Universiteit van Pretoria Jaarboek 2017

BIngHons Rekenaaringenieurswese (12240214)

Duur van studie	1 jaar
Totale krediete	128

Programinligting

Die leergang word in oorleg met die betrokke departementshoofde bepaal. 'n Student moet in modules met 'n totaal van minstens 128 krediete slaag.

Die graad word slegs op grond van eksamens toegeken.

Toelatingsvereistes

Behoudens die bepalings van Reg. G.1.3 en G.54 word ‘n BIng-graad of ‘n gelykwaardige kwalifikasie vir toelating vereis.

Ander programspesifieke inligting

Studente mag 32 krediete se modules uit 'n ander spesialisrigting of departement neem, met toestemming van die Koördineerder: Nagraadse studie.

Eksamens en slaagvereistes

i. Die eksamen in elke module wat die student volg, word in die eerste normale eksamentydperk na afsluiting van klasse (dit wil sê Oktober/November of Mei/Junie) afgeneem.
ii. 'n Student vir die honneursgraad moet sy of haar studie in die geval van voltydse studente binne twee jaar, en in die geval van na-uurse studente, binne drie jaar na eerste registrasie vir die graad voltooi, met dien verstande dat die Dekaan, op aanbeveling van die departementshoof, in buitengewone omstandighede 'n vasgestelde beperkte verlenging van die tydperk kan goedkeur.
iii. 'n Student moet in elke module minstens 50% in die eksamen behaal waar 'n semester- of jaarpunt nie vereis word nie. 'n Module mag net een maal herhaal word.
iv. In gevalle waar daar wel 'n semester- of jaarpunt toegeken word, word 'n minimum eksamenpunt van 40% en 'n finale punt van 50% vereis.
v. Geen her- of spesiale eksamens word op nagraadse vlak toegestaan nie.

Slaag met lof

'n Student slaag met lof as hy of sy 'n geweegde gemiddelde van minstens 75% behaal het in die eerste 128 krediete waarvoor geregistreer is (modules wat betyds gestaak is, uitgesluit). Indien die student

enige module druip (modules wat betyds gestaak is, uitgesluit), kan die graad nie met lof behaal word nie.

Kurrikulum: Finale jaar

Minimum krediete: 128

Kernmodules

Koordlose sensornetwerke 732 (EKS 732)

Modulekrediete	32.00
Voorvereistes	Rekenaarnetwerke ERN 780
Kontaktyd	32 kontakure per semester
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

WSN consist of individual nodes interacting with their environment by sensing or controlling physical parameters; these nodes have to collaborate (using wireless communication) to fulfil their tasks. The course can be structured in two parts: architectures covering single node and network architectures, and communication protocols focusing on algorithms and protocols relevant to wireless sensor networks. The latter include the physical layer, MAC protocols, link-layer, naming and addressing, time synchronisation, localisation and positioning, topology control, routing protocols, data-centric and content-based networking, transport layer an QoS, and advanced application support (e.g. security).

Rekenaarnetwerke 780 (ERN 780)

Modulekrediete	32.00
Voorvereistes	Geen voorvereistes.
Kontaktyd	32 kontakure per semester
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

Review of computer networks infrastructure: The review will cover elementary concepts in computer networks; covering data communications, wide area networks, and local area networks.
Networking protocols: This section will explore both the architectural principles and mechanisms required for the exchange of data among computers, workstations, servers, and other data processing devices. Much of the material in this part relates to the TCP/IP protocol suite. Recent developments and state-of-art issues will also be focused upon.
Applications, service models and convergence of networks: This section will look at the application layer and explore various service models in the context of convergence. Students will be introduced to various Next Generation Networks technologies and issues.
Modelling and simulation: This section will cover research issues in computer networks. Students will be introduced to modelling, simulation techniques and tools.

Intelligente stelsels 732 (EAI 732)

Modulekrediete	32.00
Voorvereistes	Geen voorvereistes.
Kontaktyd	10 lesings per week
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

This module provides the theoretical background necessary to understand, research and develop real-world software and hardware systems that incorporate and exhibit intelligent behaviour. The module incorporates advanced theory from fields such as Artificial Intelligence, Computational Intelligence, Machine Learning, Pattern Recognition and Signal Processing. Core topics of the module include: Bayesian Theory, Neural Networks, Kernel Methods, Graphic Models, and Numerical Bayesian Methods.

Hernieubare energie 732 (EGH 732)

Modulekrediete	32.00
Kontaktyd	32 kontakure per semester
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

This course will cover various renewable energy technologies including Wind, Solar Photovoltaic systems, Distributed generation and Hybrid power system.

Elektroniese verdediging - elektroniese teenmaatreëls 780 (ELB 780)

Modulekrediete	32.00
Voorvereistes	Geen voorvereistes.
Kontaktyd	10 lesings per week
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

Radar, including aspects such as: radar frequency bands and their characteristics, radar types (eg tracking vs search radar), the radar range equation, radar cross-section (RCS), target characteristics such as scintillation and glint, pulse compression, coherent and non-coherent integration (eg Doppler processing), range and Doppler ambiquities, target tracking including simple tracking filters and angle-tracking techniques (eg monopulse), high range-resolution (HRR) techniques, and environmental effects such as atmospheric attenuation and multipath. Electronic attack (EA) - also referred to as jamming or electronic countermeasure (ECM) - including the relationship between good system design and EP, and basic EP techniques to counter the EA techniques listed above.

Elektroniese verdediging - elektroniese ondersteuning 781 (ELB 781)

Modulekrediete	32.00
Kontaktyd	32 kontakure per semester
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

The role of electronic support (ES) receivers from tactical and strategic perspectives. ES system architectures including analogue and digital receivers. The following topics will be considered: signal detection, parameter estimation including direction finding (DF) angle of arrival (AoA) estimation and pulse repitition interval (PRI) tracking, emitter classification and low probability of detection (LPD) and low probability of intercept (LPI) techniques to counter ES receivers.

Inleiding tot navorsing 732 (EIN 732)

Modulekrediete	32.00
Voorvereistes	Geen voorvereistes.
Kontaktyd	16 kontakure per semester
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re

Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie is 'n verpligte module.

*Hierdie inligting is slegs in Engels beskikbaar.

The aim of this module is to teach students to critically evaluate research literature, including conference papers and journal articles, in order to determine the current state of knowledge in a particular specialist area. It will also provide students with the principles of research to enable them to conduct research and prepare an original project in their particular specialist area.

Navorsingsprojek: Ontwerp en laboratorium 733 (EPT 733)

Modulekrediete	32.00
Voorvereistes	Geen voorvereistes.
Kontaktyd	10 lesings per week
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

This module will include extensive laboratory experiments to test the principles and possible solutions of the proposed M Eng research project and will include inter alia the following. These will include hardware and/or software experiments:
(i) Introduction to instrumentation and measuring techniques in general and specifically as applied in the field of research.
(ii) Structured laboratory work to introduce the specific problem investigated for the research undertaken.
(iii) Structured laboratory work to test the proposed solution for the problem addressed.
(iv) Confirmation experiments.

Navorsingsprojek: Teorie 732 (EPT 732)

Modulekrediete	32.00
Voorvereistes	Geen voorvereistes.
Kontaktyd	10 lesings per week
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

*Hierdie inligting is slegs in Engels beskikbaar.

This module will cover the essential theoretical background of the student's proposed M Eng topic and include inter alia the following:
(i) Field definition and descriptions
(ii) In-depth study into background and theory relevant to the problem to be addressed
(iii) Problem definition and description
(iv) Mathematical simulations of the problem

Advanced topics in intelligent systems 733 (EAI 733)

Modulekrediete	32.00
Voorvereistes	EAI 732
Kontaktyd	10 lesings per week
Onderrigtaal	Module word in Engels aangebied
Akademiese organisasie	Elektriese, Elektroniese en Re
Aanbiedingstydperk	Semester 1 of Semester 2

Module-inhoud

The aim of the module is to augment the general background provided by the EAI 732 module with the specific theoretical background required for MEng. The module will, depending on the intended research field of the student, incorporate advanced theory from fields such as: Digital Image Processing, Computer and Robotic Vision, Probabilistic Robotics, Data Fusion, Hardware and Software Parallel Processing, Real-Time and Reactive Systems.