

TRINITY INTERNATIONAL UNIVERSITY

presents the

GENERAL AND AVAILABLE DEGREE PROSPECTUS

for the

B Sc (Hons) in Forensic Science

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1. GENERAL INFORMATION

ABOUT THE DEGREE PROGRAMS

Specially prepared by

**Professor Dr J Potgieter
Course Director
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These undergraduate and postgraduate degree courses have been specially prepared for distance learning purposes and are intended to fill the special needs for the university. Students will be entitled to receive credit for life-work experience based on the norms and standards set by CAEL and previously completed studies at recognized academic institutions under the University's accreditation for prior learning program.

Undergraduate degree programs are designed for students who wish to pursue a scientific related program in either the scientific or managerial science fields of endeavor.

These programs are designed and have been compiled from sources and materials NOT RELATED to any existing degree programs offered anywhere. The textbooks selected and syllabuses are based according to the latest materials, developments, technologies and systems applicable in the field of endeavor.

All courses are textbook related and suitable assignments and examinations are set for each course to be completed by students. Where applicable, fieldwork and practical work will be prescribed. Theses and assignments must follow the usual format and structure requirements set by each faculty.

2. DEGREE SUPERVISORS

Under the guidance of Prof Dr J Potgieter PhD (Eng), PhD (Aviation Science), D Lit, D Sc (hc), PhD (Bus Admin), D Eng (Industrial Eng) the following programs are supervised:

B Sc (Hons) Industrial Engineering (Electrical and Mechanical Majors)
B Sc (Hons) Agricultural Science
B Sc (Hons) Agricultural Engineering
B Sc (Hons) Agricultural Management
B Sc (Hons) Hydrological Science
B Sc (Hons) Mechatronics Engineering
B Sc Forensic Science
M Sc Forensic Science

Under the guidance of Prof S M Keong PhD(Eng), PhD (Eng Mgt), D Sc (Concrete), M Sc (Civil Eng), M Sc (Geot Eng), C Eng, MICE, MIEE, MCIOB, FBEng, FSE, C Math the following programs are supervised:

B Sc (Hons) Structural Engineering
B Sc (Hons) Concrete Technology
B Sc (Hons) Soil Science Technology

Under the guidance of Professor Dr S Grima B Com, B Com (Hons), M Sc (Fin Man), M Sc (Accountancy), PhD (Finance), FIPFM, FDTMS, FIAB, AFA the following program is supervised:

M Sc Financial Management

3. ENROLLMENT INFORMATION AND COURSE FEES

Here are the fees for the available degrees:

Degree	Cost
Associate Degree (as separate degree or part of Bachelors Degree):	\$1800-00 USD
Bachelors Degree (excluding associate degree)	\$1800-00 USD
Bachelors Degree (including Associate Degree)	\$3600-00 USD
Masters Degree	\$2600-00 USD
PhD (in any approved field of research)	\$3600-00 USD

Textbooks are NOT included and are separately quoted. Costs depend on the nature of the program, exemption granted as well as courier/transportation and importation/tax fees applicable to the student's country of residence.

PAYMENT METHODS

We accept: Personal checks, bank drafts, electronic transfer and credit card payments. Payment by means of installments must be arranged.

ENROLLMENT DETAILS AND ADDRESS

Internet enrollments are possible on our website at: www.trinityinternationalcu.com by following the instructions. Applicable fees are payable by means of a personal check, draft, direct transfer or credit card payments. We accept installments and any approved arrangements for payment of fees.

5. COURSE STRUCTURE

The programs have been structured to ensure they are suitable to any organization or person anywhere in the world. Students will be able to commence with their studies any time of the year. The programs are structured to allow a) students without a high school diploma or b) mature students to study up to the highest degree level. Students without the usual entrance level qualification, but with acceptable basic knowledge are welcome to apply and will be able to study their intended program from first principles. Bridging courses will be prescribed to ensure that the student has the required level of knowledge. Many introductory courses have enough scope and are of such nature, which allows students to advance up to degree level and prepare students for more advanced level work.

OVERVIEW

Objective

The programs are designed for students who wish to study their field of interest most suitable to them. The course programs are suitable for students anywhere in the world and will be complimented with fieldwork, practical requirements and coursework as well as assignments most suitable to the needs of each student. Where applicable, courses will be adapted for special needs on topics, study areas and research areas not included as listed in the various programs. These programs are suitable for distance education or campus learning centers approved by the Course Director. The purpose is also to enable students to acquire the knowledge and theoretical understanding with skills to equip them to advance from basic principles to the higher level in their fields of study. We further strive to provide the mature candidate whom has gained acceptable training, education and experience, an acceptable method to advance to the higher degree levels in his/her career. Our third aim is to ensure that candidates develop their professional careers and gain acceptance through membership or certification or by joining international or local professional institutions.

ENTRY METHOD (as indicated on the [Admissions Page](#))

- A suitable school level certificate (to advance through studies to senior school certificate level), or
- A senior school leaving certificate/diploma for degree candidates
- Mature students with suitable training and experience

EXEMPTIONS (as indicated on the [Admissions Page](#))

Students with completed courses, certificates, diplomas or degrees will be considered for exemption. Partial exemption may be granted where applicable. Additional coursework will be prescribed, to complete the outstanding coursework in question in order to gain full credit for each course where applicable.

DURATION

No time limit is set but as a guide the usual durations are:

Associate degrees - from one to two years

Bachelor's degree programs - from two to four years

Master's degree programs - from one to two years

Doctorates - from two to three years, depending on the amount of work involved.

LEARNING METHODS

- Coursework requirements assignments
- Textbook related studies, notes and articles,
- Fieldwork, research, practical work assignments
- Learning sources such as libraries, Internet and dedicated learning sources

METHOD OF ASSESSMENT

Assignments, projects, independent projects, examinations and independent theses or projects and dissertations as applicable to assess student professionalism.

TEXTBOOKS

Textbooks are prescribed for each course. Where applicable additional learning sources available on the Internet will be utilized. The Course Director will assist students with the arrangement and ordering of textbooks. An estimate will be given to students giving the cost for the textbooks related to his/her studies. Students are responsible for additional study aids, notepads and any other equipment required to study efficiently. A complete reading list will be given for each degree programs upon successful admission to your program of choice.

6. STUDENT DOCUMENTATION

All students at all degree levels will receive the following:

- Information about the required textbooks.
 - Study instructions and assignments.
 - Coursework and fieldwork as required.
 - Syllabus details for each course.
 - Student handbook – basic study requirements and information
 - Student guidelines on how to prepare assignments, theses, proposals and dissertations.
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8. DEGREE COURSES

B Sc (Hons) IN FORENSIC SCIENCE

FSR/COM1	Business Communication (i) Communication Skills (ii) Writing Skills
FSR/CBR1	Scientific Mathematics (i) Calculus (ii) Statistics
FSR03	Problem Solving and Critical Thinking
FSR04	Introduction to Applied Science (i) Mechanics and Heat (ii) Electricity and Magnetism
FSR/CBR3	Chemistry (general chemistry)
FSR05	Environmental Science
FSR06	Introduction to Forensic Science
FSR/MNM03	Introduction to Computers
FSR08	Expert Witnessing
FSR09	Applied Forensic Statistics
FSR10	Ethics in Forensics
FSR11	Forensic Digital Imaging
FSR17	Forensic Radiology
FSR12	Forensic Evidence
FSR13	Environmental Forensic Analysis
FSR14	Forensic Dentistry Analysis
FSR15	Human Remains Forensic Analysis
FSR16	Forensic DNA Analysis
FSR18	Hair Forensic Analysis

9. DEGREE SYLLABUS

9.1 GENERAL INFORMATION

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GENERAL NOTES AND INFORMATION APPLICABLE TO EACH COURSE

Pre-requisites

Will be stated if required, but as a guide the structure of the courses and the sequence determine the basic requirements in each case. Usually, mathematics, physics and chemistry are the major tools and form the basic in each case for each program. This is followed by courses required in each case to fulfil the needs for successful completion during the entire study process.

Number of Credits: 3

Hours Assigned:

2 hours/week x 14 weeks or the equivalent via distance learning = 28 hours

Laboratory/practical:

2 hours/week x 7 weeks or its equivalent via distance learning = 14 hours

Total = 42 hours

Contents:

Each course contents are listed below and the general notes and information is applicable to each program.

Objectives A: The subject syllabus provide students with -

- 1 The basic skills for analyzing and improving working methods, procedures and systems in the context of the workstation and a department taking into account ergonomic considerations so that they are able to carry out a production management project in a company for the purpose of management and productivity improvement.
- 2 Skills in the use of compilation of work measurement data and to have a basic understanding of the techniques and importance of qualifying work in manufacturing and service industries hence to be able to measure the work content
- 3 A working knowledge of the techniques of facilities layout and their interaction with the material handling system (where relevant), to enable them to evaluate an existing production system and recommend improvements and/or to plan a new system.

Objectives B: The subject aims to -

- 1 Provide students with an understanding of the basic principles and techniques involved in management of people and engineering in the production of goods and services.
- 2 Enable students to appreciate the importance of quality management.
- 3 Ensure students are aware of the effects on engineering organizations of the factors in the environment within which they operate.

Objectives C: Provide students with -

- 1 The ability to perform research, use the knowledge obtained from each course of the program and to compile and sort the information obtained.
- 2 To be able to use the knowledge obtained to write the research project and to use proper methods, language and techniques to complete the task. Be able to use computer packages and software for the preparation of research projects and reports.

Teaching and Learning Approach:

A mixture of lectures, tutorial exercises and case studies will be used to deliver the various topics in the subject. Some will be covered in a problem-based format where this enhances the learning objectives. Others will be covered through directed study in order to enhance the student's ability of what to learn. Some case studies, largely based on consultancy experience, will be used to integrate these topics and thus demonstrate to students how the various techniques are inter-related and how they apply in real situations.

Assessment:

Coursework - 40%
Examination - 60%

Textbooks and References:

Listed separately for convenience and reference.

9.2 SPECIFIC DEGREE SYLLABUS

B Sc (Hons) IN FORENSIC SCIENCE

FSR/COM1 - Business Communication

Research methods, Libraries and Internet, Referencing, Criteria and plagiarism, Essays and articles, Letters at work, Business proposals and business plans, Reports, Academic proposals and theses, Presentation skills for individuals and groups, Illustrations – graphics and power point.

FSR/CBR1 - Scientific Mathematics

Complex numbers, Hyperbolic functions, Determinants, Vectors, Differentiation, Differentiation applications, Partial differentiation, Curves and curve fitting, Series, Integration, Integration applications, Approximate integration, Polar coOrdinates, Multiple integrals, First order differential equations, Second order differential equations, Operator D methods, Statistics.

FSR03 - Problem Solving and Critical Thinking

Introduction; Planning; Understanding attention and working memory; Learning and remembering; Teaching and thinking; Selecting references; Lecturing and discussions; Writing assignments; Test construction; Ethical issues; Special situations; Evaluation and improving learning; References.

FSR04 - Introduction to Applied Science

Part I: Introduction and mathematical concepts, Kinetics in one dimension, Kinetics in two dimensions, Forces and Newton's laws of motion, Work and energy, Impulse and momentum, Rotational dynamics, Rotational kinetics, Simple and harmonic motion and elasticity, Fluids, Temperature and heat, The transfer of heat, The ideal gas law and kinetic theory, Thermodynamics, Waves and sound, the principle of linear superposition and interference phenomena

Part II: Electric force and electric fields, Electric potential energy, Electric circuits, Magnetic forces and magnetic fields, Electromagnetic induction, Alternating current circuits, Electromagnetic waves, The reflection of light, Mirrors, The refraction of light, Lenses and optical instruments, Interference and the wave nature of light, Special relativity, Particles and waves, The nature of the atom, Nuclear physics and radioactivity, Ionizing radiation, Nuclear energy and elementary principles.

FSR/CBR3 - Chemistry (general chemistry)

Basic principles; Atomic structure and chemical bonding; reactions in aqueous medium; Precipitation and complex formation and redox; Gases; Thermo-chemistry; Engineering applications of chemical equilibrium and kinetics in corrosion; Combustion; Welding and water treatment; Inorganic and organic polymers.

FSR05 - Environmental Science

Environmental sciences and sustainable development; The global environmental debate; Environmental policies and policy processes; Environmental economics in environmental management; Population; Vulnerability and criticality; The global warming debate; Coastal management; River processes and management; GIS in environmental science; Groundwater pollution and protection; Marine and estuarine pollution; Urban air pollution and health; Environmental risk management; Energy politics; Preventing disease; Managing global commons.

FSR06 - Introduction to Forensic Science

Introduction; Historical development of forensic sciences; Criminalistics; Forensic psychiatry; Coordination of forensic activities and use of court; Legal medicine and jurisprudence; Forensic toxicology; Questioned documents; Bloodstain pattern interpretation; Serology and DNA typing; Forensic odontology; Forensic anthropology; References.

FSR/MNM03 - Introduction to Computers

Problems and problem solving; General concepts and tools; Arithmetic and logical operators; Developing an algorithm to solve a problem; Modularization; Functions and procedures; Arrays; File processing; Reports and control breaks; Processing the date; Introduction to object-oriented programming.

Introduction, Fundamental data types, Objects decisions, Functions, Iteration, Testing and debugging, Classes, Vectors and arrays, Pointers, Streams, Inheritance, Object oriented design, Recursion, Algorithms, An introduction to data structures, Advanced C++ language, Coding guidelines, C++ language summary, Java.

FSR08 - Expert Witnessing

Introduction; Developing strategies; Fees, contracts and marketing; Discovery; Expert opinions under daubert; The deposition; Daubert challenge; Preparation for trial; Giving testimony at trial; Communication; The engineers nightmare – case studies; The expert as a witness; The lawyer and the verdict; The future of expert witnessing; References.

FSR09 - Applied Forensic Statistics

Probability; Populations and samples; Weight of evidence and the Bayesian likelihood ratio; Transfer evidence; Application of statistics to particular areas of forensic science; Knowledge based systems; Quality based systems; References.

FSR10 - Ethics in Forensics

Professionalism and ethics: why should professional ethics be important; The importance of professional ethics to science practitioners; Development of a code of conduct and code of ethics for forensic science; Application of codes and ethics; How ethical requirements impact the daily work of a forensic scientist; Ethical dilemmas and their resolution; References.

FSR11 - Forensic Digital Imaging

Introduction; Digital cameras and forensic imaging; Uses of digital imagery; Film as a light sensor; Tonal and spatial resolution and their consequences; Color responses; Digital photography; Maintaining chain-of-control with digital images; Digital video; Scanners; Taking good pictures; Presenting pictures in the courtroom; Processing digital images; Nonrandom noise; Adjustment size; Spatial distortions; Enhancement of detail; Sharpening of color; Less common processing methods; Color separation and filtering; Frequency space; High and low pass filtering, band pass filtering and periodic noise; De-convolution and removal of system defects; \measuring image resolution; Tonal resolution; Detecting compression and forgeries; Maintaining records; Identification; The image chain; Surveillance video cameras; Recoding and playback problems; Pixels and resolution; Noise and tonal resolution and other shortcomings; Image restoration; Recognition and identification; Identifying faces and by DNA; Misdirection and mistakes; Witnessing and legal procedures.

FSR17 - Forensic Radiology

Introduction to forensic radiology; Definitions in forensic radiology; Forensic radiology in historical perspective; The scope of forensic radiology; Identification; Identification of the dead; Anthropological parameters; Applications in dentistry; Radiographic techniques in bite mark analysis – identification of the perpetrator; Radiological identification of individual remains; Radiology in mass casualty situations; Gunshot wounds; Pitfalls in the radiology of

gunshot wounds; Radiology in nonviolent crimes; Smuggling; Larceny; The radiology of fakes and forgery in art; Radiology of abuse; Child abuse; Spousal abuse and abuse of the aged; Civil rights abuse – torture and terrorism; Research and references.

FSR12 - Forensic Evidence

Science, forensics and evidences; Science and the criminal law; Fiber analysis; Ballistics and tool marks; Soil, glass and paint analysis; Footprints and tire impressions; Fingerprints; Blood spatter analysis; DNA analysis; Forensic anthropology and entomology; References.

FSR13 - Environmental Forensic Analysis

Part I: Introduction; Solvents - Chronology and use of chlorinated solvents; Chemistry and properties of chlorinated solvents; Transport of chlorinated solvents through soil; Impact of co-solvency or transport through soil; Transport of vapors in soil; Transport through the capillary fringe; Transport in groundwater; Chemistry and transport of petroleum hydrocarbons – Chemistry of crude oil; Chemistry of refined products; Chemical reactions in the vadose zone; Overview of transport through the unsaturated vadose zone; Hydrocarbon interactions at the capillary fringe; Transport in groundwater; Identification of biased environmental data – Geologic characterization; Interpretation of geologic information; Soil collection for chemical analysis; Groundwater characterization; Soil vapor analysis; Analytical methods; Forensic techniques used in environmental litigation – Aerial photography

Part II: Underground storage tank corrosion models; Inventory reconciliation; Commercial availability of a chemical; Chemicals and formations unique to a manufacturing process or activity; Petroleum refinery throughput analysis; Chemical identification of petroleum hydrocarbons; Radioactive isotope dating; Chemical and biological degradation models; Contaminant transport modeling – Liquid transport through pavement; Vapor transport through pavement; Contaminant transport in soil; Contaminant transport in groundwater; Application of groundwater modeling in environmental litigation; Forensic review of environmental trial exhibits – Exaggerated vertical and horizontal scales; Selective data presentation; Data contouring; References.

FSR14 - Forensic Dentistry Analysis

Scientific methods of identification; DNA identification; Issues regarding scientific testing; Forensic anthropology; Buried crime scene evidence – The application of forensic geotaphonomy in forensic archeology; Forensic photography in dentistry; Bite mark techniques and terminology; Case studies; Mass disasters; Mass disaster experiences and forensic nuggets; Civil and criminal case involvement – dealing with attorneys; Courtroom procedures; References.

FSR15 - Human Remains Forensic Analysis

Introduction to forensic taphonomy
Modification of soft tissue, bone and associated materials – Overview
Scavenged remains – Overview
Buried and protected remains – Overview
Remains in water – Overview
Conclusions and references.

FSR16 - Forensic DNA Analysis

Introduction; The nature of physical evidence; The collection and preservation of physical evidence; History of DNA typing; The scientific basis of DNA typing; An overview of forensic DNA typing; Procedures for forensic DNA analysis; Interpretation of DNA typing results; Assessing the strength of the evidence; The DNA databank; Quality assurance; Admissibility standards – Science on trial in the courtroom; References.

FSR18 - Hair Forensic Analysis

Physiology and growth of human hair; Forensic and microscopic examination of human hair; DNA derived from human hair for forensic application; Drug analysis using hair; Forensic examination for cosmetic treatment; Evidential hair examination; case studies in hair forensics.