual Performance Plan (APP). In line with this mandate and the APP target, RPS has identified Mechatronic Engineering as one possible new discipline to conduct such research on within 2019/20 financial year.

Mechatronic Engineering as a qualification is a new, multi-disciplinary approach to understanding the high-tech machinery found in modern manufacturing and processing factories. It combines Mechanical, Electronic and Information Technologies. Mechatronic professionals have a broad array of skills that are in high demand in many companies. The Manufacturing, Engineering and Related SETA (MerSETA) identify Mechatronic artisans, technicians and engineers as scarce skills in South Africa.

Mechatronics as a career is still finding its feet and as such, many may consider it a jack-of-all-trades, master of none type of situation. Mechatronics is not a new field, it has just finally been given a name. In many organisations engineers are given a choice to choose between focusing Mechanical or Electrical divisions. This is due to how businesses in SA are structured and clearly this need to change. Several Mechatronic Engineers are currently found in automation maintenance positions.

In the motor industry, systems such as traction control, ABS and ESP are all examples of Mechatronic systems and these are heavily complicated systems that rely on the processing of data from sensors to enable control of actuators. Mechatronics Engineers are found in many different industries such as the Automotive, Aerospace, Manufacturing, Medical and Communications Industries.

2. PURPOSE

The purpose of this feasibility study report is to provide the Research, Policy and Standards Committee with the status of the Mechatronic Engineering qualification nationally and internationally and trends thereof.

3. RATIONALE FOR THE STUDY ON MECHATRONIC ENGINEERING

The purpose of the study is to check the viability of developing Mechatronic Engineering as a new discipline in addition to the nine current disciplines approved by ECSA, in an effort to address not only the scarcity of the skills in this area but to take advantage of the Fourth Industrial Revolution that has ignited buzzwords such as artificial intelligence, robotics, internet-of-things, quantum computing, and biotechnology. Persons achieving this qualification are able to, independently as well as under supervision, integrate analytical and practical engineering techniques and engineering knowledge to solve engineering problems from well-defined to complex.

4. CURRENT STATUS OF MECHATRONIC ENGINEERING IN SOUTH AFRICAN UNIVERSITIES

Mechatronics as a named profession is new, but the idea has always been there. In the South African context, University of Cape Town has had an accredited BSc (Eng) Mechatronics course since 1997, while Nelson Mandela University has been offering BEng since 2007 and Stellenbosch University since 2005. North-West University on the other hand offers a BEng Electro-Mechanical. Although not offered in the BEng format, University of KwaZulu-Natal do offer Masters through their Mechatronics and Robotic Research Group.

A Diploma and Advanced Diploma in Mechanical Engineering in Mechatronics is offered from institutions such as Tshwane University of Technology and Cape Peninsula University of Technology (CPUT). There are also several Universities of Technology and FET Colleges, which offer courses in Mechatronics. One such training institution is Umbilo Training Specialists in Durban. They are running a free training course, once a month where anyone can come to learn more and expand their knowledge. The graph below illustrates trends and patterns in the statistics

of mechanical engineering and mechatronics between 2013 and 2017. The graph indicate a decline of graduate figures from the high of 2014, however a much better increase in 2017.

NB: The data on the graph is for illustrative purposes only and it is not a true reflection of the statistics of mechatronic engineering as a discipline, it is mixed with the statistics of mechanical engineering discipline.

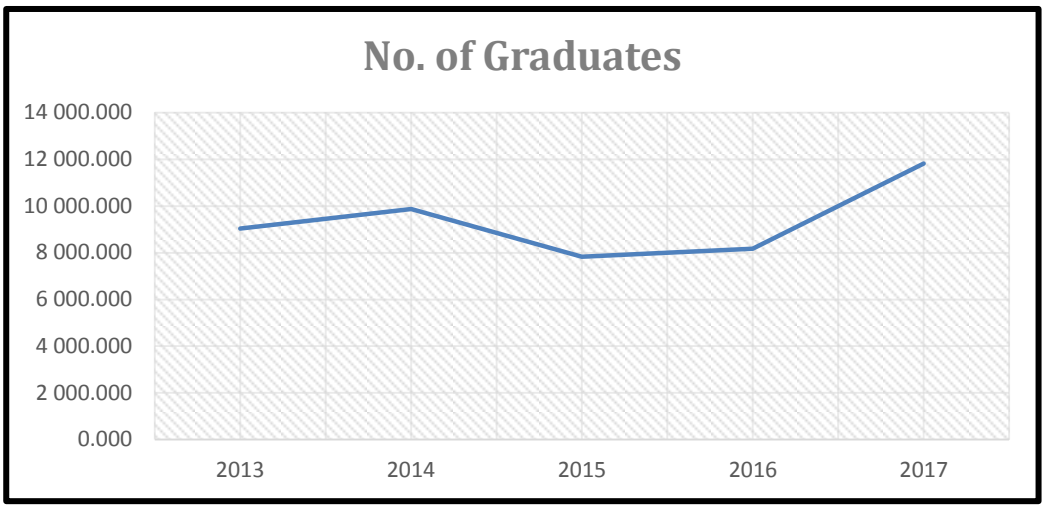

Figure 1 Graph illustration of Mechanical/Mechatronic Engineering graduates from 2013 - 2017

The discussion below indicates each institution's qualification type, admission criteria and what the qualification entails (modules).

4.1. UNIVERSITY OF CAPE TOWN

The University of Cape Town (UCT) offers Bachelor of Science in Engineering (Mechatronics) programme and in addition to BSc (Eng) Mechatronics, UCT offers final-year optional courses in related fields, such as bio-medical engineering, power electronics and machines and industrial management.

Admission requirements

Students who have completed a National Diploma or Bachelor of Technology Degree in Engineering in minimum time and with a grade average of at least 70% and a minimum of 75% for Mathematics courses are legible for entry into the Electrical Engineering, Electrical and Computer Engineering and Mechatronics degree programmes. Students must have qualified for matriculation exemption or the National Senior Certificate (NSC) endorsed for degree studies prior to commencement of the National Diploma (ND) programme.

Program Duration

The program provides for both 4-year and 5-year curriculum to allow more time for learning new concepts, grappling with assignments, asking questions, and obtaining feedback.

Modules

A candidate shall complete approved courses of a value not less than 576 credits and shall comply with the prescribed curriculum requirements such as:

First Year	**Second Year**
Introduction to Electronic Engineering	Computer Science 1015
Mathematics IA for Engineers Extended	Analogue Electronics
Physics A for ASPECT	Vector Calculus for ASPECT
Introduction to Electrical Engineering	Engineering Drawing
Mathematics IB for Engineers Extended	Computer Science 1016
Physics B for ASPECT	Signals and Systems I
	Linear Algebra and DEs for Engineers
	Project Management
	Practical Training

Third Year Embedded Systems I Professional Communication for Electrical Engineering Electronic Devices and Circuits Introduction to Engineering Mechanics Culture, Identity & Globalisation in Africa Introduction to Power Engineering Control Systems Engineering Electromagnetism for Engineers	**Fourth Year** Electrical Engineering Design Principles Energy Conversion Signals & Systems II Engineering Dynamics Law for Engineers Embedded Systems II Engineering Design: Mechatronics Applied Engineering Mechanics Practical Training Approved Complementary Studies Elective F/S
Fifth Year Engineering System Design Professional Communication Studies New Venture Planning Industrial Ecology Final Year Project	

4.2. NELSON MANDELA UNIVERSITY

The University offers three degrees namely BEng (Mechatronics), MEng (Mechatronics), and PhD Engineering (Mechatronics).

Admission Criteria

For **BEng (Mechatronics)**, the minimum NSC statutory requirements for degree entry must be met where; an applicant with NSC Grade 12 Mathematics requires a minimum applicant score of 410.

An achievement rating of at least 60% for Mathematics and at least 65% for Physical Sciences. Alternatively, applicants who completed all modules in the Higher Certificate (Mechatronic Engineering) qualification, with an academic average of 65%, with minimum of 60% for Mathematics 1001 (MAT1001), and minimum of 65% for Physical Sciences 1001 (PHY1001) may be considered.

For **MEng (Mechatronics),** candidates shall be admitted to the study for the qualification of Master of Engineering in Mechatronics only if they hold the qualification of Bachelor of Engineering or Bachelor of Science in Engineering or a qualification deemed by Senate to be equivalent thereto, or if they otherwise qualify for admission in the opinion of Senate. Candidates who have completed Bachelor of Technology in a relevant field may be eligible, at the discretion of the Faculty Management Committee. Additional coursework may, however, be prescribed.

For **PhD Engineering (Mechatronics),** must possess a Master's qualification in Engineering, or a Master's qualification deemed by Senate to be equivalent thereto. Students must have, in the opinion of Senate, attained through practical experience or otherwise a level of competence, which is adequate for the purpose of studies for the degree of Doctor of Philosophy in Engineering (Mechatronics). Recognition of prior learning (RPL) may also be applied.

Program Duration

The program durations are as follows:

- BEng (Mechatronics)= 4 years full-time
- MEng (Mechatronics)= 1 year full and part-time and,
- PhD Engineering (Mechatronics)= 2 years full and part-time

Modules

The qualification covers the following modules:

BEng (Mechatronics) = 4 years full-time

First Year Materials Science I Electrotechnology Ii Engineering Drawing 1 Computer Science For Engineers Ia Computer Science For Engineers Ib	**Second Year** Electronics Ii Digital Electronics Ii Electrotechnology Ii Machine Design Ii Strength Of Materials Ii Thermo-Fluids Ii Dynamics Ii
Third Year Communication Systems Iii Control Systems Iii A Control Systems Iii B Electrical Machines Iii Power Electronics & Drives Iii Mechanical Design Iii Machine Design Iii Microprocessors Iii Strength Of Materials Iii	**Fourth Year** Advanced Manufacturing Systems Iv Professional Communication Process Control And Instrumentation Iv Environmental Engineering Iv Mechatronics Project Iv Project Management 4- Engineering

MEng (Mechatronics) = 1 year full and part-time

- Mechatronics Dissertation

PhD Engineering (Mechatronics) = 2 years full and part-time

- Thesis- Mechatronics

4.3. STELLENBOSCH UNIVERSITY

The mechatronic engineering programme consists of modules from the BEng (Mechanical) and BEng (Electrical and Electronic) programmes. The emphasis in the programme is on Mechatronics, control systems, machine design, electronics and computer systems.

Admission Criteria

The minimum admission requirements for BEng include writing the National Benchmark Tests Academic and Quantitative Literacy Test (AQL), and the Mathematics Test (MAT). A National Senior Certificate with admission to bachelor's studies, or an exemption certificate from the Matriculation Board is also required. An average of at least 70% in the NSC (excluding Life Orientation), Mathematics 70% and Physical Sciences 60% is a must. Language marks that meet one of the following requirements is acceptable:

- English Home Language 40% OR
- English First Additional Language 60% OR
- English First Additional Language 50% AND Afrikaans Home Language 40% or Afrikaans First Additional Language 60%.

Program duration

Stellenbosch University offers candidates a four-year full-time BEng Mechatronic Engineering.

Modules

The BEng Mechatronic Engineering covers the following modules:

First Year	**Second Year**
Applied Mathematics	Applied Mathematics
Engineering Chemistry	Electrotechnique
Engineering Drawings	Thermodynamics
Engineering Mathematics	Engineering Mathematics
Engineering Physics	Fluid Mechanics

Professional Communication Computer Programming Electrotechnique Strength of Materials Mechatronic Engineering	Introductory Machine Design Material Science Numerical Methods Strength of Materials
Third Year Complementary Studies Electrical Drive Systems Philosophy and Ethics Machine Design Modelling Computer Systems Control Systems Electronics Machine Design Vacation Training Vibration and Noise	**Fourth Year** Mechatronic Project Mechatronic Project Design Electronics Heat Transfer Mechatronics Project Management Mechanical Design Environmental Engineering Production Management Vacation Training

4.4. TSHWANE UNIVERSITY OF TECHNOLOGY (TUT)

Tshwane University of Technology currently offers the National Diploma Engineering: Mechatronics and Bachelor of Engineering Technology in Mechatronic Engineering. These qualifications are being phased-out and replaced with Diploma and Advanced Diploma respectively, in line with the communique by Higher Education Qualifications Sub-Framework (HEQSF).

Admission Criteria

For the National Diploma, a minimum of Senior Certificate or an equivalent qualification, with B symbols (70 – 79%) at Standard Grade or C symbols (60 – 69%) at Higher Grade for English, Mathematics and Physical Science.

The applicant will be considered for admission to the programme, if any of the following qualifications has been completed:

- Higher Certificate in Mechanical Engineering (NQF Level 5 - 140 credits): at least 60% for all modules completed;
- Advanced Certificate in Mechanical Engineering (NQF Level 6 - 140 credits): at least 60% for all modules completed;
- National Diploma: Engineering: Mechanical (NQF Level 6 - 3,000 credits): at least 55% for all subjects completed;
- National Diploma: Mechatronics (NQF Level 6 - 3,000 credits): at least 55% for all subjects completed.

Program Duration

The National Diploma Engineering: Mechatronics has minimum duration of three years and Bachelor of Engineering Technology in Mechatronic Engineering has a minimum of one year.

Modules

The modules are broken down as follows:

First Year	**Second Year**
Engineering Communication	Computer-Aided Design
Electrotechnology	Electronic Technology
Mathematics	Electrotechnology II
Mechanical Engineering Drawing	Mathematics II
Manufacturing Engineering	Materials and Processing II
Mechanics	Digital Technology I
	Mathematics III
	Mechanics II
	Strength of Materials II*
	Thermo-Flow

Third Year	Fourth Year
Control of Machines	Mechatronic Engineering Practice
Mathematics II	(Work-Integrated Learning*)
Computer Studies	
Electronic Technology	
Digital Technology II	
Electric Machines	
Mechanical Engineering Design II	
Mechatronic Engineering Design	
Mechanics III	
Networks and Communication	
Strength of Materials III*	

4.5. CAPE PENINSULA UNIVERSITY OF TECHNOLOGY (CPUT)

Cape Peninsula University of Technology (CPUT) currently offers the National Diploma Mechanical Engineering: Mechatronics and Bachelor of Technology: Mechanical Engineering (Mechatronics). These qualifications are currently being phased-out and replaced by Diploma in Mechanical Engineering in Mechatronics and Advanced Diploma Mechanical Engineering in Mechatronics respectively in line with the communique by Higher Education Qualifications Sub-Framework (HEQSF).

Admission Criteria

For the National Diploma, a minimum of Senior Certificate or an equivalent qualification, with B symbols (70 – 79%) at Standard Grade or C symbols (60 – 69%) at Higher Grade for English, Mathematics and Physical Science.

The applicant will be considered for admission to the programme, if any of the following qualifications has been completed:

- Higher Certificate in Mechanical Engineering (NQF Level 5 - 140 credits): at least 60% for all modules completed;

- Advanced Certificate in Mechanical Engineering (NQF Level 6 - 140 credits): at least 60% for all modules completed;
- National Diploma: Engineering: Mechanical (NQF Level 6 - 3,000 credits): at least 55% for all subjects completed; and
- National Diploma: Mechatronics (NQF Level 6 - 3,000 credits): at least 55% for all subjects completed.

Program Duration

The National Diploma Engineering: Mechatronics has minimum duration of three years and Bachelor of Engineering Technology in Mechatronic Engineering has a minimum of one year.

Modules

The modules are broken down as follows:

First Year	**Second Year**
Mechanics 1	Fluid Mechanics 2
Communication Studies 1	Strength of Materials 3
Mechatronics Project 1	Computer Aided Manufacturing 2
Mathematics 1	Mechatronic Systems 2
Computer and Programming Skills 1	Electrical Engineering & Electronics 2
Fluid Mechanics 2	Mechatronic Systems 3
Strength of Materials 2	Mechanical Engineering Design 2
Mechanical Engineering Drawing 1	Electrical Engineering & Electronics 3
Electrical Engineering & Electronics 1	Hydraulic Machines 3
Mathematics 2	Applied Strength of Materials 3

Third Year	Fourth Year
Engineering Professional Studies	Mechatronic design project
Computer Integrated Manufacturing	Engineering Mathematics
Process Control	Mechatronic Control Systems
Industrial Networking	Research Methodology
Mechatronic Design	Mechatronic System Design & Simulation
Mechatronics Industrial Project 2	Thermo-Fluids
	Electronic Devices & Systems
	Environmental Engineering
	Mechanics of Machines
	Project Management
	Stress Analysis

5. MECHATRONIC ENGINEERING INTERNATIONALLY

The ECSA is part of global community, therefore, it is imperative to benchmark and compare the South Africa mechatronic engineering with other international institutions. The institutions were selected randomly to get an insight of how the programme is structured outside South African boarders. The institutions selected are University of Sydney in Australia, Southern Illinois University Edwardsville (SIUE) – United States and University of Leeds in the United Kingdom.

5.1. UNIVERSITY OF SYDNEY - AUSTRALIA

Admission Criteria

The University offers the Bachelor of Engineering Honours (Mechatronic) which combines mechanical, electronic and software engineering to enable you to create computer-controlled machines and consumer products. Admission to this course is based on the following criteria:

- a secondary education qualification (including national and international equivalents), or approved higher education study, including approved preparation courses;
- English language requirements where these are not demonstrated by sufficient qualifications taught in English;
- Test of English as a Foreign Language (TOEFL) – Internet Based Test (IBT) score: A minimum result of 85 overall including a minimum result of 17 in Reading, Listening and Speaking and 19 in Writing;
- International English Language Testing System (IELTS) score: A minimum result of 6.5 overall and a minimum result of 6.0 in each band;
- TOEFL – Paper Based Test (PBT) score: A minimum result of 565 overall including a minimum result of 4.5 in Writing.

Program duration

Throughout the four-year degree, students cover a range of fields, including mechanism and machine analysis and design, electrical circuit theory and electronics, digital electronics and computer systems, power electronics and electrical machines, systems modelling and simulation, and robotic systems. Core units will provide students with a foundational knowledge in mechatronics, before allowing them to specialise in elective units in their third and fourth years. A 12-week internship will provide learners with invaluable industry experience and professional networking opportunities. In the fourth year an embedded honours thesis will allow students to specialise further by designing a research project in an area that interests them.

Modules

- Chemical Engineering (Major)
- Computer Engineering (Major)
- Construction Management (Major)
- Electrical Engineering (Major)
- Environmental Engineering (Major)
- Geotechnical Engineering (Major)

- Humanitarian Engineering (Major)
- Information Technology (Engineering) (Major)
- Internet of Things (Major)
- Materials (Major)
- Mechanical Engineering (Major)
- Power Engineering (Major)
- Space Engineering (Major)
- Structures (Major)
- Telecommunications Engineering (Major)
- Transport Engineering (Major)

5.2. SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE (SIUE) – UNITED STATES

SIUE offers Bachelor of Science in Mechatronics and Robotics Engineering. While there are a few Bachelor of Science (BS) programs in mechatronics and/or robotics in the U.S. and several abroad, SIUE is the only such program in the state of Illinois and the Midwest.

Admission Criteria

Receiving a diploma/degree from a high school or university/college in the U.S. or any of the American Association of Collegiate Registrars and Admissions Officers (AACRAO) recommended countries. International English Language Testing Systems - (IELTS) - Score - 6.5. Test of English as a Foreign Language (TOEFL) - Score - Internet Based - 79, Paper Based – 550. Michigan Test of English Language Proficiency - Score – 64. Pearson Test in English (PTE) - Score – 53. There are no set criteria for professional certificates.

Program duration

This is a 4-year degree hosted by the school of engineering.

Modules

This programme cover the following modules:

First Year Engineering Problem Solving (NFS) Engineering Chemistry (BPS) Engineering Chemistry Lab (EL) English Composition I Calculus I (BPS, FQR) English Composition II Intro to Computing for Engineers Calculus II (BPS) Physics I for Engineering (BPS) University Physics I Lab (EL)	**First Year** Interpersonal Communications (EUSC) Statics Circuit Analysis I Calculus III (BPS) Physics II for Engineering (BPS) University Physics II Lab (EL) Dynamics Mechanics of Solids Circuit Analysis II Principles of Macroeconomics (BSS) Differential Equations I (BPS) Application for Upper Division
Third Year Digital System Design Dynamic Systems Modelling Numerical Simulation Design of Machine Elements Math 321 Linear Algebra Breadth Fine & Performing Arts (BFPA) Introduction to Mechatronics Sensors and Actuators Automatic Control Microcontroller Engineering, Ethics & Professionalism (BHUM)	**Fourth Year** Robotics, Dynamics & Controls Design in Mechatronics & Robotics I Technical Elective I Engineering Economic Analysis Interdisciplinary Studies (IS) / Experience Global Cultures (EGC) Health Experience (EH) Technical Elective II Computer-Integ Manufacturing Systems Design in Mechatronics & Robotics II Breadth Life Science (BLS) Statistics for Application (BICS)

5.3. UNIVERSITY OF LEEDS – UNITED KINGDOM

University of Leeds offers Mechatronics and Robotics BEng (Hons) and it is delivered jointly by the schools of Electronic and Electrical Engineering, Mechanical Engineering, and Computing, building on the cutting-edge research being carried out in the National Facility for Innovative Robotic Systems, which is hosted on campus.

Admission Criteria

Candidates applying for this degree must possess A-level: AAA including Mathematics. Where an A-Level Science subject is taken, the university requires a pass in the practical science element, alongside the achievement of the A-Level at the stated grade. Excludes A-Level General Studies or Critical Thinking. Extended Project Qualification (EPQ) - The value, effort and enthusiasm applicants make in the Extended Project, and where an applicant offers an A in the EPQ we may make an offer of AAB at A-Level (any required subjects such as Mathematics must still be at grade A). General Certificate of Secondary Education (GCSE): English Language at grade C (4) or above, or an appropriate English language qualification.

Program duration

Students can choose to take either the four-year Integrated Masters (MEng, BEng) or the three-year Bachelor's (BEng) degree on this course.

Modules

The programme covers the following modules:

First Year	**Second Year**
Programming for the Web	Artificial Intelligence
Circuit Analysis and Design	Electronic Circuit Design
Communications for Robotics	Power Electronics
Digital Electronics and Microcontrollers	Control Systems
Engineering Mathematics	Embedded Systems Project

Further Engineering Mathematics Electronic Design Project Introduction to Mechatronics and Robotics Mechanics for Mechatronics and Robotics	Microprocessors and Programmable Logic Sensors, Actuators and Mechanisms Design & Manufacture for Mechatronics & Robotics
Third Year Professional Studies Embedded Systems Individual Engineering Project Robotics and Machine Intelligence Intelligent Systems and Robotics Electric Machines Electric Power Systems Biomedical Engineering Design Vehicle Design and Analysis	**Fourth Year** Modern Industry Practice Team Project Bio-Inspired Computing Power Electronics and Drives FPGA Design for System-on-Chip Control Systems Design Embedded Microprocessor System Design Medical Electronics and E-Health Aerial Robotics Biomechatronics and Medical Robotics

6. THE CASE FOR MECHATRONIC ENGINEERING

Mechatronics is an interdisciplinary branch of engineering, which combines a fundamental background in mechanical engineering with light-current electrical engineering. Many universities and other institutions world-wide are now offering courses or degrees in Mechatronics, and it is increasingly recognised that this combination of mechanical and electrical engineering studies equips graduates with an excellent basis upon which to build valuable engineering roles in modern industry.

Apart from receiving a thorough grounding in both electrical and mechanical engineering, the Mechatronics student will gain a foundation of understanding in physical science, advanced engineering mathematics, electro-mechanical control theory, microcomputer technology, systemic engineering design and some principles of engineering management. In addition, the Bachelor of

Science in Engineering (Mechatronics) programme can offer optional courses in related fields, such as bio-medical engineering, power electronics and machines and industrial management.

The Mechatronics engineer in industry may require expertise across a broad range of engineering disciplines, and will be especially well suited to a career in light manufacturing or process control. Mechatronics engineers may become involved in fields such as instrumentation, automation, robotics, bio-medical engineering or machine vision. The Mechatronics Programmes generally aims to equip its graduates with a solid and broad-based engineering education, including the skills in design and the knowledge of computers and other digital systems hardware, which will be necessary for a successful future career in any of these environments.

7. RECOMMENDATION

It is recommended that the ECSA consider adding Mechatronics Engineering to the nine existing engineering disciplines. The Engineering Profession Act, Act 46 0f 2000, commands ECSA in terms of section 14(f) to encourage and itself to undertake research into matters relating to the engineering profession.

8. CONCLUSION

A new discipline specific requirement should be considered, and the required panels and registration processes should be investigated to include Mechatronic Engineering Professional registration. Though this allowance will push present procedural boundaries, it will set the trend for future developments in Engineering, and ensure that the entire field and present professional bodies do not stagnate and miss the mark with technological organisational evolution.

9. REFERENCE LIST

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10. University of Leeds: Mechatronics and Robotics BEng (Hons). https://engineering.leeds.ac.uk/courses/UG/F543/mechatronics-and-robotics#section3

The Feasibility Study Report for:

Mechatronic Engineering

Revision 0 dated 30 September 2019 and consisting of 23 pages was reviewed for adequacy by the Business Unit Manager and is approved by the Executive: Research, Policy and Standards **(RPS)**.

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Business Unit Manager

30/09/2019

Date

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Executive: RPS

30/09/2019

Date

This definitive version of the policy is available on our website.

APPENDIX A: LIST OF INSTITUTION OFFERING ACCREDITED MECHATRONIC ENGINEERING

1. University of Cape Town

Degree and Branch	Duration	Accreditation Period		Accreditation Visit Type		
	Years	From	To	Interim	Final	Regular
BSc (Eng) (Mechatronic Engineering)	4	1997	2020			x

2. Nelson Mandela University

Degree and Branch	Duration	Accreditation Period		Accreditation Visit Type		
	Years	From	To	Interim	Final	Regular
BEng(Mechatronics)	4	2007	2019			x

3. North-West University

Degree and Branch	Duration	Accreditation Period		Accreditation Visit Type		
	Years	From	To	Interim	Final	Regular
BEng (Electromechanical Engineering)	4	2017	2019			x

4. Universiteit van Stellenbosch [University of Stellenbosch]

Degree and Branch	Duration	Accreditation Period		Accreditation Visit Type		
	Years	From	To	Interim	Final	Regular
BIng (Megatronika) [Mechatronic]	4	2005	2023			x

TECHNOLOGY PROGRAMMES

1. Tshwane University of Technology

Degree and Branch	Site of Delivery	Duration Year	Accreditation Period		Accreditation Visit Type		
			From	To	Interim	Final	Regular
B Tech: Engineering: Mechanical: Mechatronics	Pretoria	1	1996	2021			x

2. Cape Peninsula University of Technology

Degree and Branch	Delivery Site	Duration Year	Accreditation Period		Accreditation Visit Type		
			From	To	Interim	Final	Regular
B Tech: Engineering: Mechatronics	Bellville	1	2012	2020			x

DIPLOMA PROGRAMMES

1. Tshwane University of Technology

Qualification and Branch	Site of Delivery	Duration Year	Accreditation Period		Accreditation Visit Type		
			From	To	Interim	Final	Regular
ND: Engineering: Mechatronics	Pretoria	3	1991	2021			x

2. UNISA

Qualification and Branch	Duration Year	Accreditation Period		Accreditation Visit Type		
		From	To	Interim	Final	Regular
ND: Engineering: Electrical: Mechatronics	3	2000	2023			**x**

3. Cape Peninsula University of Technology

Qualification and Branch	Delivery Site	Duration Year	Accreditation Period		Accreditation Visit Type		
			From	To	Interim	Final	Regular
ND: Engineering: Mechatronics	Bellville & Saldanha	3	2012	2020			**x**

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