BScHons in Physics

Programme Code

12998 – 797 (128)

Specific Admission Requirements

- A BSc degree with Physics as major with an average final mark of at least 60% in Physics 3.
- Applications which deviate from the abovementioned requirement, for example if a BSc degree was obtained elsewhere, will only be considered on recommendation of the Department and approval by the Faculty Committee.
- The Department may require supplementary work, depending on your background.

Closing Date for Applications

Apply online at **http://www0.sun.ac.za/pgstudies/** by 31 October of the previous year and submit all supporting documents where applicable. Late applications can be submitted until 30 November. In exceptional cases, if there are any places available, applications will be considered until the beginning of the academic year.

If you are not an SU student, please note that your application may take longer to process due to the verification of qualifications. Therefore, apply early.

Promotion Rules

- To obtain this degree you must pass with an average of at least 50% and achieve a subminimum of 45% in all modules.
- If you achieved at least 40% in a module or modules of 16 credits or less, the Department will allow a second assessment opportunity in the modules concerned.
- If you are taking the Radiation and Health Physics stream you should note that a final mark of 50% in Physics 718, 750, 751, 752 and 753 is required to be admitted to an internship as a medical physicist.

Programme Structure

The following streams are offered:

- BScHons in Physics (Laser Physics stream);
- BScHons in Physics (Nuclear Physics stream);
- BScHons in Physics (Radiation and Health Physics stream); and
- BScHons in Physics (Theoretical Physics stream).

Duration of Programme

The normal duration of the programme is one year, but under exceptional circumstances and at the discretion of the department, it is possible to repeat a module. The programme begins a week before the general start of classes.

Programme Content

The curricula of the respective streams are set out below.

Stream Laser Physics (128 credits)

Compulsory Modules

(credits = 104)

Compulsory modules can only be replaced by alternative modules in consultation with the coordinator of the Laser Physics Honours programme, and with approval of the departmental programme committee.

Subject Number	Module Code	Credits	Module Name	Semester
10445	711	8	Electromagnetism	1
10590	712	8	Lagrange and Hamilton Mechanics	1
10586	714	16	Quantum Mechanics B (Advanced Formalism and Applications)	1
10390	716	8	Atomic Physics	1
10702	721	16	Statistical Physics B (Introduction to Interacting and Non-equilibrium Systems)	2
63274	741	32	Physics Project	2
13934	745	8	Laser Technology	2
17221	772	8	Optics	1

plus

Elective Modules

(credits = 24)

Please note: The elective modules available in any particular year will vary depending on availability of lecturing staff or visiting lecturers. The programme offering for a given academic year will be finalized and approved by the departmental programme committee before the start of the academic year and communicated to potential students.

Choose three of the following modules to the value of 24 credits.

Subject Number	Module Code	Credits	Module Name	Semester
10752	713	8	Solid State Physics	1
13940	742	8	Special Topics in Applied Photonics	Both
13939	743	8	Special Topics in Biophotonics	Both
12546	744	8	Laser Spectroscopy	2
13936	746	8	Quantum Optics	2
10610	747	8	Molecular Physics	2
13937	773	8	Nonlinear Optics	2
13938	774	8	Special Topics in Optics	Both

Stream Nuclear Physics (128 credits)

Compulsory Modules

(credits = 112)

Subject Number	Module Code	Credits	Module Name	Semester
10445	711	8	Electromagnetism	1
10590	712	8	Lagrange and Hamilton Mechanics	1
10752	713	8	Solid State Physics	1
10586	714	16	Quantum Mechanics B (Advanced Formalism and Applications)	1
10708	718	8	Radiation Interaction	2
10702	721	16	Statistical Physics B (Introduction to Interacting and Non-equilibrium Systems)	2
63274	741	32	Physics Project	2
10563	748	8	Nuclear Reactions and Nuclear Structure	2
10706	753	8	Radiation Protection	2

plus

Elective Modules

(credits = 16)

Choose two of the following modules.

Please note: All of these modules will not necessarily be presented each year

Subject Number	Module Code	Credits	Module Name	Semester
10587	719	8	Quantum Mechanics C (Functional Integral Formulation)	1
13941	749	8	Selected Topics in Nuclear Physics	2
10753	754	8	Many-body Theory	2
10674	755	8	Relativistic Quantum Field Theory	2

Stream Radiation and Health Physics (128 credits)

Compulsory Modules

Compulsory modules can only be replaced by alternative Physics modules in consultation with the coordinator of the Radiation and Health Physics Honours programme, and with approval of the departmental programme committee.

Subject Number	Module Code	Credits	Module Name	Semester
10445	711	8	Electromagnetism	1
10590	712	8	Lagrange and Hamilton Mechanics	1
10752	713	8	Solid State Physics	1
10586	714	16	Quantum Mechanics B (Advanced Formalism and Applications)	1
10390	716	8	Atomic Physics	1
10708	718	8	Radiation Interaction	2
63274	741	32	Physics Project	2

10563	748	8	Nuclear Reactions and Nuclear Structure	2
10467	750	8	Physics of Radiation Dosimetry/Radiology	2
10465	751	8	Physics of Nuclear Medicine	2
10466	752	8	Physics of Radiotherapy	2
10706	753	8	Radiation Protection	2

Stream Theoretical Physics (128 credits)

Compulsory Modules

(credits = 96)

Subject Number	Module Code	Credits	Module Name	Semester
10445	711	8	Electromagnetism	1
10590	712	8	Lagrange and Hamilton Mechanics	1
10752	713	8	Solid State Physics	1
10586	714	16	Quantum Mechanics B (Advanced Formalism and Applications)	1
13948	719	8	Relativistic Quantum Mechanics	1
10702	721	16	Statistical Physics B (Introduction to Interacting and Non-equilibrium Systems)	2
63274	741	32	Physics Project	2

plus

Elective Modules

(credits = 32)

Please note: The elective modules available in any particular year will vary depending on availability of lecturing staff or visiting lecturers. The programme offering for a given academic year will be finalized and approved by the departmental programme committee before the start of the year and communicated to potential students.

Choose modules from the following list to the value of 16 credits.

Subject Number	Module Code	Credits	Module Name	Semester
13985	757	8	Bayesian Physics	2
10424	758	8	Dynamic Systems and Complexity	1
10753	754	8	Many-body Theory	2
10674	755	16	Relativistic Quantum Field Theory	2
13942	756	8	Selected Topics in Theoretical Physics	2

plus

Choose modules to the value of 16 credits from honours modules in Physics, Mathematics or Applied Mathematics in consultation with the Department of Physics.