

# Honours programmes in Physics — 2014

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# 1 Term schedule (2014)

## 1.1 Overview — 1st Semester 2014

Week	No.	Devoted to	Important dates
27.01–31.01	M.1(See 2.1)	Honours welcoming, Mathematical methods lectures	<ul style="list-style-type: none"> <li>•Welcoming 09:00 on 27.01,</li> <li>•General introduction to Dept. Library 14:00 on 27.01,</li> <li>•Library information session (JSG) 14:00-15:30 on 31.01</li> </ul>
03.02–07.02	M.2	Mathematical methods lectures, Faculty Post-graduate workshop, Dept Information Session	<ul style="list-style-type: none"> <li>•Faculty of Science Post-graduate workshop (Sec. 9) on 04.02,</li> <li>•Phys. Dept. information session for graduate students at 13:00 on 05.02,</li> </ul>
10.02–14.02	L1.1 (See 2.2)	Normal lectures Term 1 start	<ul style="list-style-type: none"> <li>•Feedback discussion of coordinator with students on 27.02 (See 7)</li> <li>•For lecturers: Question papers for test week with internal moderator by 14.03</li> <li>•Public Holiday on 21.03,</li> <li>•Feedback discussion of coordinator with students on 20.03</li> </ul>
17.02–21.02	L1.2	Normal lectures	
24.02–28.02	L1.3	Normal lectures	
03.03–07.03	L1.4	Normal lectures	
10.03–14.03	L1.5	Normal lectures	
17.03–21.03	L1.6	Normal lectures	
24.03–28.03		T1.1 (See 4.1)	Test week (no lectures)
31.03–4.04	Mid-semester break		
7.04–11.04	L2.1 (See 2.3)	Normal lectures	<ul style="list-style-type: none"> <li>•For lecturers: Marks discussion on 19.04</li> <li>•Feedback discussion of coordinator with students on 17.04,</li> <li>•Friday timetable on Wednesday 16.04,</li> <li>•Public holiday on 18.04</li> <li>•Public Holiday on 21.04,</li> <li>•Monday timetable on Tuesday 22.04</li> <li>•Public holidays on 28.04 and 1.05,</li> <li>•For lecturers: Question papers for test period with internal moderators by 09.05</li> <li>•Feedback discussion of coordinator with students on 8.05</li> </ul>
14.04–18.04	L2.2	Normal lectures	
21.04–25.04	L2.3	Normal lectures	
28.04–2.05	L2.4	Normal lectures	
05.05–09.05	L2.5	Normal lectures	
12.05–16.05	L2.6	Normal lectures	
19.05–23.05	L2.7	Normal lectures	
26.05–30.05	T2.1 (See 4.2)	Test period (no lectures)	
02.06–06.06	T2.2	Test period (no lectures)	
09.06–13.06			•For lecturers: Marks finalisation, Marks discussion

## 1.2 Overview — 2nd Semester 2014 (to be finalised in May 2014)

Week	No.	Devoted to	Important dates
21.07–25.07	L3.1	Normal lectures	<ul style="list-style-type: none"> <li>•Public holiday, Saturday 09.08,</li> <li>•student feedback session 07.08 at 13:00</li>   <li>•<i>for lecturers: test to internal moderators 29.08</i></li> </ul>
28.07–01.08	L3.2	Normal lectures	
04.08–08.08	L3.3	Normal lectures	
11.08–15.08	L3.4	Normal lectures	
18.08–22.08	L3.5	Normal lectures	
25.08–29.08	L3.6	Normal lectures	
01.09–06.09	L3.7	Normal lectures	
08.09–12.09		Mid-semester break	
15.09–19.09	T3 (See 4.3)	Test week (no lectures)	
22.09–26.09	L4.1	Normal lectures	<ul style="list-style-type: none"> <li>•Public holiday, Wednesday 24.09</li>   <li>•Student feedback session 9.10 at 13:00</li> <li>•<i>for lecturers: tests to internal moderators 17.10</i></li> </ul>
29.09–03.10	L4.2	Normal lectures	
06.10–10.10	L4.3	Normal lectures	
13.10–17.10	L4.4	Normal lectures	
20.10–24.10	L4.5	Normal lectures	
27.10–31.10	L4.6	Normal lectures	
03.11–07.11	T4.1 (See 4.4)	Test period (no lectures)	
10.11–14.11	T4.2	Test period (no lectures)	

## 2 Lecturing details: 1st semester

### 2.1 Schedule: Weeks starting 27.01 and 3.02 (M)

- Weeks devoted mainly to mathematical methods courses
- Introduction of students to course
- Students are obliged to attend the Faculty of Science Post-graduate workshop on 04.02
- Important (obligatory) information session for graduate students in the Physics Department at 13:00 on 05.02
- Library introduction — Friday 31 January at 14:00 in the JS Gericke Library (Sciences Subject Librarian). Following this Mrs Colleen April will present a brief introduction to the departmental library facilities in the Merensky Building.

Time	Monday, 27.01	Tuesday, 28.01	Wednesday, 29.01	Thursday, 30.01	Friday, 31.01
08:30–10:30	<i>Start and welcome at 09:00</i>	Mathematical Methods — Extremum principles (K. K. Müller-Nedebock)	Mathematical Methods — Series expansions (K. K. Müller-Nedebock)	Mathematical Methods — Fourier analysis and delta functions (K. K. Müller-Nedebock)	Mathematical Methods — Integration in the complex plane and other techniques (K. K. Müller-Nedebock)
10:30–11:00		Tea break	Tea break	Tea break	Tea break
11:00–13:00	Library information	Math. Methods continues	Math. Methods continues	Math. Methods continues	Math. Methods continues
13:00–14:00					
14:00–16:30	Introduction: Library and Building	Math. Methods continues	Math. Methods continues	Math. Methods continues	JSG Library information session

Time	Monday, 3.02	Tuesday, 4.02	Wednesday, 5.02	Thursday, 6.02	Friday, 7.02
08:30–10:30	Mathematical Methods (W. D. Heiss)	Faculty of Science Post-graduate workshop (see separate programme)	Mathematical Methods (W. D. Heiss)	Mathematical Methods — Vector calculus (C. Rohwer)	Mathematical Methods — Tools from complex analysis (H. Weigel)
10:30–11:00	Tea break	Tea break	Tea break	Tea break	Tea break
11:00–13:00	Math. Methods continues	PG Workshop (see sep. prog.)	Math. Methods continues	Math. Methods continues	Math. Methods continues
13:00–14:00			Dept. Info.		
14:00–16:30	Math. Methods continues	PG Workshop (see sep. prog.)	Math. Methods continues	Math. Methods continues <b>and at 16:00 Inst. Th. Phys. Group meeting</b> (obligatory for hon. in theor. phys.)	Math. Methods continues

## 2.2 Schedule: Weeks starting on 10.02–24.03 (L1)

- Public holidays: 21.03 (Friday)
- Dates for lecturers: 14.03 tests to internal moderators
- Dates for students: Feedback sessions on 27.02 and 21.03
- Data on modules: (6 weeks, usually with 2 two-hour session per week, exceptions for public holidays, of course)
  - P741 Honours Project — experimental physics programmes — E. G. Rohwer
  - P711 Electromagnetism — C. M. Rohwer
  - P712 Lagrangian and Hamiltonian Dynamics — B. I. S. van der Ventel
  - P714 Quantum Mechanics B — W. D. Heiss (with C. M. Rohwer)
  - P721 Statistical Physics B — K. K. Müller-Nedebock
  - P772 Optics — Part 1 Nonlinear Optics (13 lecturing sessions, 6 tutorials) — C. M. Steenkamp

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P772 Optics	P714 Quantum Mech. B	P721 Stat. Phys. B / P772 Optics	P721 Stat. Phys. B	P711 Electrom.
10:30–11:00	Tea break	Tea break	Tea break	Tea break	Tea break
11:00–13:00	P711 Electrom.	Laser Group meeting; Departmental Colloquium at 12:00	P714 Quantum Mech. B	P712 Lagr. & Ham. Dyn.	P712 Lagr. & Ham. Dyn.
13:00–14:00				Feedback with coordinator (only certain dates, see Sec. 7)	
14:00–16:30	P714 Quantum Mech. B Tut.	P712 Lagr. & Ham. Dyn. Tut.	P721 Stat. Phys. B Tut. / P772 Optics Tut.	Honours Project in Physics (Laboratory slot for students following <i>experimental</i> options in Lasers & Nucl. Phys.) <b>and</b> Theoretical Physics Group Meeting at 16:00	P711 Electrom. Tut.

### 2.3 Schedule: Weeks starting on 7.04–19.05 (L2)

- Public holiday: 18.04, 21.04, 28.04, 1.05 (Wednesday)
- On Wednesday 16.04 SU has a **Friday timetable**
- On Tuesday 22.04 SU has a **Monday timetable**
- Dates for lecturers: 2nd term tests with internal moderators on 09.05
- Dates for students: Feedback sessions on 17.04 and 08.05
- Data on modules (seven weeks in total but with numerous public holidays):
  - P741 Honours Project — experimental physics streams — E. G. Rohwer
  - P713 Solid State Physics — K. K. Müller-Nedebock
  - P714 Quantum Mechanics B — W. D. Heiss (with C. Rohwer)
  - P716 Atomic Physics — H. von Bergmann
  - P719 Quantum Mechanics C — H. C. Eggers
  - P721 Statistical Physics B — K. K. Müller-Nedebock

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P713 Solid State Phys.	P721 Stat. Phys. B / P716 Atomic Phys.		P719 Quantum Mech. C	P714 Quantum Mech. B
10:30–11:00	Tea break	Tea break	Tea break	Tea break	Tea break
11:00–13:00	P719 Quantum Mech. C	Laser Group meeting; Departmental Colloquium at 12:00	P713 Solid State Phys.	P714 Quantum Mech. B	P721 Stat. Phys. B / P716 Atomic Physics
13:00–14:00				Feedback with coordinator (only certain dates, see Sec. 7)	
14:00–16:30	P719 Quantum Mech. C Tut.	P713 Solid State Physics Tut.	P714 Quantum Mech. B Tut.	Lab. slot for Honours Project (for <i>experimental</i> options in Lasers & Nucl. Phys.) <b>and</b> Theoretical Physics Group Meeting at 16:00	P721 Stat. Phys. B / P716 Atomic Phys. Tut.

### 3 Lecturing details: 2nd semester (Tentative: schedule will be finalised May 2014)

#### 3.1 Module information

- P741 Physics Honours Project (32 credits, all semester) — see programme representatives
- P744 Spectrophysics (4th term, Laser Physics Programme) — H. P. H. Schwoerer
- P745 Quantum Optics and Laser Techniques (3rd and 4th terms, Laser Physics Programme) — E. G. Rohwer and G. W. Bosman
- P747 Molecular Physics (4th term, Laser Physics Programme) — H. P. H. Schwoerer
- P772 Modern Optics Part 2 (3rd term, Laser Physics Programme) — G. W. Bosman
- P748 Nuclear Reactions and Structure (3rd term, Nuclear Physics, Health and Radiation Physics Programmes) — S. M. Wyngaardt
- P718 Nuclear Interaction with Matter (3rd term, Health and Radiation Physics Programme) — J. A. Stander
- P750, 751, 752, 753 (Health and Radiation Physics) — presented at iThemba LABS and Tygerberg Campus
- P754 Quantum Many-Body Theory (4th term, Nuclear Physics and Theoretical Physics Programmes) — M. Kastner
- P755 Relativistic Quantum Mechanics and Field Theory (3rd and 4th terms, Nuclear Physics and Theoretical Physics Programmes) — H. Weigel
- **Not offered during 2014:** P757 Entropy and Information (3rd term, Theoretical Physics Programme) — *Theoretical physics students should please consult with the honours course coordinator as regards alternatives*

#### 3.2 Laser Physics Programme

##### 3.2.1 Laser Physics: 3rd Term (L3)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P745 Quantum Optics & Laser Techn.	P772 Mod. Optics	P745 Quantum Optics & Laser Techn.	P741 Project all day	P747 Mol. Phys.
10:30–11:00					
11:00–13:00	P745 Tut.		P772 Mod. Optics		
14:00–16:30	P747 Mol. Phys. Tut.		P772 Tut.		

##### 3.2.2 Laser Physics: 4th Term (L4)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P745 Quantum Optics & Laser Techn.		P745 Quantum Optics & Laser Techn.	P741 Project all day	P741 Project all day
11:00–13:00	P744 Spectrophysics		P744 Spectrophysics		
14:00–16:45	P744 Tut.		P745 Tut.		

### 3.3 Radiation and Health Physics Programme

- Students should please get the appropriate schedule of modules 750, 751, 752, 753 at Tygerberg Hospital and iThemba LABS from Miss Christine Ruperti. To our knowledge these will take place on Wednesdays and Thursdays. Details must be confirmed via Miss Ruperti.

#### 3.3.1 Radiation and Health Physics: 3rd Term (L3)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P748 Nucl. Phys.		Tyg. modules all day	Tyg. modules all day	P748 Nucl. Phys.
11:30–13:00	P718 Nucl. Int.				P718 Nucl. Int.
14:00–16:30	P718 Tut.	P748 Tut.			

#### 3.3.2 Radiation and Health Physics: 4th Term (L4)

Only Tygerberg-based module options (Wednesdays and Thursdays) and project work.

### 3.4 Nuclear Physics Programme

#### 3.4.1 Nuclear Physics: 3rd Term (L3)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30		P755 Rel. QM & Field Th.	P741 Project all day	P755 Rel. QM & Field Th.	P748 Nucl. Phys.
11:00–13:00	P748 Nucl. Phys.				
14:00–16:30	P755 Tut.			P748 Tut.	

#### 3.4.2 Nuclear Physics: 4th Term (L4)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P754 Many-body Th.	P755 Rel. QM & Field Th.	P741 Project all day	P755 Rel. QM & Field Th.	P741 Project all day
11:00–13:00				P754 Many-body Th.	
14:00–16:30	P755 Tut.	P754 Tut.			

### 3.5 Theoretical Physics Programme

#### 3.5.1 Theoretical Physics: 3rd Term (L3)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30		P755 Rel. QM & Field Th.	P741 Project all day	P755 Rel. QM & Field Th.	P741 Project all day
11:00–13:00					
14:00–16:30	P755 Tut.	P757 Tut.			

#### 3.5.2 Theoretical Physics: 4th Term (L4)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–10:30	P754 Many-body Th.	P755 Rel. QM & Field Th.	P741 Project all day	P755 Rel. QM & Field Th.	P741 Project all day
11:00–13:00				P754 Many-body Th.	
14:00–16:30	P755 Tut.	P754 Tut.			



## 4 Test schedules

### 4.1 Test week: starting on Monday 24.03 (T1)

- Dates for lecturers: tests to internal moderators on 22.03

Date and day	Time	Evaluation
24.03, Monday	10:00	Quantum Mechanics B (714) Test
25.03, Tuesday	10:00	Langrangian and Hamiltonian Dynamics (712) Test
26.03, Wednesday	10:00	Optics (772) Test
27.03, Thursday	10:00	Statistical Physics B (721) Oral examinations
28.03, Friday	10:00	Electromagnetism (711) Test

### 4.2 Test period: 26.05–6.06 (T2)

- Dates for lecturers: tests to internal moderators on 09.05

Date and day	Time	Evaluation
27.05, Tuesday	10:00	Quantum Mechanics B (714) Test
30.05, Friday	10:00	Statistical Physics B (721) Oral Examinations
30.05, Friday	10:00	Atomic Physics (716) Test
3.06, Tuesday	10:00	Quantum Mechanics C (712) Test
6.06, Friday	10:00	Solid State Physics (713) Oral Examinations

### 4.3 Test week: starting on Monday 15.09 (T3) (Tentative: finalisation May 2013)

- **Radiation and Health Physics Exams must please be agreed with the relevant lecturers at iThemba LABS and Tygerberg!**
- Dates for lecturers: tests to internal moderators on 29.08, marks discussion 27.09

Date and day	Time	Evaluation
15.09, Monday	10:00	P745 and P718
16.09, Tuesday	10:00	P755
17.09, Wednesday	10:00	P747
18.09, Thursday	10:00	P748
19.09, Friday	10:00	P772

### 4.4 Test period: starting on Monday 03.11 (T4)

- **Radiation and Health Physics Exams must please be agreed with the relevant lecturers at iThemba LABS and Tygerberg!**
- Dates for lecturers: tests to internal moderators on 17.10, marks discussion 15.11

Date and day	Time	Evaluation
03.11, Monday	10:00	P745
04.11, Tuesday	10:00	P755
06.11, Thursday	10:00	P744
07.11, Friday	10:00	P754
12.11, Wednesday	10:00	<b>Deadline: Projects</b>
12.11, Wednesday	10:00	P741 Project presentations

## 5 The reason for the mathematical methods section

Being well-versed in certain types of calculations is essential for every honours student, whether a theorist or experimentalist. The first common part of the honours course is a module on mathematical methods in which you will get to practise these fundamentally important skills and revise important concepts. In order for us to achieve the correct level at which to teach we shall be assessing your level of skill. Your answers will be anonymous!

## 6 Test periods

End-of-term tests are lecture free.

## 7 Student–coordinator feedback sessions

More-or-less monthly sessions with the honours course coordinator are scheduled as follows:

Date, time, venue
27.02, 13:00, tea room
20.03, 13:00, tea room
24.04, 13:00, tea room
08.05, 13:00, tea room
07.08, 13:00, tea room
09.10, 13:00, tea room

## 8 Departmental colloquia and group meetings

The participation in academic and research seminars and colloquia is fundamental to successful scientific research. We require that all honours students attend Departmental Colloquia (generally scheduled on Tuesdays at 12:00), as well as seminars in their respective specialist groups. Please consult with the group to be added to their mailing list and for more information on the scheduling of these events. Students' attendance of colloquia and group seminars will be considered should we need to decide on borderline cases between pass/fail or distinction/no distinction.

## 9 Faculty of Science postgraduate student orientation

The Faculty will be presenting a Post Graduate Research Orientation Workshop on Tuesday 4 February in the Con de Villiers Hall (A201), J.C. Smuts Building. Attendance of the workshop is compulsory for Honours students.