



# The Future Reimagined

FACULTY OF ENGINEERING  
AND THE BUILT ENVIRONMENT [FEBE]  
**2019/20 Postgraduate Programmes**  
Degrees & Diplomas

# FACULTY OF **ENGINEERING AND THE BUILT ENVIRONMENT**

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The University reserves the right, at any time, should circumstance dictate, to make changes to, or withdraw any of the opportunities on offer.

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## FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

### MAGISTER TECHNOLOGIAE DEGREE PROGRAMMES (MTech)

**Name of programme:**

MTech (Engineering: Civil) Research Based

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Chemical, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of qualification: A learner achieving this qualification will be competent to conduct research under minimal guidance and contribute to knowledge production in the Engineering environment with success.

Qualification outcomes: Demonstrate the capability to identify a problem or need in industry, and apply research methodologies to address the need or problem.

**Name of programme:**

MTech (Engineering: Chemical) Research Based

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Chemical, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year

Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of qualification: This qualification is intended for chemical engineers or technologists working in process related industries. Learners achieving this qualification have the competence to conduct independent research in chemical engineering, and contribute significantly to knowledge production through the understanding, application and evaluation of existing knowledge. The research problem, its justification, process and outcome is reported in a thesis, which complies with the generally accepted norms at that level.

**Qualification outcomes:** The qualifying learner will have the ability to:

- collect and organise information in the selected field/area of research.
- apply research methods and techniques appropriately and correctly.
- make a significant contribution by recommending improvements to existing Chemical Engineering Science and Technology.

**Name of programme:**

MTech (Construction Management) Research Based

**Admission requirements:** A BTech: Construction Management, or an equivalent qualification at an equivalent standard. Students are selected on academic merit and approved field of study.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of qualification: This qualification is intended to enable graduates to apply integrated technical knowledge or skills and advanced analysis and problem solving to a particular field, specialising in construction management, property and related fields, through involvement in an applied research project.

**Qualification outcomes:** Conduct research and development in a specialised area and engage in the transfer of technology in the field of construction management and property development.

**Name of programme:**

MTech (Engineering: Electrical) Research Based

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Electrical, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: A qualifying student will be able to conduct independent research, with minimum guidance,

in a chosen field of Electrical Engineering, and contribute to knowledge production in that field.

**Qualification outcomes:**

1. Demonstrate knowledge and understanding of the field/area of investigation.
  2. Apply research methods and techniques appropriately and correctly.
- 

**Name of programme:**

**MTech (Extraction Metallurgy) Research Based**

**Admission requirements:** A Baccalaureus Technologiae: Extraction Metallurgy, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: A qualifying learner at this level is competent in applying specialist knowledge and research methodology in a metallurgical environment thus contributing to the research and development needs of the metallurgic industry and mining community. The qualified person will be able to register with ECSA as a professional technologist.

**Qualification outcomes:**

The qualifying learner should have the capability to:

- initiate and execute applied research in a range of metallurgical activities to full completion.
  - function at middle to upper management level in a metallurgical environment.
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**Name of programme:**

**MTech (Engineering: Civil) Research Based**

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Chemical, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Qualification outcomes – Demonstrate the capability to identify a problem or need in industry, and apply research methodologies to address the need or problems.

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**Name of programme:**

**MTech (Engineering: Chemical) Research Based**

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Chemical, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification – This qualification is intended for chemical engineers or technologists working in process-related industries. Students who have obtained this qualification will be competent to conduct independent research in chemical engineering, and contribute significantly to knowledge production through the understanding, application and evaluation of existing knowledge. The research problem, its justification, process and outcome is reported in a thesis, which complies with the generally accepted norms at that level.

**Qualification outcomes:** The qualifying student will have the ability to:

1. Collect and organise information in the selected field/area of research.
  2. Apply research methods and techniques appropriately and correctly.
  3. Make a significant contribution by recommending improvements to existing Chemical Engineering Science and Technology fields.
- 

**Name of programme:**

**MTech (Engineering: Industrial) Research Based**

**Admission requirements:** A Baccalaureus Technologiae: Industrial Engineering, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: This qualification is intended to allow graduates to apply integrated operations techniques, together with advanced analysis and problem-solving, to a particular specialisation in the field of Industrial Engineering/Operations Management, through involvement in an applied research project.

**Qualification outcomes:** Conduct research and development in a specialised area and engage in the transfer of technology in the field of Industrial Engineering or Operations Management.

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**Name of programme:****MTech (Engineering: Mechanical) Research Based**

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Mechanical, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: This qualification is intended for persons who will make a contribution, through research, to understanding the application and evaluation of existing knowledge in a specialised area of technology. They will also demonstrate a high level of overall knowledge in that area, ranging from fundamental concepts to advanced theoretical or applied knowledge.

**Qualification outcomes:** Complete research successfully in engineering processes, products or systems.

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**Name of programme:****MTech (Engineering: Metallurgy) Research Based**

**Admission requirements:** A Baccalaureus Technologiae: Engineering: Metallurgy, or an equivalent qualification at an equivalent standard.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: A qualifying learner at this level is competent in applying specialist knowledge and research methodology in a metallurgical environment thus contributing to the research and development needs of the metallurgical industry and mining community. The qualified person will be able to register with ECSA as a Professional Technologist.

**Qualification outcomes:** The qualifying learner should have the capability to:

- initiate and execute applied research in a range of metallurgical activities to full completion.
  - function at middle to upper management level in a metallurgical environment.
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**Name of Programme:****MTech (Operations Management) Research Based**

**Admission Requirements:** An applicant must hold a BTech: Operations Management or an equivalent qualification at NQF Level 7 as determined by a

Status Committee. For admission to an MTech programme, all applications will be reviewed in terms of academic performance and prior qualifications, and if necessary, the applicants will be interviewed to ascertain, amongst others, interest in the postgraduate study and the department's ability to accommodate the research interest.

**Duration of Programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of the programme:** Purpose of qualification: The qualification aims to develop intellectual and professional skills, and provides the student with the opportunity to show evidence of independent and original scientific work. This qualification will further provide the student with the opportunity to display competence in the application of relevant research methodology, and the proper written and/or oral communication of the research process and findings and to reflect on the research process and findings.

**Qualification outcomes:** Conduct research and development in a specialised area and engage in the transfer of technology in the field of quantity surveying and property development. The MTech: Operations Management will be conferred on students who have completed the research project and dissertation successfully.

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**Name of programme:****MTech (Quantity Surveying) Research Based**

**Admission requirements:** A BTech: Quantity Surveying, or an equivalent qualification at an equivalent standard. Students are selected on academic merit and approved field of study.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: This qualification is intended to enable graduates to apply integrated technical knowledge or skills and advanced analysis and problem solving to a particular specialisation in quantity surveying, property development and other related fields, through involvement in an applied research project.

**Qualification outcomes:** Conduct research and development in a specialised area and engage in the transfer of technology in the field of quantity surveying and property development

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## ENGINEERING MASTER'S DEGREE PROGRAMMES (MEng)

### Name of programme:

#### MEng (Electrical and Electronic Engineering) Research Based

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

Final acceptance into the programme is only given after successful presentation of a research seminar after six months of enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty.

### Duration of programme:

Full-time: 1 year / Part-time: 2 years

### Contact details:

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an engineer with advanced abilities in applying fundamental engineering sciences and design, and synthesis and related principles to specific problems of society at large. One of the main objectives of this process is to develop an advanced capability to do own engineering research in a fundamental manner. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve engineering research and development problems creatively and innovatively by applying relevant fundamental knowledge of inter alia Mathematics, basic Science and Engineering Sciences in the chosen field of research.
- plan and manage Engineering research projects demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of research.
- organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable level of investigations, research and/or experiments by applying appropriate theories and methodologies and perform appropriate data analysis and interpretation.

- communicate effectively, both orally and in writing, with Engineering and specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate Engineering research methods, skills, tools, technology and information technology effectively and critically in research and development practice and show an understanding and a willingness to accept responsibility for the impact that interdisciplinary research/development activities have on society and the environment.
- perform synthesis of components, systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of research.
- employ various learning strategies and skills to master outcomes required in preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in interdisciplinary fields.
- participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of research/development activities.
- explore where applicable education and career opportunities in Engineering research and development.
- organise and develop entrepreneurial opportunities through engineering, technical research, development and/or managerial skills.

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### Name of programme:

#### MEng (Mechanical Engineering) Research Based

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

Final acceptance into the programme is only given after successful presentation of a research seminar after six months of enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty.

### Duration of programme:

Full-time: 1 year / Part-time: 2 years

### Contact details:

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an engineer with advanced abilities in applying fundamental Engineering Sciences and design, and synthesis and related principles to specific problems of society at large. One of the main objectives of this process is to develop an advanced capability to do own Engineering research in a fundamental manner. It also enforces an approach to lifelong learning.



**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering research and development problems creatively and innovatively by applying relevant fundamental knowledge of inter alia. Mathematics, basic Science and Engineering Sciences in the chosen field of research.
- plan and manage Engineering research projects demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) Engineering research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, and community or in multidisciplinary environments in the chosen field of research.
- organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and take responsibility within his/her own limits of competence and to exercise judgment commensurate with knowledge and expertise pertaining to the field of research.
- plan and conduct applicable levels of investigations, research and/or experiments by applying appropriate theories and methodologies and perform data analysis and interpretation.
- communicate effectively, both orally and in writing, with Engineering and specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate research methods, skills, tools, technology and information technology effectively and critically in Engineering research and development practice, and show an understanding and a willingness to accept responsibility for the impact that Engineering research and development activities have on society and the environment.
- perform procedural and non-procedural design and synthesis of components, systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of research.
- employ various learning strategies and skills to master outcomes required preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the Engineering field.
- Participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of Engineering research and development activities.

- explore, where applicable, education and career opportunities through Engineering problem solving, design, technical research and managerial skills.
- organise and develop entrepreneurial opportunities through Engineering, technical research, development and/or managerial skills.

**Name of programme:**

**MEng (Civil Engineering) Research Based**

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an engineer with advanced abilities in applying fundamental Engineering Sciences and design, and synthesis and related principles to specific problems of society at large. One of the main objectives of this process is to develop an advanced capability to do own Engineering research in a fundamental manner. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering research and development problems creatively and innovatively by applying relevant fundamental knowledge of inter alia Mathematics, basic Science and Engineering Sciences in the chosen field of research.
- plan and manage Engineering research projects demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) Engineering research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of research.
- organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable levels of investigations, research and/or experiments by applying appropriate theories and methodologies and perform data analysis and interpretation.
- communicate effectively, both orally and in writing, with Engineering and specifically research audiences and the community at large in so far as they are

- affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate Engineering research methods, skills, tools, technology and information technology effectively and critically in Engineering research and development practice and show an understanding and a willingness to accept responsibility for the impact that Engineering research and development activities have on society and the environment.
  - perform procedural and non-procedural design and synthesis of components, systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of research.
  - employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the Engineering field.
  - participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
  - demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of Engineering research and development activities.
  - explore, where applicable, education and career opportunities in Engineering research and development.
  - organise and develop entrepreneurial opportunities through Engineering, technical research, development and/or managerial skills.

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**Name of programme:****MEng (Engineering Management) Lectured**

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Prof JHC Pretorius / Tel: 011 559 3824 / Email: ginar@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an engineer with advanced abilities in applying fundamental Engineering Management Sciences and design, and synthesis and related principles to specific management systems problems of society at large. One of the main objectives in this process is to develop an advanced capability to do independent systems engineering and management research in a fundamental manner. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering research and development problems creatively and innovatively by applying relevant

- fundamental knowledge of inter alia Mathematics, basic Science and/or Engineering and Management Sciences in the chosen field of research.
- plan and manage Engineering Management research projects, demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of research.
- organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and take responsibility within his/her own limits of competence and exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable level of investigations, research and/or experiments by applying appropriate theories and methodologies and perform data analysis and interpretation.
- communicate effectively, both orally and in writing, with engineering and specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate Engineering Management research methods, skills, tools, technology and information technology effectively and critically in Engineering research and development practice and show an understanding and a willingness to accept responsibility for the impact that research and development activities have on society and the environment.
- evaluate systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of research.
- employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the Engineering Management field.
- participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of Engineering Management research and development activities.
- explore, where applicable, education and career opportunities in Engineering Management research and development.
- organise and develop entrepreneurial opportunities through Engineering, technical research, development and/or managerial skills.



**Name of programme:****MEng (Engineering Management) Research Based**

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level. Final acceptance into the programme is only given after successful presentation of a research seminar after six months of enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Prof JHC Pretorius / Tel: 011 559 3824 / Email: ginar@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an engineer with advanced abilities in applying fundamental Engineering Management Sciences and design, and synthesis and related principles to specific management systems problems of society at large. One of the main objectives in this process is to develop an advanced capability to do independent systems engineering and management research in a fundamental manner. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering research and development problems creatively and innovatively by applying relevant fundamental knowledge of inter alia Mathematics, basic Science and/or Engineering and Management Sciences in the chosen field of research.
- plan and manage Engineering Management research projects, demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of research.
- organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable levels of investigations, research and/or experiments by applying appropriate theories and methodologies and perform data analysis and interpretation.
- Communicate effectively, both orally and in writing, with Engineering and specifically research audiences and the community at large in so far as they are

affected by the research using appropriate structure, style and graphical support.

- use and assess appropriate Engineering Management research methods, skills, tools, technology and information technology effectively and critically in Engineering research/development practice and show an understanding and a willingness to accept responsibility for the impact that research/development activities have on society and the environment.
- evaluate systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of research.
- employ various learning strategies and skills to master outcomes required preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the Engineering Management field.
- participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of Engineering Management research and development activities.
- explore, where applicable, education and career opportunities in Engineering Management research and development.
- organise and develop entrepreneurial opportunities through Engineering, technical research, development and/or managerial skills.

**Name of programme:****MEng (Structural Engineering) Coursework****Admission requirements and selection criteria:**

A four year professional Bachelor's degree in Civil Engineering

OR

A Bachelor Honours degree or Postgraduate Diploma in Civil Engineering or an affiliated Engineering field

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** The purpose of the programme is to develop an engineer with advanced abilities in applying fundamental structural engineering sciences, design and synthesis to specific structural engineering problems in society at large. One of the main objectives is to develop an advanced capability to do fundamental structural engineering research independently and, in so doing, promote lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering research and development problems creatively and innovatively by applying relevant fundamental knowledge of inter alia Mathematics, basic Science and/or Engineering and Management Sciences in the chosen field of research.
- plan and manage Engineering Management research projects, demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of research.
- organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable levels of investigations, research and/or experiments by applying appropriate theories and methodologies and perform data analysis and interpretation.
- Communicate effectively, both orally and in writing, with Engineering and specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate Engineering Management research methods, skills, tools, technology and information technology effectively and critically in Engineering research/development practice and show an understanding and a willingness to accept responsibility for the impact that research/development activities have on society and the environment.
- evaluate systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of research.
- employ various learning strategies and skills to master outcomes required preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the Engineering Management field.
- participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of Engineering Management research and development activities.
- explore, where applicable, education and career opportunities in Engineering Management research and development.

- organise and develop entrepreneurial opportunities through Engineering, technical research, development and/or managerial skills.

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**Name of programme:**

**Master of Sustainable Urban Planning and Development (Lectured)**

**Purpose of the qualification:** The purpose of the programme is to develop built environment professionals specialising in the sustainable planning, design, development and management of urban centres. These graduates will acquire advanced abilities in applying sustainable development principles to urban development to benefit societies at large. One of the main objectives is to develop an advanced capability to independently conduct fundamental urban issues related research and as such promote a lifelong learning approach.

**Admission requirements:** Any holder of a Bachelor honours degree in any relevant field, such as technological, commercial, science and arts will be eligible for admission to study towards the Master of Sustainable Urban Planning and Development OR Holders of Bachelor of Technology Degrees with additional research experience at Honours Level or participation in a bridging programme and a minimum of 2 years work experience will also be eligible for admission to study towards the Master of Sustainable Urban Planning and Development.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of the programme:**

On completion of this programme the student will be able to:

- understanding of relevant theory useful in solving planning, development and management problems in cities of the developing world;
- reflect on the usefulness of principles of sustainable development to understand the socio-economic and environmental imperatives in urban areas
- demonstrate a high level of understanding of smart cities and the need for provision of adequate and intelligent infrastructure in urban areas
- demonstrate the imperatives in managing the rapidly growing cities of the developing world
- exhibit an understanding of the research process and requirements in urban planning and development
- engage theoretical frameworks relevant to the development of urban space and be able to complete a dissertation within the built environment and related fields

- Organise and develop entrepreneurial opportunities through urban research, development and management skills.

## MAGISTER PHILOSOPHIAE DEGREE PROGRAMMES (MPhil)

### Name of programme:

#### MPhil (Electrical and Electronic Engineering) Research based

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

Final acceptance into the programme is only given after successful presentation of a research seminar after six months of enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty.

### Duration of programme:

Full-time: 1 year / Part-time: 2 years

### Contact details:

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Qualification outcomes: The student is able to:

- identify, assess, formulate, interpret, analyse and solve research and development problems creatively and innovatively by applying relevant interdisciplinary knowledge in the chosen field of research.
- plan and manage research projects demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of interdisciplinary research.
- organise and manage him/herself and his/her activities responsibly, effectively and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable level of investigations, research and/or experiments by applying appropriate theories and methodologies and perform appropriate data analysis and interpretation.
- communicate effectively, both orally and in writing, with specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate research methods, skills, tools, technology and information technology effectively and critically in research and development practice and show an understanding and a willingness to accept responsibility

for the impact that interdisciplinary research and development activities have on society and the environment.

- perform synthesis of systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of interdisciplinary research.
- employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the interdisciplinary field.
- participate as a responsible citizen in the life of local, national and global communities by acting ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of research/development activities.
- explore, where applicable, education and career opportunities in research/development.
- organise and develop entrepreneurial opportunities through technical research, development and/or managerial skills.

### Name of programme:

#### MPhil (Mechanical Engineering) Research Based

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

Final acceptance into the programme is only given after successful presentation of a research seminar after six months of enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty.

### Duration of programme:

Full-time: 1 year / Part-time: 2 years

### Contact details:

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an intellectual with advanced abilities in applying fundamental Engineering Sciences or related interdisciplinary principles to specific problems of the society at large. One of the main objectives in this process is to develop an advanced capability to do own Engineering research of an inter/intra disciplinary nature in a fundamental manner. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve research and development problems creatively and innovatively by applying relevant interdisciplinary knowledge in the chosen field of research.



- plan and manage research projects demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of interdisciplinary research.
- organise and manage him/herself and his/her activities responsibly, effectively and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable levels of investigations, research and/or experiments by applying appropriate theories and methodologies and perform appropriate data analysis and interpretation.
- communicate effectively, both orally and in writing, with specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support.
- use and assess appropriate research methods, skills, tools, technology and information technology effectively and critically in research and development practice and show an understanding and a willingness to accept responsibility for the impact that interdisciplinary research and development activities have on society and the environment.
- perform synthesis of systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of interdisciplinary research.
- employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the interdisciplinary field.
- participate as a responsible citizen in the life of local, national and global communities by acting ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of research and development activities.
- explore, where applicable, education and career opportunities in research and development.
- organise and develop entrepreneurial opportunities through technical research, development and/or managerial skills.

**Name of programme:****MPhil (Civil Engineering) Research Based**

**Admission requirements:** An approved four-year Bachelor's Degree in Engineering or similar approved Degree on Honours level.

Final acceptance into the programme is only given after successful presentation of a research seminar after six months of enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an intellectual with advanced abilities in applying fundamental Engineering Sciences or related interdisciplinary principles to specific problems of society at large. One of the main objectives in this process is to develop an advanced capability to do own Engineering research of an inter/intra disciplinary nature in a fundamental manner. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve research and development problems creatively and innovatively by applying relevant interdisciplinary knowledge in the chosen field of research.
- plan and manage research projects demonstrating an underlying fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of interdisciplinary research.
- organise and manage him/herself and his/her activities responsibly, effectively and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable level of investigations, research and/or experiments by applying appropriate theories and methodologies and perform appropriate data analysis and interpretation.
- communicate effectively, both orally and in writing, with specifically research audiences and the community at large in so far as they are affected by the research using appropriate structure, style and graphical support;

- use and assess appropriate research methods, skills, tools, technology and information technology effectively and critically in research and development practice and show an understanding and a willingness to accept responsibility for the impact that interdisciplinary research and development activities have on society and the environment.
- perform synthesis of systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of interdisciplinary research.
- employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the interdisciplinary field.
- participate as a responsible citizen in the life of local, national and global communities by acting ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of research and development activities.
- explore, where applicable, education and career opportunities in research and development.
- organise and develop entrepreneurial opportunities through technical research, development and/or managerial skills.

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**Name of programme:****MPhil (Engineering Management) Lectured**

**Admission requirements:** A Baccalaureus Technologiae, Engineering or an equivalent qualification of an equivalent standard. With 1.5 years appropriate experience.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Prof JHC Pretorius / Tel: 011 559 3824 / Email: ginar@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an intellectual with advanced abilities in applying fundamental Engineering Management Sciences and design, and synthesis and related interdisciplinary principles to specific management systems problems of society at large. One of the main objectives in this process is to develop an advanced capability to do independent systems engineering and management research of inter/intra disciplinary nature. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering Management research and development problems creatively and innovatively

- by applying relevant interdisciplinary knowledge in the chosen field of research.
- plan and manage Engineering Management research projects demonstrating an underlying interdisciplinary knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of interdisciplinary research.
- organise and manage him/herself and his/her activities responsibly, effectively and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable levels of investigations, research and/or experiments by applying appropriate theories and methodologies and perform appropriate data analysis and interpretation.
- communicate effectively, both orally and in writing, with specifically research audiences and the community at large in so far as they are affected by the research using appropriate data analysis and interpretation.
- use and assess appropriate Engineering Management research methods, skills, tools, technology and information technology effectively and critically in research and development practice and show an understanding and a willingness to accept responsibility for the impact that interdisciplinary research and development activities have on society and the environment.
- perform systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of interdisciplinary research.
- employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the interdisciplinary field.
- participate as a responsible citizen in the life of local, national and global communities by acting ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of engineering management research and development activities.
- explore, where applicable, education and career opportunities in Engineering Management research and development.
- organise and develop entrepreneurial opportunities through interdisciplinary research, development and/or managerial skills.

**Name of programme:****MPhil (Engineering Management) Research Based**

**Admission requirements:** A Baccalaureus Technologiae, Engineering or an equivalent qualification of an equivalent standard. With 1.5 years appropriate experience.

**Duration of programme:**

Full-time: 1 year / Part-time: 2 years

**Contact details:**

Name: Prof JHC Pretorius / Tel: 011 559 3824 / Email: ginar@uj.ac.za

**Brief description of programme:** Purpose of the qualification: The aim of the qualification is to develop an intellectual with advanced abilities in applying fundamental Engineering Management Sciences and design, and synthesis and related interdisciplinary principles to specific management systems problems of society at large. One of the main objectives in this process is to develop an advanced capability to do independent systems engineering and management research of inter/intra disciplinary nature. It also enforces an approach to lifelong learning.

**Qualification outcomes:** The student is able to:

- identify, assess, formulate, interpret, analyse and solve Engineering Management research and development problems creatively and innovatively by applying relevant interdisciplinary knowledge in the chosen field of research.
- plan and manage Engineering Management research projects demonstrating an underlying interdisciplinary knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) research and development in the chosen field of research practice.
- work effectively individually or with others as a member of a team, group, organisation, community or in multidisciplinary environments in the chosen field of interdisciplinary research.
- organise and manage him/herself and his/her activities responsibly, effectively and ethically and to take responsibility within his/her own limits of competence and to exercise judgement commensurate with knowledge and expertise, pertaining to the field of research.
- plan and conduct applicable level of investigations, research and/or experiments by applying appropriate theories and methodologies and perform appropriate data analysis and interpretation.
- communicate effectively, both orally and in writing, with specifically research audiences and the community at large in so far as they are affected by the research using appropriate data analysis and interpretation.

- use and assess appropriate Engineering Management research methods, skills, tools, technology and information technology effectively and critically in research and development practice and show an understanding and a willingness to accept responsibility for the impact that interdisciplinary research and development activities have on society and the environment.
- perform systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impacts and benefits where applicable in the chosen field of interdisciplinary research.
- employ various learning strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the interdisciplinary field.
- participate as a responsible citizen in the life of local, national and global communities by acting ethically in the chosen field of research.
- demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of Engineering Management research and development activities.
- explore, where applicable, education and career opportunities in Engineering Management research and development.
- organise and develop entrepreneurial opportunities through interdisciplinary research, development and/or managerial skills.

## DOCTORAL TECHNOLOGY DEGREE PROGRAMMES (DTech)

**Name of programme:****DTech (Engineering: Mechanical)**

**Admission requirements:** An appropriate Magister Technologiae or an equivalent qualification at an equivalent standard as determined by a Status Committee.

Students are selected on academic merit and approved field of study.

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: This qualification is intended for persons who will make a significant and original contribution to knowledge in a specialised area of technology. They will have a high level of overall knowledge in that specialised area ranging from fundamental concepts to advanced theoretical or applied knowledge.

**Qualification outcomes:** The student is able to:

- identify and solve problems in which responses display that responsible decisions, using critical and creative thinking, have been made.
- collect, organise, analyse and critically evaluate information.



- work effectively with others.
- reflect on and explore a variety of strategies to learn more effectively.
- communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written presentation.

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**Name of programme:****DTech (Extraction Metallurgy)**

**Admission requirements:** An appropriate Magister Technologiae or an equivalent qualification at an equivalent standard.

Students are selected on academic merit and approved field of study.

**Duration of programme:**

Full-time: 2 years / Part-time: 3 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

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**Name of programme:****DTech (Engineering Metallurgy)**

**Admission requirements:** An appropriate Magister Technologiae or an equivalent qualification at an equivalent standard.

Students are selected on academic merit and approved field of study.

**Duration of programme:**

Full-time: 2 years / Part-time: 3 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Brief description of programme:** Purpose of the qualification: A qualifying learner at this level is competent in doing original research and development at specialist level in Metallurgical Engineering, thus contributing to the research and development needs and knowledge base of the metallurgical industry and mining community. The qualified person will be able to register with ECSA as Professional Technologist.

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## DOCTORAL DEGREE PROGRAMMES (PhD)

**Name of programme:****PhD in Engineering**

Applicants can apply for the PhD Engineering in the following specialisations:

**Chemical Engineering**

**Civil Engineering**

**Electrical and Electronic Engineering**

**Engineering Management****Mechanical Engineering****Metallurgy Engineering****Operations Management**

**Admission requirements and selection criteria:** An approved Master's degree in Engineering or a similar approved degree at Master's level or NQF level 9 equivalent. Final admission to the programme will only be granted upon successful presentation of a research seminar six months after enrollment. Research topics must also be accepted and approved by the supervisors in the Faculty and finally by the Senate or Executive Committee of the Senate of the University.

**Duration of programme:**

Full-time: 2 years / Part-time: 3 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

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**Name of programme:****PhD in Quantity Surveying**

**Purpose of the qualification:** Quantity Surveyors are major players in the construction industry as they play a significant part in the management of construction business. The increasing complexity of the construction process requires high levels of engineering and management skills. Today, the planning, designing, costing, managing, building, and maintenance of facilities, require a higher level of sophistication and expertise than ever before. Many capable professionals and academics are unable to fill high level managerial appointments in the construction industry because of a lack of management education and experience. The purpose of the programme is to develop an intellectual with the advanced ability to produce quantity surveying research that seeks to add knowledge and growth to this particular sector. One of the main objectives in this process is to develop an advanced capability to conduct inter-disciplinary quantity surveying research of an original nature. It will also promote a lifelong learning approach, as well as an aptitude for training other students in similar fields.

**Admission requirements:** An approved Master's degree in Quantity Surveying (Construction Economics) or any Built Environment discipline or a similar approved degree at Master's level.

**Duration of programme:**

Full-time: 2 years / Part-time: 3 years

**Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Qualification outcomes:** The student should be able to:

- Analyze and solve Quantity Surveying (Construction Economics) research/

development problems of an original nature creatively and innovatively by applying relevant advanced fundamental knowledge of Construction Management Sciences in the chosen field of research.

- Plan and manage research projects, demonstrating fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) construction research/development/management in the chosen field of research practice.
- Plan and conduct advanced inter-disciplinary investigations, research and/or experiments of an original nature by applying or developing appropriate theories and methodologies, and perform appropriate data analysis and interpretation.
- Communicate effectively, both orally and in writing, with specific research institutions, audiences and the community at large, in so far as they are affected by the research, using appropriate structure, style and graphical support.
- Apply and assess appropriate advanced inter-disciplinary research methods, skills, tools and information technology effectively and critically in Quantity Surveying (Construction Economics) research/development practice, and show an understanding and a willingness to accept responsibility for the impact of research/development activities on society and the environment.
- Apply a synthesis of components, systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impact and benefits, where applicable, in the chosen field of inter-disciplinary research.
- Demonstrate and provide guidance where applicable and demonstrate cultural and aesthetic sensitivity across a range of social contexts in the execution of Quantity Surveying (Construction Economics) research/development activities.

## **Name of programme:**

### **PhD in Construction Management**

**Purpose of the qualification:** Construction management is a holistically-developed built environment discipline in that the related tertiary education addresses three main streams, namely management, economics and science and technology. This empowers construction management graduates to manage the business of construction and projects (the physical process), as construction managers. Furthermore, construction management is the 'gateway' qualification for construction project management, which is the management of projects from conception to completion on behalf of a client, including design delivery, integration of design and construction, and the overseeing of construction. Expertise in this area is therefore imperative for the infrastructural development of South Africa and the African continent. The purpose of the programme is to develop an intellectual with advanced abilities in applying construction engineering management with other related inter-disciplinary principles, in order to address construction management

related problems within the sector. One of the main objectives in this process is to develop an advanced capability to conduct inter-disciplinary construction engineering management research of an original nature. It also aims to promote a lifelong learning approach, as well as an aptitude for training other students in similar fields.

**Admission requirements:** An approved Master's degree in Construction Management or any Built Environment discipline or a similar approved degree at Master's level.

## **Duration of programme:**

Full-time: 2 years / Part-time: 3 years

## **Contact details:**

Name: Ms Dudu Kanyi / Tel: 011 559 2109 / Email: febehd@uj.ac.za

**Qualification outcomes:** The student should be able to:

- Analyse and solve construction engineering management research/development problems of an original nature creatively and innovatively by applying relevant advanced fundamental knowledge of Construction Management Sciences in the chosen field of research.
- Plan and manage research projects, demonstrating fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) construction research/development/management in the chosen field of research practice.
- Plan and conduct advanced inter-disciplinary investigations, research and/or experiments of an original nature by applying or developing appropriate theories and methodologies, and perform appropriate data analysis and interpretation.
- Communicate effectively, both orally and in writing, with specific research institutions, audiences and the community at large, in so far as they are affected by the research, using appropriate structure, style and graphical support.
- Apply and assess appropriate advanced inter-disciplinary research methods, skills, tools and information technology effectively and critically in construction engineering management research/development practice, and show an understanding and a willingness to accept responsibility for the impact of research/development activities on society and the environment.
- Perform synthesis of components, systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impact and benefits, where applicable, in the chosen field of inter-disciplinary research.
- Demonstrate cultural and aesthetic sensitivity across a range of social contexts in the execution of construction engineering management research/development activities.