
DEPARTMENT OF OCEANOGRAPHY

The Department is housed on the lower ground level in the RW James Building, Residence Road
 Telephone (021) 650-3277 Fax (021) 650-3979
 The Departmental abbreviation for Oceanography is SEA.

Professor and Head of Department:

I J Ansonge, BSc *Plymouth* MSc PhD *Cape Town*

South African Research Chair in Modelling of the Coupled Ocean-Land-Atmosphere Phenomena Related to Climate:

M Rouault, MSc PhD *Aix-Marseille*

Professor and UCT Fellow:

C J C Reason, BSc Hons *Cape Town* MPhil *City* MSc PhD *British Columbia*

Emeritus Professors:

G B Brundrit, BSc Hons PhD *Manchester*

F A Shillington, BSc Hons *Witwatersrand* MSc PhD *Cape Town*

Associate Professors:

J Hermes, BSc *Bangor* PhD *Cape Town* (SAEON)

M Vichi, MSc *Bologna* PhD *Oldenburg*

Senior Lecturers:

K E Altieri, MA *Princeton* PhD *Rutgers*

S Fawcett, BA Hons *Harvard* MA PhD *Princeton*

Lecturer:

Honorary Research Associates:

B Backeberg, PhD *Cape Town*

S Bernard, BSc *Soton* PhD *Cape Town* (CSIR)

N Burls, MSc PhD *Cape Town*

J Deshayes, PhD *Paris*

S Herbette, PhD *Uni de Bretagne Occidentale*

W Joubert, PhD *Cape Town*

M Krug, MSc PhD *Cape Town*

T Lamont, PhD *Cape Town*

S Pous, PhD *Uni de Bretagne Occidentale*

P Penven, PhD *Uni de Bretagne Occidentale*

C Rautenbach, PhD *TUC Norway*

S Swart, PhD *Cape Town*

Honorary Research Associates: MA-RE

P M S Monteiro, MSc PhD *Cape Town* (CSIR)

S Thomalla, PhD *Cape Town*

Departmental Librarian:

N Jabaar, Nat.Dipl Cost Accounting *CPUT*

Principal Technical Officer:

P Truter, BSc *Stell*

Chief Scientific Officer:

R Roman, MSc PhD *Cape Town*

Administrative Officer:

C Karriem, Dipl Office Administration *Rosebank College*

NANSEN-TUTU CENTRE FOR MARINE ENVIRONMENTAL RESEARCH:

I J Ansonge, BSc *Plymouth* MSc PhD *Cape Town*

B Backeberg, BSc Hons PhD *Cape Town*

M Rouault, MSc PhD *Aix-Marseille*

MARINE RESEARCH INSTITUTE (MA-RE)

The Department of Oceanography is affiliated with the Marine Research Institute. For more information refer to the “Inter-Faculty Units” section, further on in this handbook.

RESEARCH IN OCEANOGRAPHY AND ATMOSPHERIC SCIENCE

Oceanography: Ocean and atmospheric modelling, coastal oceanography, air-sea interaction, shelf dynamics, marine climatology, climate change and variability, marine and coastal meteorology, extreme events, regional oceanography, marine and atmospheric biogeochemistry, palaeo-oceanography (Professors I J Anson, C J C Reason and M Rouault, Associate Professors M Vichi and J Hermes, Lecturers Drs S E Fawcett and K Altieri).

Undergraduate Courses**Second-Year Courses****SEA2004F PRINCIPLES OF OCEANOGRAPHY**

24 NQF credits at HEQSF level 6

Convener: Dr K Altieri

Course entry requirements: BIO1004F/S or GEO1009F, CEM1000W.

Course outline:

An introduction to the principles of oceanography, including an introduction to physical, biological and chemical oceanography, marine geology, and the ocean atmosphere system. The course comprises multiple modules, which cover the above topics. Oceanographic instrumentation and methods of data analysis will be covered in the tutorials and practicals.

Lecture times: Monday - Friday, 4th period

DP requirements: Attendance at practicals and a class mark of at least 40%.

Assessment: Practical and tests count 50%; one 3-hour examination written in June counts 50%. A subminimum of 40% in the examination is required.

SEA2005S MARINE SYSTEMS

24 NQF credits at HEQSF level 6

Convener: Dr S E Fawcett

Course entry requirements: BIO1004F/S or GEO1009F, CEM1000W, SEA2004F

Course outline:

Building on the Principles of Oceanography, this more advanced course will cover the main ocean and atmosphere systems. This includes an introduction to Earth system dynamics and the study of interactions between physical processes and major biogeochemical cycles. The physical forcing and ecosystem responses will be quantitatively illustrated for upwelling systems, oligotrophic systems, coastal systems around South Africa, and the Southern Ocean. Emphasis will be on treating the systems in an integrative manner. The course comprises six 2-week modules, which cover the above topics. Methods of data sampling and analysis will be covered in the tutorials and practicals.

Lecture times: Monday - Friday, 4th period

DP requirements: Attendance at practicals, and a class mark of at least 40%.

Assessment: Practical and tests count 50%; one 3-hour examination written in October counts 50%. A subminimum of 40% in the examination is required.

Third-Year Courses

SEA3004F OCEAN & ATMOSPHERE DYNAMICS

36 NQF credits at HEQSF level 7

Convener: Associate Professor M Vichi

Course entry requirements: PHY1031F or equivalent, BIO1004S or GEO1009F, CEM1000W, SEA2004F, SEA2005S.

Course outline:

The Ocean & Atmosphere dynamics course will begin to specialise in advanced material related to physical oceanography, atmospheric science and climate. These topics will include a quantitative approach to ocean/atmosphere dynamics, theories of circulation and the development of ocean and atmospheric weather systems, coupled ocean/atmosphere processes, interactions and feedbacks with the carbon cycle in the earth system and climate change. Methods of analysis of both observations and model data will be covered in the tutorials and practicals.

Lecture times: Monday - Friday, 4th period

DP requirements: Attendance at tutorials and practicals, and a class mark of at least 40%.

Assessment: Tutorials/practicals and tests count 40%; one 3-hour examination written in October counts 60%. A subminimum of 40% in the examination is required.

Postgraduate Courses

SEA4001W OCEAN & ATMOSPHERE SCIENCE HONOURS

Since the code SEA4001W will not carry a NQF credit value, students will be concurrently registered for SEA4003W (coursework component of 112 NQF credits) and SEA4004W (research project of 48 NQF credits).

160 NQF credits at HEQSF level 8

Convener: Professor I J Ansorge

Course entry requirements: A BSc degree with a major/specialisation in Ocean & Atmosphere Science or in a related discipline. CEM1000W or equivalent is a prerequisite. Acceptance will be at the discretion of the Head of Department who will consider quality of final year results, material covered in the undergraduate curriculum, and possibly referee reports. Preference may be given to UCT graduates who meet the course entry requirements.

Course outline:

Honours students intending careers in ocean and atmosphere science will complete a full set of modules and a research project. Honours students from Environmental & Geographical Science, Applied Mathematics, and other physical science and engineering departments, are encouraged to attend selected modules. The curriculum includes lecture-tutorials, seminars and practical work in advanced oceanography, meteorology and climate, an introduction to modelling and data analysis. Practical work includes fieldwork at sea and may include dive training (class 4 diving qualification, at the students own cost if they choose to do the dive course). Student performance in each module may be assessed by project work, seminar presentations, written assignments and examinations, together making up 65% of the final mark. In the second half of the year the research project will take priority. Students will be expected to present a seminar on their projects at the year's end.

Assessment: Module assessment by submission of a research portfolio, which includes fieldtrip reports, skills examination and formal test results. A weighted average of the continuous assessment of reports and tests counts 65% of the final mark; the research project counts 35% of the final mark. The research project must be passed at 50%. These component parts of the course will be combined in a final overall mark which will be reflected against the course code SEA4001W, with PA (pass) entered against the coursework and project codes; each of these components must be passed separately for the award of the degree.

SEA5000W OCEAN & ATMOSPHERE SCIENCE DISSERTATION

180 NQF credits at HEQSF level 9

Course outline:

This course consists of an investigation of an approved topic chosen for intensive study by the candidate (student), culminating in the submission of a dissertation. The dissertation shall demonstrate the successful completion of a programme of training in research methods, a thorough understanding of the scientific principles underlying the research and an appropriate acquaintance with the relevant literature. It must be clearly presented and conform to the standards of the department and faculty. The dissertation will usually consist of a report detailing the conduct, and analysis of the results of, research performed under the close guidance of a suitably qualified supervisor/s. The dissertation should be well-conceived and acknowledge earlier research in the field. It should demonstrate the ability to undertake a substantial and informed piece of research, and to collect, organise and analyse material. General rules for this degree may be found in the front of the handbook.

SEA5001W PHYSICAL OCEANOGRAPHY DISSERTATION

180 NQF credits at HEQSF level 9

Course outline:

This course consists of an investigation of an approved topic chosen for intensive study by the candidate (student), culminating in the submission of a dissertation. The dissertation shall demonstrate the successful completion of a programme of training in research methods, a thorough understanding of the scientific principles underlying the research and an appropriate acquaintance with the relevant literature. It must be clearly presented and conform to the standards of the department and faculty. The dissertation will usually consist of a report detailing the conduct, and analysis of the results of, research performed under the close guidance of a suitably qualified supervisor/s. The dissertation should be well-conceived and acknowledge earlier research in the field. It should demonstrate the ability to undertake a substantial and informed piece of research, and to collect, organise and analyse material. General rules for this degree may be found in the front of the handbook.

SEA5011F OPERATIONAL OCEANOGRAPHY COURSEWORK

50 NQF credits at HEQSF level 9

Convener: Associate Professor M Vichi**Course entry requirements:** A relevant Honours degree (or equivalent). Students with backgrounds in scientific and engineering disciplines are encouraged to apply.**Co-requisites:** This course is a component of the Applied Ocean Sciences Master's coursework (refer to BIO5012W). Co-requisites are BIO5013F and minor dissertation code chosen from the ones listed in the BIO5012W handbook. Changes in the dissertation code are allowed according to the student background and prior to consultation with the course conveners.**Course outline:**

This course is comprised of 4 modules focusing on the usage and provision of marine services that describe the ocean physical and biogeochemical state through observational and modeling components. The course cover the global ocean and coastal observing systems, the usage of ocean diagnostics and climate indicators as well as an introduction to the major monitoring techniques for physical and biogeochemical oceanography. Qualified students will have the possibility of participating to an open ocean research cruise in July. In addition, students will choose at least two elective courses, chosen from a range of modules offered in both disciplinary streams. They provide the student the opportunity to explore new areas, or look at more specific disciplinary backgrounds in the vast subject of ocean sciences. The list and details of these courses will be made available at the opening of each registration period in the BIO5012W handbook on the Marine Research Institute website.

Assessment: Every module is assessed independently either with a class test or individual project assignments. The syllabus and the relative weight for each module are described in a handbook that will be made available on the BIO5012W website (hosted by the Marine Research Institute).

SEA5012W APPLIED OCEAN SCIENCES MINOR DISSERTATION

90 NQF credits at HEQSF level 9

Convener: Associate Professor M Vichi and Dr C Reed

Course entry requirements: A relevant Honours degree (or equivalent). Students with backgrounds in scientific and engineering disciplines are encouraged to apply.

Co-requisites: BIO5012W, BIO5013F, BIO5014F/SEA5011F

Course outline:

The minor dissertation, which forms 50% of the overall degree, is based on a six-month supervised research project. The choice of project will be determined by the student's prior qualification and in agreement with the course conveners and supervisors. The dissertation should be submitted at the end of January, with the possibility of extension to June of the next year.

Assessment: The minor dissertation must be presented for formal examination. The coursework and minor dissertation each count 50% towards the degree; each must be passed separately for the award of the degree.

SEA6000W OCEAN & ATMOSPHERE SCIENCE THESIS

360 NQF credits at HEQSF level 10

Course outline:

The PhD is a research degree on an advanced topic under supervision, which can be taken in any of the departments in the Faculty. Examination is by thesis alone. A candidate shall undertake doctoral research and advanced study under the guidance of a supervisor/s appointed by Senate. The thesis must constitute a substantial contribution to knowledge in the chosen subject, must show evidence of original investigation and give a full statement of the literature on the subject. The PhD degree demands that the candidate is able to conduct independent research on his/her own initiative. Through the thesis the candidate must be able to demonstrate that he/she is at the academic forefront in the topic selected, that the work is original and that it advances our knowledge in the relevant field. Candidates are referred to the rules for this degree as set out in Book 3, General Rules and Policies.