FACULTY OF
ENGINEERING &
THE BUILT ENVIRONMENT

CPD
CONTINUING PROFESSIONAL DEVELOPMENT

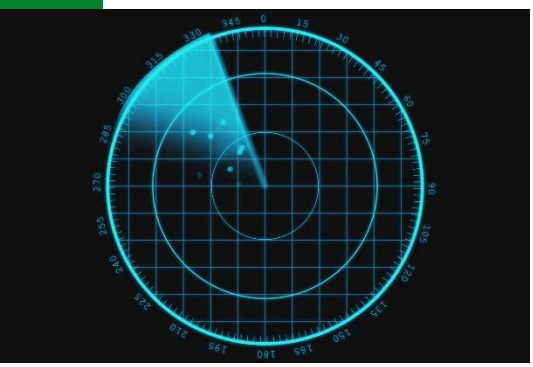
Dept. of Electrical Engineering | Masters module | CPD course

Microwave Components and Antennas

4 – 8 August 2025

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Introduction



The Master's Programme

To address the growing need for skilled engineers and scientists in the challenging fields of Radar and Electronic Defence, the University of Cape Town (UCT) and the Council of Science and Industrial Research (CSIR), in conjunction with international partners and industrial sponsors, including the King Abdulaziz City for Science and Technology (KACST), have established a master's degree in engineering (MSc, Eng and MEng) with specialisation in Radar and Electronic Defence. The Programme is hosted in Cape Town, South Africa and had its first intake of students in February 2011.

Each course typically contains a lecture component of 5 full days, followed by weekly online seminars and tasks culminating in a written examination, over a five-week period after the first, intensive lecture session. The programme is designed to facilitate students that cannot be resident in Cape Town for the full duration to complete all courses, by using distance learning techniques during the follow up period after each course (after the one-week intensive lecture period). All students will, however, must be present in Cape Town for the one-week lecture period for each course.

For further information on the master's programme please visit:
http://www.radarmasters.uct.ac.za/

Degree Structure

A master's degree requires students to pass 180 credits of coursework and dissertation, with one credit requiring about 10 hours of work. Thus, the average time required to complete a master's degree is about 1800 hours of work.

The master's degree in Radar is offered with three different degree structures:

1. Professional Taught Master's Degree (MEng Radar):
   This master's degree consists of 6 x 20 credit courses and a 60-credit mini dissertation. There are two core courses, viz. Introduction to Radar and Mathematics, plus four more specialized radar courses. We also offer a stream of Electronic Defence within this degree structure.
2. Research Master's Degree with Coursework (MSc (Eng) Electrical Engineering Specializing in Radar):
   This master's degree consists of 3 x 20 credit courses and a 120-credit dissertation. The core course is Introduction to Radar, plus two more specialized radar courses.
3. Research Master's Degree by Dissertation (MSc (Eng) Electrical Engineering Specializing in Radar):
   This master's degree requires a 180-credit research dissertation. This degree is intended for students with radar experience who would not benefit from the coursework, or students who wish to tackle a large research project.

Continuation or Upgrade to PhD

Students who complete and pass any of the three master's degrees can continue to study for a PhD. Alternatively, students who are registered for either of the MSc (Eng) Research master's degrees and who are progressing well with their studies, can upgrade to a PhD without completing the master's degree.

Occasional Postgraduate Registration

We offer the option of registering as an occasional postgraduate student for individual courses for nondegree purposes. For busy people who work in industry, but who would like to register for a master's degree, the option exists to pass some or all 6 courses over 2 or 3 years, whilst continuing to work in industry, and to complete the remaining courses and the minor dissertation in less than 1-year full time. The credits passed as an occasional student can be transferred into the degree.

Entry Requirements for a Radar Master's Degree

1. A 4-year Engineering Degree or Science Honours degree with at least 2 years of Mathematics.
2. A BTech Degree from a South African University of Technology with at least 5 years of experience in Radar or another relevant field.
3. A 3-year Bachelor of Science degree with at least 2 years of Mathematics and 5 years of experience in Radar or another relevant field.
4. A level of competence that has been attained in any other manner, which, in the opinion of Senate and on the recommendation of the faculty, is adequate for the purpose of admission as a candidate for the degree.

Please refer to the website www.radarmasters.uct.co.za/ for further information or contact the programme convenor at stephen.paine@uct.ac.za for additional information.

Continuing Professional Development

Modules of this master's programme are offered to Continuing Professional Development delegates. Six individual block release modules are offered in 2025. Continuing Professional Development students may take each module as a separate certificate course. CPD students are required to attend the lectures but are not required to submit assignments or write the exam.

Who Should Attend

Attendees are responsible for ensuring they have the necessary experience and educational background to derive full benefit from the course

Format

Each module is structured in the following way: a week of intensive contact time, comprising formal lectures, class assignments and seminars/tutorials.

Please note: these courses are currently planned to be presented face-to-face over 5 days but may be attended online for those who cannot attend in person.

Course Content

This course aims to develop an understanding of the operation and design of microwave components used in radar and telecommunication systems including transmission lines; microstrip, coaxial and waveguide circuits. Power sources/oscillators, amplifiers, noise in receivers and mixers, PIN diode switches and limiters. Along with microwave components, this course also covers antenna fundamentals, dipole and monopole antennas, microstrip and patch antennas, yagi-antennas, dish antennas as well as phased arrays.

Course Presenters

Prof Marco Martorella is a distinguished academic specializing in Radar Remote Sensing at the University of Cape Town. With a comprehensive educational background in engineering, including a BSc, MSc, and PhD, Dr. Paine has established a robust research profile centred on advanced radar technologies and their applications. His research interests span across Synthetic Aperture Radar (SAR) processing techniques, radar-based detection systems, and environmental monitoring.

Dr Francois Schonken is a researcher and academic with a BEng, MSc (Eng), and PhD from Stellenbosch University. His primary research interest lies in Passive Radar, with a focus on advancing technologies related to radar systems that do not rely on traditional active emissions. Dr Francois also actively contributes to the academic community through teaching, both at the undergraduate and postgraduate levels, in fields related to radar technology and signal processing.

Overview

Course Dates	4 – 8 August 2025
Venue	Seminar Room 6.08, 6th floor Menzies Building, University of Cape Town.
CPD	5 CPD points, ECSA registration number: *UCTREDMCA25*
Fees	Standard fee: R17 300 UCT student fee: R8 650
Radar and Electronic Defence CPD courses 2025	Introduction to Radar Systems (EEE5119Z): 24 – 28 February 2025 Advanced Mathematics (EEE5108Z): 07 – 11 April 2025 Radar Signal Processing (EEE5105Z): 30 June – 4 July 2025 Introduction to Electronic Defence (EEE5120Z): 14 – 18 July 2025 Microwave Components & Antennas (EEE5121Z): 4 – 8 August 2025 Advanced Technology and Algorithms (EEE5132Z): 8 – 12 September 2025

Registration

Registration and Cancellation

- Register for this course
- Registration covers attendance of all sessions of the course and course material.
- Registrations close one week before the start of the course. Confirmation of registration will be sent on receipt of a registration form.
- Cancellations must be received one week before the start of a course, or the full course fee will be charged.
- For more information on application and registration procedures, please visit our website: www.cpd.uct.ac.za

Certificates and CPD Points

A **digital certificate** of attendance will be awarded to CPD participants for each course. Participants need to attend 80% of the lectures to qualify for an attendance certificate. For further information on digital certificates please visit Digital Certificates at UCT.

According to guidelines set out by the Engineering Council of South Africa, attendance of this course will earn participants 5 points towards Category 1 (Developmental Activities). The ECSA validation number for this course is: *UCTREDMCA25.*

Please note: If you are interested in attending this course for credit purposes, you will need to register for the Master's Programme or as an occasional student. If you attend the course as a CPD participant, credit cannot be claimed in retrospect.

Contact details

For more information or details on CPD courses, visit our website or contact us.

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