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This handbook applies to all Junior and Senior Freshman students taking the Pharmacy (Integrated) programme taught by the School of Pharmacy & Pharmaceutical Sciences. It provides a guide to what is expected of you on this programme, and the academic and personal support available to you. The information provided in this handbook is accurate at the time of preparation. Any necessary revisions will be notified to students via email. Please note that, in the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in course handbooks, the provisions of the General Regulations will prevail.

1 INTRODUCTION

1.1 SCHOOL VISION AND MISSION

Our vision is to provide an environment where excellence in teaching and research is valued and encouraged. Our mission is to deliver continuous learning in the science and practice of pharmacy, supported by innovative teaching and a culture which is aligned with best practice. We strive to ensure that our staff and students contribute to society as world class professionals and leaders.

1.2 TRADITION

Brief history
The School of Pharmacy and Pharmaceutical Sciences at Trinity College Dublin has been offering a pharmacy degree since 1977.

The School has world class research and teaching facilities on the main College campus, in the Panoz Institute. These include purpose built teaching spaces such as the Boots Unit – comprising a technology enhanced learning space for clinical skills and patient care, a practice area designed to facilitate the development of communication skills, and adaptable small group teaching rooms. The School has further facilities in the collaborative research space provided by the Trinity Biomedical Sciences Institute (TBSI), through which Trinity’s leadership position in immunology, bioengineering and cancer is maintained. These facilities drive a step-change in the level and impact of research in these fields.

The main academic focus of the School of Pharmacy and Pharmaceutical Sciences at the undergraduate level is the five-year Pharmacy (Integrated) programme. Structured professional placements are a key element of the new programme and occur throughout the five years. The teaching on this programme includes lectures, problem-based learning, small group teaching, laboratory and dispensing practicals, clinical and patient care activities to encourage the understanding of aspects of healthcare, drug sources, medicines preparation, analysis, quality control, chemistry, metabolism, safety, efficacy, regulation, etc. Our programme includes an individual research project, which gives students an opportunity to develop focused research with one-to-one supervision. There is the opportunity to undertake this research project abroad at international partner universities.

The School offers dynamic and successful postgraduate taught programmes in Pharmaceutical Manufacturing Technology, in Pharmaceutical Sciences, Community Pharmacy and in Hospital Pharmacy. The School is active in CPD (Continuing Professional Development) and was the first School in TCD to offer modular postgraduate delivery with the Cardiology in Clinical Pharmacy module, which has attracted postgraduate students from across Hospital and Community Pharmacy Practice.

The School of Pharmacy and Pharmaceutical Sciences is at the forefront of international pharmacy research. Our research activities are broadly described as consisting of five main research areas: 1) Drug Development; 2) Disease, Drug Mechanisms and Safety; 3) Cancer Research; 4) Pharmaceutics & and Pharmaceutical Technology; 5) Clinical Pharmacy and Pharmacy Practice.

The Pharmacy undergraduate syllabus leading to a B.Sc. (Pharm.) degree is taught over 4 years and satisfies the accreditation requirements of the Pharmaceutical Society of Ireland, i.e., the statutory registration body. It also complies with the training standards defined in three pharmaceutically relevant EU Directives: 2005/36/EC as
amended, 2001/82/EC as amended and 2001/83/EC as amended. Directive 2005/36/EC specifies the educational requirements necessary for the mutual recognition of registered pharmacists within the European Economic Area (EEA) member states. Directives 2001/82/EC and 2001/83/EC specify the educational requirements necessary to perform the functions in the pharmaceutical industry of the ‘Qualified Person’, i.e., one who is responsible for the supervision and control of the manufacture of pharmaceutical products for human and veterinary use.

2 STRUCTURES, MANAGEMENT AND SYSTEMS IN PLACE

2.1 COLLEGE
For details see: http://www.tcd.ie/vpcao/academic-governance/

2.2 SCHOOL GOVERNANCE
The School of Pharmacy & Pharmaceutical Sciences is one of the four Schools which make up the Faculty of Health Sciences. The other three are the School of Dental Science, the School of Medicine and the School of Nursing and Midwifery.

HEAD OF SCHOOL
Heads of School are appointed by, and are formally accountable to, the Board.
The Head of School is a member of the College Head of Schools Committee.
http://www.tcd.ie/teaching-learning/academic-governance/head-of-school.php

DIRECTOR OF TEACHING AND LEARNING (UNDERGRADUATE)
Assoc. Professor John J. Walsh, B.A., Ph.D.
The Director of Teaching and Learning (Undergraduate) has delegated responsibility for the undergraduate affairs of the School and plays a central strategic role with regard to both existing and new teaching programmes. The Director of UGTL is a member of the College Undergraduate Studies Committee.

DIRECTOR OF TEACHING AND LEARNING (POSTGRADUATE)
Assoc. Professor John Gilmer, B.A., Ph.D.
The Director of Teaching and Learning (Postgraduate) has delegated responsibility for the postgraduate affairs of the School and plays a central strategic role with regard to both existing and new research programmes. The Director of PGTL is a member of the College Postgraduate Teaching & Learning Committee.

DIRECTOR OF RESEARCH
The Director of Research has delegated responsibility for the development of research and innovation in the School. The Director plays a strategic role in promoting and enabling research in the School, working closely with the Head of School.
http://www.tcd.ie/teaching-learning/academic-governance/dir-of-research.php
2.3 SCHOOL COMMITTEES AND STUDENT SUPPORT STRUCTURES

School Committee
https://www.tcd.ie/Secretary/academic-governance/school-committee.php
This Committee currently includes one undergraduate and one postgraduate representative.

School Executive Committee
https://www.tcd.ie/Secretary/academic-governance/school-executive.php
This Committee currently includes one undergraduate and one postgraduate representative.

Programme Management Committee (PMC)
This is a sub-committee of the School Executive and responsible for monitoring, reviewing and making recommendations on the development of the pharmacy degree course.
This Committee currently includes at least one representative from Freshman Pharmacy, at least one representative from Sophister Pharmacy and one representative for the 5th year.

Student Representation
Undergraduate students in each of the four years of the course select a representative to relay the ideas and concerns of their year and to report to their year on developments within the School.

Student Forum
This is a student-led forum which, together with tutor representatives, discusses issues of student importance. It currently comprises the four student representatives - one from each year of the B.Sc. (Pharm.) programme.

College Tutors
The Tutorial Service is unique, confidential and available to all undergraduate students offering student support in all aspects of College life. You can find your tutor’s name and contact number by logging in to https://my.tcd.ie

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<tr>
<th>Role</th>
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<tr>
<td>Asst. Prof. John Quigley</td>
<td><a href="mailto:quigley@tcd.ie">quigley@tcd.ie</a></td>
<td></td>
</tr>
<tr>
<td>Assoc. Prof. John Walsh</td>
<td><a href="mailto:jjwalsh@tcd.ie">jjwalsh@tcd.ie</a></td>
<td></td>
</tr>
<tr>
<td>Assoc. Prof. Andrew Harkin</td>
<td><a href="mailto:aharkin@tcd.ie">aharkin@tcd.ie</a></td>
<td></td>
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<tr>
<td>Assoc. Prof. Lorraine O’Driscoll</td>
<td><a href="mailto:lodrisc@tcd.ie">lodrisc@tcd.ie</a></td>
<td></td>
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<tr>
<td>Asst. Prof. Fabio Boylan</td>
<td><a href="mailto:fabio.boylan@tcd.ie">fabio.boylan@tcd.ie</a></td>
<td></td>
</tr>
<tr>
<td>Asst. Prof. Astrid Sasse</td>
<td><a href="mailto:sassea@tcd.ie">sassea@tcd.ie</a></td>
<td></td>
</tr>
<tr>
<td>Asst. Prof. Sheila Ryder</td>
<td><a href="mailto:sryder@tcd.ie">sryder@tcd.ie</a></td>
<td></td>
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<tr>
<td>Asst. Prof. Sinead Smith</td>
<td><a href="mailto:smithsi@tcd.ie">smithsi@tcd.ie</a></td>
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<tr>
<td>Academic Liaison Officer</td>
<td><a href="mailto:jjwalsh@tcd.ie">jjwalsh@tcd.ie</a></td>
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<tr>
<td>Disability Liaison Officer</td>
<td><a href="mailto:hsheridn@tcd.ie">hsheridn@tcd.ie</a></td>
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<td>Undergraduate - Year Coordinators</td>
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<tr>
<td>Junior Freshman year:</td>
<td>Asst. Prof. John Quigley</td>
<td><a href="mailto:jquigley@tcd.ie">jquigley@tcd.ie</a></td>
</tr>
<tr>
<td>Senior Freshman year:</td>
<td>Asst. Prof. Astrid Sasse</td>
<td><a href="mailto:sassea@tcd.ie">sassea@tcd.ie</a></td>
</tr>
<tr>
<td>Junior Sophister year:</td>
<td>Asst. Prof. Fabio Boylan</td>
<td><a href="mailto:fabio.boylan@tcd.ie">fabio.boylan@tcd.ie</a></td>
</tr>
<tr>
<td>Senior Sophister year:</td>
<td>Assoc. Prof. Andrew Harkin</td>
<td><a href="mailto:aharkin@tcd.ie">aharkin@tcd.ie</a></td>
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<tr>
<td>Erasmus/International Contact &amp; Undergraduate Research Liaison Officer</td>
<td><a href="mailto:carlos.medina@tcd.ie">carlos.medina@tcd.ie</a></td>
<td></td>
</tr>
<tr>
<td>Transition year coordinator / Science without Borders contact</td>
<td><a href="mailto:fabio.boylan@tcd.ie">fabio.boylan@tcd.ie</a></td>
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<tr>
<td>Trinity Access Programmes (TAP) contact</td>
<td><a href="mailto:jjwalsh@tcd.ie">jjwalsh@tcd.ie</a></td>
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Student 2 Student (S2S)
From the moment you arrive in College right the way through to your end of year exams Student 2 Student (S2S) is here to make sure your first year is fun, engaging and a great foundation for the rest of your time in Trinity. You will meet your two S2S mentors in Freshers’ Week and they’ll make sure you know other people in your course before your classes even start. They’ll keep in regular touch with you throughout your first year and invite you to events on and off campus. They will also give you useful information about your course and what to look out for. Mentors are students who have been through first year and know exactly what it feels like, so you never have to worry about asking them a question or talking to them about anything that’s worrying you.

S2S also offers trained Peer Supporters if you want to talk confidentially to another student or just to meet a friendly face for coffee and a chat.

S2S is supported by the Senior Tutor’s Office and the Student Counselling Service.

http://student2student.tcd.ie, E-mail: student2student@tcd.ie, Phone: 01 896 2438

SCHOOL NOTICE BOARDS
Notice boards for undergraduates are located in the School lobby and also at the entrance to the laboratories.

2.4 COLLEGE SUPPORT SERVICES

Student Counselling Service
Confidential, free to students, emergency appointments, online counselling, one to one counselling
Groups, Workshops, Podcasts
3rd Floor, 7-9 South Leinster Street
Tel: 896 1407
student-counselling@tcd.ie
http://www.tcd.ie/Student_Counselling/

Student Learning Development
Study Skills, Exams, Presenting, Self Management, Writing
Drop-In Service, Workshops, 1:1 Appointments
3rd Floor, 7-9 South Leinster Street
Tel: 896 1407
student.learning@tcd.ie
http://www.tcd.ie/Student_Counselling/student-learning/

Chaplains
The Chaplains run a Bereavement Support Group for those who have experienced loss (please contact the Chaplains). The Chaplains will also help you make contact with other religious communities in Dublin. Free simple lunch on Tuesdays during term time between 12.30 and 14.00 h.
House 27 (Senior Tutor’s House)
Tel: Alan O’Sullivan / Peter Sexton: 896 1260, Bernie Daly: 896 1402 ; Julian Hamilton : 896 1901
chaplaincy@tcd.ie
http://www.tcd.ie/Chaplaincy/

College Health Service
Appointments may be made in person or by telephone.
This service is free to most students
House 47 (beside the rugby pitch)
Tel: 896 1556
http://www.tcd.ie/collegehealth/
Disability Service
Room 2054, beside the Lecky Library, in the Arts Building
Tel: 896 3111
disab@tcd.ie
http://www.tcd.ie/disability/

Niteline
A confidential help-line for students run by students is available during term-time, by freephone between 9 pm and 2.30 am 7 nights a week at 1800 793 793.

Academic Skills for Successful Learning
Is an online resource offering e-learning modules in Blackboard Learn on:
Writing skills; referencing and understanding plagiarism; reading and notemaking and critical thinking skills. It comprises a wide variety of interactive activities which you complete before taking a module assessment to see how much you learned.
Available 24 hours a day, 7 days a week. Log in via http://mymodule.tcd.ie/
2.5 THE SCHOOL OF PHARMACY & PHARMACEUTICAL SCIENCES ACADEMIC STAFF

**Head of School**
*Professor in Pharmacetics and Pharmaceutical Technology*

**Chair/Professor of Pharmacology**
[vacant]

**Assoc. Professor in Pharmacology**
Neil Frankish, B.SC. (C.N.A.A.), M.A., PH.D. (STRATH.)

**Asst. Professor in Pharmacology**
Carlos Medina, M.B. (LA LAGUNA), PH.D. (A.U. BARCELONA)

**Adj. Professor in Pharmaceutical Chemistry**

**Assoc. Professor in Pharmaceutical Chemistry**
John Gilmer, B.A., PH.D.

**Asst. Professors in Pharmaceutical Chemistry**
Astrid Sasse, STAATSEXAMEN PHARMAZIE (BERLIN), DR. RER. NAT. (BERLIN), M.A.

**Assoc. Professor in Pharmaceutics and Pharmaceutical Technology**
Carsten Ehrhardt, STAATSEXAMEN PHARMAZIE (HAMBURG), DR. RER. NAT. (SAAARRÜCKEN), F.T.C.D. (2013)
Lidia Tajber, B.S.M.A.R. (MEDICAL UNIVERSITY OF SILESIA), M.A., PH.D., P.G.DIP. G.I

**Asst. Professors in Pharmaceutics and Pharmaceutical Technology**

**Assoc. Professors in Practice of Pharmacy**
Martin Henman, B.P.HARM. (BRAD.), M.A., PH.D. (BRAD.), M.R.P.HARM.S., M.P.S.I.
Cicely Roche, B.SC. (PHARM.), M.SC. (HEALTHCARE ETHICS & LAW), M.SC. (COMM PHARM), M.P.S.I. (PART-TIME)
Tamasine Grimes, B.SC. (PHARM.), M.SC (HOSP.PHARM.), P.G. DIP (HEALTH SERVICES MANAGEMENT), PH.D. (R.C.S.I.), M.P.S.I. (PART-TIME)

**Asst. Professor in Practice of Pharmacy**
Sheila Ryder, B.SC. (PHARM.), M.SC. (BELFAST), M.P.S.I.
Máire O’Dwyer, B.Sc. (PHARM), P.G. Dip. (STAT), Ph.D., MPSI.

**Asst. Professor in Practice of Pharmacy (PART-TIME, Practice Educator)**

**Teacher Practitioner (PART-TIME) Boots the Chemists**
Karen Rossi, B.SC. (PHARM.), M.SC. (COMM. PHARM.), M.P.S.I.
Claire O’Neill, B.SC. (PHARM.), M.P.S.I.

**Assoc. Professors in Pharmacognosy**
John J. Walsh, B.A., PH.D.

**Asst. Professor in Pharmacognosy**
Fabio Boylan, B.SC. (PHARM.) (UNIVERSITY OF RIO), PH.D. (UNIVERSITY OF RIO), M.A.

**Adj. Assoc. Professor**
Tim Delaney, B.SC. (PHARM), M.SC. (IMI)

**Adj. Asst. Professors**
Ingrid Hook, B.SC. (PHARM) (MANC), M.A., M.SC. (N.U.I.), M.R.P.HARM.S.
Catriona Bradley, B.SC. (PHARM.), PH.D., M.P.S.I.
Evelyn Deasy, B.SC. (PHARM.), M.SC., M.P.S.I.
Ronan MacLoughlin, B.SC. (N.U.I.), PH.D. (N.U.I.)
Conor McCrystal, B.SC. (PHARM.), PH.D. (BELFAST), M.R.P.HARM.S., M.P.S.I.
2.6 ADMINISTRATIVE STAFF, EXECUTIVE OFFICERS AND TECHNICAL STAFF IN THE SCHOOL OF PHARMACY & PHARMACEUTICAL SCIENCES

SCHOOL ADMINISTRATIVE MANAGER
Mr. Dimitrios Paraskevas  paraskd@tcd.ie  Ext. 2938

SCHOOL OFFICE
Ms. Valerie Shanley  shanleyv@tcd.ie  Ext. 2809

UNDERGRADUATE STUDENT ADMINISTRATION
Freshman Years (JF & SF)
Ms. Helen Byrne Jacob  hjacob@tcd.ie  Ext. 2803

Sophister Years (JS & SS)
Ms. Louise Griffin  griffilo@tcd.ie  Ext. 2350

TECHNICAL STAFF
Mr. Ray Keaveny  Chief Technical Officer  rkeaveny@tcd.ie  Ext. 2814
Ms. Therese Moloney  Senior Technical Officer  tmalony@tcd.ie  Ext. 2824/2859
Ms. Rhona Prendergast  Senior Technical Officer  rprndgdst@tcd.ie  Ext. 2831/2855
Mr. Brian Talbot  Senior Technical Officer  talbotb@tcd.ie  Ext. 2859/2862
Mr. Joseph Reilly  Senior Technical Officer  jreilly@tcd.ie  Ext. 2854/2856
Mr. Trevor Woods  Technical Officer  woodst@tcd.ie  Ext. 2833
Ms. Maureen Brunt  Senior Lab Attendant  bruntm@tcd.ie  Ext. 2854/2856
Ms. Pauline McGlue  Senior Lab Attendant  mcgluep@tcd.ie  Ext. 2833
Mr. Conan Murphy  Senior Lab Attendant  murphyc5@tcd.ie  Ext. 2833
Ms. Irene Pelow  Senior Lab Attendant  pelowi@tcd.ie  Ext. 2931
3 SAFETY WITHIN THE SCHOOL

3.1 General Information:

(i) Students are encouraged to bring any concerns regarding safety to the attention of both the School (see Safety Officers below) and the College Safety Officer, Mr. Tom Merriman, ext. 1914 (email: tom.merriman@tcd.ie).

(ii) All undergraduate students presenting in each years’ practical classes are advised by the Staff Supervisor about general safety issues such as fire hazards, smoking, eating, protective clothing, etc. and first aid facilities.

Health and Safety Manual: It is the obligation of every student to familiarise him/herself with the content of the safety manual. The Health and Safety Manual was handed out to every student at the Orientation Day and is also available on the School’s website:

SCHOOL SAFETY OFFICERS

Asst. Prof. M. Santos   Biological Safety Officer   santosmm@tcd.ie

Mr. R. Keaveny          Chemical Safety Officer    rkeaveny@tcd.ie

Assoc. Prof. A. Harkin  Radiation Safety Officer  aharkin@tcd.ie

The B.Sc. (Pharm.) course consists of lectures, laboratory classes, seminars, study visits, tutorials and some work experience. Laboratories by their nature require those working in them to be highly aware of the safety implications of that particular working environment.

The School wishes to establish and maintain a working environment in which the physical and mental well-being of staff and students is maintained at the highest levels practicable, and to provide a basis whereby problems of safety that arise in the working environment are solved in co-operation with staff and students and their representative organisations.

3.2 Staff and students are obliged to operate the ‘neighbour principle’.

This involves:

(i) Taking reasonable care for their own safety and health and that of others who may be affected by their acts or omissions while at work;

(ii) Co-operating with the College to such an extent as will enable the College to comply with the provisions of legislation and to meet its general duties on safety, welfare and health;

(iii) Not intentionally interfering with or misusing any means, appliance, equipment or other aid provided for securing the health, safety or welfare of the College community;

(iv) The use of any clothing, equipment or appliance required for the purpose of securing his/her health, safety and welfare at work;

(v) Reporting to the College management any defects in plant, equipment or procedures which are a danger to safety, health or welfare.

N.B. In the interests of safety, any student who fails to obey regulations or instructions from academic or technical staff, including demonstrators, may be excluded from the laboratory.
3.3 Important Safety Precautions - PLEASE READ CAREFULLY

(i) Smoking in College buildings is not allowed.
(ii) Hallways and passageways must be kept clear.
(iii) The location of fire exits should always be noted.
(iv) The location of fire extinguishers and their mode of use should be noted.
(v) The location of the first aid cabinet in each laboratory should be noted.
(vi) Dress code when working in the laboratories:
   - White lab coats must always be worn and closed
   - Safety spectacles must be worn when appropriate
   - Appropriate masks may need to be worn when working with certain types of equipment and/or chemicals
   - No open-toed shoes or sandals may be worn while in the laboratory.
   - Long hair must be tied back and kept from covering the face.
(vii) Use of mobile/camera phones, iPods, radios and all other electronic equipment unrelated to practical work is prohibited while working in laboratories.
(viii) In the event of an accident taking place in the laboratory involving injury, no matter how trivial it may seem, the proper procedure is to:
   - Call the ‘First-Aider’ associated with the laboratory to give first-aid if appropriate.
   - Phone the College Health Service (Ext. 1556) for advice and refer for medical evaluation if he/she is ambulatory and not in distress or otherwise seriously injured.
   - If the victim is known to be or likely to be seriously injured always call the College emergency number (1999) for help.
   - Never transport the victim to hospital in a private car or taxi.
   - Report all accidents to a School of Pharmacy & Pharmaceutical Sciences Safety Officer.
(ix) Laboratory work must be performed where at all possible only during normal working hours. No laboratory work of any kind should be undertaken after hours unless at least two persons are present.
(x) Eating and drinking in the laboratories is strictly forbidden, this includes chewing gum.
(xi) Any suspicious persons / packages / floods etc. must be immediately reported to the College Emergency Number (1999) at Front Gate.

4 UNIVERSITY STUDY

The B.Sc. (Pharm.) course is accredited by the Pharmaceutical Society of Ireland and is also recognised for “free movement” purposes under the various European Union Directives on Pharmacy which lay down the subjects to be studied. The minimum number of study hours for a Pharmacy course form part of national and European accreditation criteria. There are two types of study hours set out in this booklet.

1. Supervised study which consists of the lecture and laboratory practical courses, tutorials, workshops, seminars, study visits and specified work experience. It can also include laboratory report preparation. School regulations require you to attend all scheduled classes and you may be refused permission to take your written examinations if your attendance is deemed non-satisfactory. (See University Calendar; Part 2, General regulations and information, Non-satisfactory attendance and course work, §25, http://www.tcd.ie/calendar)

2. Guided study comprises directed but unsupervised study you must do outside the formal course. It can consist of suggested reading of textbook references, published articles in scientific and medical journals, use of electronic data bases (e.g., Micromedex Healthcare Series), exercises in problem solving, reading and extension of your lecture notes, revision for term tests and annual examinations. The amount of guided study on average involves 2-3 hours per lecture and 1 hour for each hour of practical work. The hours specified are very much minimum hours of guided study expected of you over the four years of the course.

Independent study, note-taking at lectures and the writing of laboratory reports etc., are an important way of developing your learning abilities and capacity for study. For pharmacists in particular, the ability to learn continuously is absolutely essential because of the necessity for continuing professional development as a practising pharmacist. If you are concerned about study technique at University level you should discuss this with your tutor and avail of the courses made available each year in College. It is vital that you learn how to use the
library efficiently, particularly the electronic databases of relevance to Pharmacy and the Pharmaceutical Sciences.

Continuous assessment marks will be allocated based on attendance at practicals, performance and practical write-ups. Laboratory notebooks/manuals/reports must be presented for assessment by the date specified in the manual or by College staff.

IMPORTANT
Late submissions will not be assessed unless a valid reason is provided, and students will be deemed not to have satisfied the School’s examination requirements.

Academic Integrity and Plagiarism
There is a well-established academic convention that work performed and published by other people is acknowledged fully if it is being used in any written work submitted for assessment. This convention applies to all academic work (theses, research papers, text books etc.) but in your case it applies to all material used in assessments, lab books and written examinations. College takes breaches of its regulations on plagiarism very seriously and you must read the next section very carefully.

In order to support students in understanding what plagiarism is and how they can avoid it, an online central repository to consolidate all information and resources on plagiarism was created. The central repository is being hosted by the Library and is located at http://tcd-ie.libguides.com/plagiarism.

It includes the following:
(i) The 2015-16 Calendar entry on plagiarism for undergraduate and postgraduate students;
(ii) The matrix explaining the different levels of plagiarism outlined in the Calendar entry and the sanctions applied;
(iii) Information on what plagiarism is and how to avoid it;
(iv) ‘Ready, Steady, Write’, an online tutorial on plagiarism which must be completed by all students;
(v) The text of a declaration which must be inserted into all cover sheets accompanying all assessed course work;
(vi) Details of software packages that can detect plagiarism, e.g. Turnitin.

When submitting assessed work, cover sheets containing the following declaration must be completed and handed in together with the assignment:

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at: http://www.tcd.ie/calendar

I have also completed the Online Tutorial on avoiding plagiarism ‘Ready, Steady, Write’, located at http://tcd-ie.libguides.com/plagiarism/ready-steady-write


5 PHARMACY (INTEGRATED) PROGRAMME
The four year B.Sc. (Pharm.) degree forms part of a new integrated 5-year programme of studies, which is commencing in Trinity in September 2015. The new five-year integrated pharmacy programme provides practical learning in work place settings in years two, four and five of the course.

Pharmacy is the study of all aspects of drugs, both natural and synthetic in origin, including their chemistry, their uses in medicines, and how they work within the body. Pharmacists work in a variety of settings – community pharmacies, hospitals, long-term care facilities, and within the pharmaceutical industry; to name just a few. In many respects, their role as a key healthcare professional is to help people achieve the best results from their medications.

While this degree is an essential requirement if you wish to practise as a community or hospital pharmacist, Pharmacy at Trinity opens a wide variety of professional opportunities in both industry and the healthcare sector. A strong interest in science is important to fully enjoy the course.
The curriculum consists of supportive learning content based on core scientific, healthcare and professional elements, evolving into learning of knowledge, skills, attitudes and behaviours enabling the development of the student in professionally applying scientific and healthcare knowledge and skills in any pharmacy practice setting.

The Pharmacy syllabus has been designed to provide you with an all-round education in the pharmaceutical sciences and in the practice of pharmacy. The five-year Pharmacy (Integrated) programme comprises a variety of approaches to teaching Pharmacy by friendly, dedicated, enthusiastic and approachable staff: Lectures, seminars, tutorials, workshops, small-group teaching, problem-based learning, site-visits, computer-assisted learning, web discussion boards, wikis, online group assignments, communication skills, career planning, clinical case studies, inter-professional learning, laboratory and dispensing practicals and a research project.

The development of the student as an active learner is core to the curriculum. The degree of active learning increases through years 1 to 5. From the beginning of year 1, active and reflective learning is encouraged and supported. This is primarily evident through the commencement of a reflective CPD (continued professional development) e-portfolio in year 1, along with the introduction of CCF-Live. CCF-Live continues through years 1-5 of the programme, enabling the student’s development of critical reflection skills relating to their learning needs for CCF competency demonstration. The maintenance of a reflective CPD e-portfolio is continued in all years of the Pharmacy (Integrated) programme.

Structured professional placements are a key element of the new programme and occur throughout the five years.

Modules are assessed by final examinations and continuous assessment, such as written assignments, essays, lab reports, OSCEs (objective structured clinical examinations), etc. which contribute to the overall mark in a module.
Those students who carry on to successfully complete year four of the programme will be awarded the B.Sc.(Pharm.) and may progress into a postgraduate fifth year which leads to the award of a M.Pharm. and entitlement to apply for registration as a pharmacist. Students who have been found unfit to practise may be prevented from progressing to the fifth (M.Pharm.) year of the Pharmacy (Integrated) programme. There will be a postgraduate fee associated with the fifth year of the new programme, payable by the student.

5.1 INFECTIOUS DISEASE POLICY
In the interests of reducing the risk of the transmission of infectious disease from patients to students, or student to patient, all new entrants must attend their regular medical practitioner or the College Health Service prior to registration to certify their vaccination status or immunity to tuberculosis, measles, mumps, rubella and chickenpox. In addition, new entrants must produce evidence of their hepatitis B and C status and where appropriate confirmation that they do not have active disease. Students who are hepatitis B negative but not already deemed to be immune to hepatitis B will be required to undergo a course of vaccination which is timetabled into the first year (see University Calendar http://www.tcd.ie/calendar and Academic Registry http://www.tcd.ie/study/eu/undergraduate/admission-requirements/infectious-diseases/).

5.2 GARDA VETTING
Students undertaking the Pharmacy (Integrated) programme are required to undergo vetting by the Garda Síochána or other relevant police force prior to commencing any work experience/pharmacy practice attachments. If, as a result of the outcome of these vetting procedures, a student is deemed unsuitable to attend clinical or other professional attachments/work experience, he/she may be required to withdraw from his/her programme of study. (see Academic Registry http://www.tcd.ie/study/eu/undergraduate/admission-requirements/garda-vetting/)

5.3 FITNESS TO PRACTISE AND CODE OF CONDUCT
Students undertaking the Pharmacy (Integrated) programme are expected to abide by the Code of Conduct for Pharmacy students which may be found on the School website (see https://pharmacy.tcd.ie/undergraduate/course-notices/coursenotes.php and on page 77 of this Student Handbook).

Students should also note the School’s procedures for dealing with Fitness to Practise issues (School website, see https://pharmacy.tcd.ie/undergraduate/course-notices/coursenotes.php and page 67 of this Student Handbook) and the general College Regulations on Fitness to Practise, University Calendar, Part 2, General regulations and information, §28 http://www.tcd.ie/calendar.
5.4 ERASMUS / SUMMER RESEARCH PLACEMENTS

Our summer research placement programme (coordinated by Asst. Prof. Carlos Medina), including ERASMUS, encourages pharmacy students to perform a research project over the summer at another University, as part of their undergraduate degree programme. The following universities currently participate in Erasmus exchanges: University of Montpellier, France; University of Lyon, France; University of Munich, Germany; University of Vienna, Austria; and University of Bath, UK. The School has also signed academic exchange agreements (covering the exchange of undergraduate and postgraduate students, as well as academic staff) with the School of Pharmacy at the University of Southern California (USA) and the Faculty of Pharmaceutical Sciences, University of Toyama (Japan).

5.5 LEARNING OUTCOMES FOR THE PHARMACY (INTEGRATED) PROGRAMME

The learning outcomes of the Pharmacy (Integrated) programme curriculum are identified separately at the undergraduate and postgraduate level as follows:

The aim of the undergraduate part of the Pharmacy (Integrated) programme leading to the B.Sc. (Pharm.) award is to provide students with education in the pharmaceutical sciences and the practice of pharmacy in all its forms. Specific programme outcomes are that the graduate should be able to:

1. Demonstrate professionalism and exercise duty of care to the patient and the competence to make decisions in the best interests of the patient and society;
2. Demonstrate a commitment to life-long learning, in particular an awareness of the need for continuing education and professional development in the chosen field of pharmacy practice;
3. Adapt to developments in pharmacy and medicine;
4. Utilise the theory, concepts and methods pertaining to pharmacy and pharmaceutical sciences, including the biological, physical, quantitative and social sciences;
5. Explain how medicines are developed, formulated, manufactured, tested and brought to the market place;
6. Exercise appropriate judgement in a number of complex planning, design, technical, organisational and/or management functions related to pharmacy and pharmaceutical sciences;
7. Use advanced skills to conduct research and/or professional activity related to the practice of pharmacy, accepting accountability for all related decision making;
8. Manage learning tasks independently, professionally and ethically in a wide range of learning contexts;
9. Demonstrate provision of simulated pharmacy services in accordance with pharmaceutical knowledge, evidence, legislation and codes of professional conduct and practice;
10. Integrate pharmacological, pharmaceutical and clinical knowledge to interpret and evaluate medicines usage safely and effectively in evidence-based practice;
11. Apply the principles underpinning quality, safety and efficacy in all aspects of pharmaceutical, scientific and professional activities.

On successful completion of the Masters part of the Pharmacy (Integrated) programme leading to the M.Pharm award, the graduate should have satisfied the statutory educational requirements for registration as a pharmacist. Specific programme outcomes are that on successful completion of the course the graduate should be able to:

1. Utilise appropriate knowledge, skills, attitudes and behaviours to meet the Core Competency Framework for Pharmacists and to provide pharmacist-delivered patient care as a member of a multidisciplinary healthcare team, underpinned by appropriate and sufficient understanding of the principles and techniques of the pharmaceutical, biomedical and social sciences and pharmacy practice;
2. Promote and contribute to the optimal, rational, safe and effective use of medicines taking account of wider determinants of health, evaluate health outcomes, and advance the practice of pharmacy and its contribution to society, including the pursuit of research and other scholarly activities;
3. Engage in patient-centered pharmacy practice in a range of patient-facing and non-patient-facing pharmacy settings;
4. Practise with professional and personal integrity and discipline of mind, together with an understanding of and commitment to the ethos of professionalism, in particular a commitment to the concepts of patient centered care and duty of care;
5. Demonstrate a commitment to continuing his/her professional development as a self-directed lifelong learner, with an awareness of the need to maintain appropriate experience in the practice of pharmacy and to keep abreast of scientific and professional developments.

5.4 ATTENDANCE AND COURSE WORK
Students must attend for appropriate academic instruction in each term of each academic year and must satisfy the Head of the School as to their academic progress in each term in order to proceed with their year. The School may, from time to time, draw up regulations determining the required attendance of students at the various forms of instruction.

To rise with their class students must (a) attend satisfactorily the lectures, seminars, tutorials etc. given in the modules of their course each term as required by the University Council and the School of Pharmacy and Pharmaceutical Sciences regulations, (b) perform and complete all laboratory work to the satisfaction of the Head of the School, (c) attend and complete to a satisfactory standard all visits and teaching exercises at Practice sites and the prescribed periods of work experience and (d) pass the prescribed examinations (including practical tests and continuous assessment components).

Please also see ‘Examination and Progression Regulations of the School of Pharmacy and Pharmaceutical Sciences’, page 83.

Non-satisfactory attendance and course work
At the end of the teaching term, students who have not satisfied the School requirements with regard to attendance may be returned to the Senior Lecturer as non-satisfactory for that term. In accordance with the regulations laid down by the University Council, non-satisfactory students may be refused permission to take their annual examinations and may be required by the Senior Lecturer to repeat their year.

5.5 EXEMPTIONS – MATURE, GRADUATE AND TRANSFER STUDENTS
Mature, graduate or transfer students may apply for exemptions from coursework and lectures. They do so by applying to the appropriate module coordinator, either directly or through their College Tutor. The module coordinator will make a recommendation to the Director of Teaching & Learning (Undergraduate). All applications for exemption must be made within four calendar weeks of the start of Michaelmas Teaching Term and must be approved by the Director of Teaching & Learning (Undergraduate). All students must present for written examinations in all modules. In the case of those who have been granted an exemption from practicals, their theory mark is returned.

N.B. PLEASE NOTE EXAMINATION REGULATIONS AND DETAILS ON COURSE MODULES MAY BE SUBJECT TO AMENDMENT.
### 5.6 MODULE CODES AND TITLES OF THE PHARMACY (INTEGRATED) PROGRAMME

#### JUNIOR FRESHMAN (Year 1)

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG1101</td>
<td>Physiology</td>
<td>5</td>
</tr>
<tr>
<td>BY1P02</td>
<td>Cell and Molecular Biology</td>
<td>5</td>
</tr>
<tr>
<td>BIPH01</td>
<td>Biochemistry</td>
<td>5</td>
</tr>
<tr>
<td>PH1101</td>
<td>Organic and Inorganic Chemistry for Pharmacy</td>
<td>10</td>
</tr>
<tr>
<td>PH1102</td>
<td>Physical Pharmacy I</td>
<td>5</td>
</tr>
<tr>
<td>PH1103</td>
<td>Pharmaceutical Analysis I</td>
<td>5</td>
</tr>
<tr>
<td>PH1104</td>
<td>Introduction to Pharmaceutics and Formulation</td>
<td>5</td>
</tr>
<tr>
<td>PH1105</td>
<td>Mathematical Methods and Pharmaceutical Calculations</td>
<td>5</td>
</tr>
<tr>
<td>PH11P6</td>
<td>Practice of Pharmacy I</td>
<td>10</td>
</tr>
<tr>
<td>PH1109</td>
<td>General Principles of Pharmacology</td>
<td>5</td>
</tr>
</tbody>
</table>

#### SENIOR FRESHMAN (Year 2)

<table>
<thead>
<tr>
<th>Module code</th>
<th>Module Title</th>
<th>ECTS</th>
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</thead>
<tbody>
<tr>
<td>PH2101</td>
<td>Properties &amp; Analysis of Materials used in Medicines</td>
<td>10</td>
</tr>
<tr>
<td>PH2104</td>
<td>Physical Pharmacy, Formulation and Pharmaceutical Technology</td>
<td>15</td>
</tr>
<tr>
<td>PH2106</td>
<td>Practice of Pharmacy II</td>
<td>10</td>
</tr>
<tr>
<td>PH2108</td>
<td>Pharmaceutical Biochemistry and Biotechnology</td>
<td>10</td>
</tr>
<tr>
<td>PH2110</td>
<td>Molecular &amp; Chemotherapeutic Pharmacology and Clinical Therapeutics</td>
<td>10</td>
</tr>
<tr>
<td>PH2111</td>
<td>Blood, Cardiovascular &amp; Renal Pharmacology and Clinical Therapeutics</td>
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</tr>
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#### JUNIOR SOPHISTER (Year 3)

<table>
<thead>
<tr>
<th>Module code</th>
<th>Module Title</th>
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<tbody>
<tr>
<td>PH3102</td>
<td>Medicinal and Pharmaceutical Chemistry III</td>
<td>10</td>
</tr>
<tr>
<td>PH3103</td>
<td>Natural Sources of Drugs and Substances used in Medicines</td>
<td>10</td>
</tr>
<tr>
<td>PH3104</td>
<td>Sterile Products and Advanced Pharmaceutical Biotechnology</td>
<td>10</td>
</tr>
<tr>
<td>PH3106</td>
<td>Practice of Pharmacy III</td>
<td>10</td>
</tr>
<tr>
<td>PH3109</td>
<td>Endocrine &amp; Reproductive Pharmacology and Clinical Therapeutics</td>
<td>5</td>
</tr>
<tr>
<td>PH3110</td>
<td>Respiratory &amp; Gastrointestinal Pharmacology and Clinical Therapeutics</td>
<td>5</td>
</tr>
<tr>
<td>PH3111</td>
<td>Malignant Disease, Immunopharmacology &amp; Pharmacology of the Eye and Clinical Therapeutics</td>
<td>5</td>
</tr>
<tr>
<td>PH3112</td>
<td>Neuropharmacology and Clinical Therapeutics</td>
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#### SENIOR SOPHISTER (Year 4)

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<tr>
<th>Module code</th>
<th>Module Title</th>
<th>ECTS</th>
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<tbody>
<tr>
<td>PH4100</td>
<td>Organisation and Management Skills</td>
<td>10</td>
</tr>
<tr>
<td>PH4200</td>
<td>Professional Skills Development</td>
<td>10</td>
</tr>
<tr>
<td>PH4300</td>
<td>Professional Practice</td>
<td>10</td>
</tr>
<tr>
<td>PH4101</td>
<td>Pharmaceutical Data Analysis &amp; Bioinformatics</td>
<td>5</td>
</tr>
<tr>
<td>PH4102</td>
<td>Medicinal and Pharmaceutical Chemistry IV</td>
<td>5</td>
</tr>
<tr>
<td>PH4105</td>
<td>Pharmacokinetics, Pharmacodynamics, Biopharmaceutics &amp; Drug Metabolism</td>
<td>5</td>
</tr>
<tr>
<td>PH4107</td>
<td>Practice and Therapeutics &amp; Professionalism and Ethics</td>
<td>5</td>
</tr>
<tr>
<td>PH4112</td>
<td>Research Project</td>
<td>10</td>
</tr>
</tbody>
</table>

#### YEAR 5

<table>
<thead>
<tr>
<th>Module code</th>
<th>Module Title</th>
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</thead>
<tbody>
<tr>
<td>MPH5101</td>
<td>Industrial Pharmacy</td>
<td>5</td>
</tr>
<tr>
<td>MPH5103</td>
<td>Complementary and Alternative Medicine: Context, Legislation, Standards and Practice</td>
<td>5</td>
</tr>
<tr>
<td>MPH5104</td>
<td>Advanced Drug Delivery &amp; Molecular Pharmaceutics</td>
<td>5</td>
</tr>
<tr>
<td>MPH5106</td>
<td>Practice of Pharmacy &amp; Integrated Pharmacy Skills</td>
<td>10</td>
</tr>
<tr>
<td>MPH5108</td>
<td>Addiction Pharmacy</td>
<td>5</td>
</tr>
<tr>
<td>MPH5100</td>
<td>Supply of Medicines and Organisation and Management Skills</td>
<td>10</td>
</tr>
<tr>
<td>MPH5200</td>
<td>Leading the Safe and Rational Use of Medicines</td>
<td>10</td>
</tr>
<tr>
<td>MPH5300</td>
<td>Professional Practice and Public Health</td>
<td>10</td>
</tr>
<tr>
<td>MPH5400</td>
<td>Practice Research Project</td>
<td>10</td>
</tr>
</tbody>
</table>

**Definition of the ECTS:**

“The European Credit Transfer and Accumulation System (ECTS) is a student-centred system based on the student workload required to achieve the objectives of a programme of study.” Ref: ECTS Users’ Guide (Feb 2005) EU Commission, DG for Education and Culture”.

ECTS equivalent for each year of the course is 60 credits. [https://www.tcd.ie/teaching-learning/academic-development/ects.php](https://www.tcd.ie/teaching-learning/academic-development/ects.php)
5.7 FOUNDATION SCHOLARSHIP EXAMINATION

University Calendar, Part 2, General information and regulation, Foundation and Non-Foundation Scholarships, http://www.tcd.ie/calendar/

N.B. This examination will be held in January, before the commencement of Hilary Teaching Term. Candidates are examined in their course work up to the end of Michaelmas Term of the Senior Freshman year, together with such additional reading as may be required by the Head of the School of Pharmacy & Pharmaceutical Sciences.

The Scholarship Examination for the Pharmacy course consists of three examination papers. Papers 1 and 2 will identify students who can consistently demonstrate exceptional knowledge and understanding of key subjects of the Senior Freshmen curriculum. Paper 3 is designed for candidates to demonstrate a high level of skill in integrating knowledge across different subject areas on one common theme and to reflect and demonstrate rigorous and informed critical thought.

**Paper 1 – Pharmaceutical Sciences 1**
Topics will be drawn from the following modules: Properties & Analysis of Materials used in Medicines (PH2101) and Physical Pharmacy, Formulation and Pharmaceutical Technology (PH2104). 3 hour paper. Four questions to be answered from four.

**Paper 2 – Pharmaceutical Sciences 2**
Topics will be drawn from the following modules: Practice of Pharmacy II (PH2106), Pharmaceutical Biochemistry and Biotechnology (PH2108) and Blood, Cardiovascular & Renal Pharmacology and Clinical Therapeutics (PH2111). 3 hour paper. Four questions to be answered from six, at least one question must be attempted from each of the Modules examined therein, namely PH2106, PH2108 and PH2111.

**Paper 3 – General Paper (Alzheimer’s Disease)**
Disease management based on a scenario/case: Interdisciplinary understanding and research 3 hour paper. Candidates will be given selected scientific papers at the beginning of the Michaelmas Term. Candidates will be asked questions relating to, for example;
- the disease state and its molecular basis
- the types of treatment used at present
- the nature of the API and excipients, its presentation and the forms of delivery in use
- the provision of care for patients with the condition
- future developments in understanding of the disease, potentially new types and forms of delivery, treatment and the challenges of care.

Recommendation for Scholarship: The board of examiners will evaluate results of all papers for all candidates. In order for students to be proposed for election to scholarship, they must obtain an overall average first class result (70% or higher) in the Scholarship examinations, with a mark of at least 70% in two of the examination papers and a mark of at least 65% in the third paper.

Further information: https://www.tcd.ie/academicregistry/exams/scholarship/

Applications invited from 1st until 15th Nov 2016 (online).
Deadline for application: 5 pm, 15th November 2016.
Application link: http://www.tcd.ie/academicregistry/exams/scholarship/#Application

YouTube video on Foundation Scholars in TCD: https://www.youtube.com/watch?v=-0RweAxp6us

Scholarship Examinations: 9th - 13th January 2017
(although it may be necessary to schedule some examinations in the preceding week)

Announcement of Election to Scholarship 2017: Trinity Monday, 10th April 2017, 10 am, Front Square.


5.8 Prizes

Please also see: http://www.tcd.ie/calendar

- **Pfizer Healthcare Ltd. Junior Freshman Pharmacy Prize**: This prize is awarded for overall first place in the Junior Freshman Pharmacy Annual Examination.

- **Meagher’s Senior Freshman Pharmacy Award**: for the best overall combined mark in the Senior Freshman Annual Pharmacy Examination.

In later years of the programme further Prizes may be awarded:

- **Pfizer Healthcare Ltd Prize in Pharmacology**: To be awarded after the 3rd year; the student who attains the highest overall credit-weighted combined mark in the modules PH2110, PH2111, PH3109, PH3110, PH3111, and PH3112.

- **The Alexion Junior Sophister Pharmacy Prize**: This prize is awarded for the best combined overall mark in the Junior Sophister Annual Pharmacy Examination.

- **Sanofi Prize in Pharmacognosy**: for the highest overall mark in module PH3103 at the annual examination session.

- **Paul Higgins Memorial Prize Medal / UNIPHAR Prize in Pharmaceutical Chemistry**: To be awarded after the 4th year; the student who attains the highest overall combined mark at the annual examination session in modules PH3102 and PH4102.

- **The Alexion Senior Sophister Pharmacy Prize**: This prize is awarded to the student who obtained the highest overall mark in the B.Sc. (Pharm.) Degree at the annual examination session.

- **Gold Medal**: The Board of Trinity College may award Gold Medals to candidates who show exceptional merit at the B.Sc. (Pharm.) degree examination.

- **Johnson & Johnson Practice of Pharmacy Prize**: To be awarded after the 5th year; the student who attains the highest overall combined mark in the modules PH4107 and MPH5106.

- **LEO Pharma Prize in Pharmaceutics**: To be awarded after the 5th year; the student who attains the highest overall combined mark in the modules PH4105, MPH5101 and MPH5104.

Please note that it is not possible to predict the value of the prizes in advance as it may vary from year to year.
INTEGRATIVE TEACHING AND LEARNING IN THE PHARMACY (INTEGRATED) PROGRAMME

The Pharmacy (Integrated) programme is delivered as a series of modules over 5 years, however teaching and learning should not be perceived to be confined within each module. The qualified pharmacist practitioner will be required to draw on many different aspects of their learning when in practice, and thus the pharmacy student is encouraged to develop an integrative approach to their learning. The Pharmacy (Integrated) programme curriculum is designed to foster integrative learning.

- An integration “ladder” of 11 progressive steps has been identified for medical education [1], and each module in the Pharmacy (Integrated) programme has been assigned an integration level. Lower levels correspond to more specific discipline-based teaching, and higher levels correspond to teaching and learning which is increasingly cross-disciplinary, and relates learning content to practice experiences and settings.
- Integrative learning by the student is nurtured and facilitated through defined integrated teaching and assessment as outlined in module descriptors (supported by integrative teaching approaches), and through student reflection on guided integrative learning based on defined integration themes.

For the purpose of integrative learning and teaching in the curriculum, five themes have been defined. These five themes are directly aligned with attainment of competency according to the Pharmaceutical Society of Ireland’s (PSI) core competency framework (CCF), and are described as follows:

1. **Medicines Sourcing, Production and Use.** This theme relates to learning about all aspects of the sourcing, production and safe and effective use of medicines, facilitated by integration of foundation sciences, applied sciences and clinical topics.  
   **Aligned with CCF Domains: 3**

2. **Safe and Rational Use of Medicines.** This theme relates to all aspects of the medicines use process.  
   **Aligned with CCF Domains: 4**

3. **Pathologies, patients and populations.** This theme involves knowledge integration to improve health of patients and for maintenance and promotion of healthy communities.  
   **Aligned with CCF Domains: 5.1, 5.2 (will also facilitate domains 3 and 4).**

4. **Professionalism and communications.** This theme relates to all aspects of communications and professional, legal and ethical practice.  
   **Aligned with CCF Domains: 1.1, 1.2, 1.3, 1.4, 2.2, 2.4**

5. **Leaders and learners.** This theme relates to the development of practitioners as self-directed learners, collaboratively using and advancing knowledge at the forefront of pharmaceutical science and healthcare.  
   **Aligned with CCF Domains: 1.5, 2.1, 2.3, 5.3, 6**

Exemplary “integration schematic” diagrams have been produced to illustrate how samples of topics within each theme are covered through a range of modules throughout the 5-year programme. Each integration schematic relates to a sample topic within a theme, details how aspects of learning within a range of modules over the whole programme relate to this topic, and suggests how the learning relates to the CCF. These schematic diagrams are named based on theme number and example number. For example, the integration schematic for the first sample topic in Theme 3 is called Theme 3 Example 1. The theme (3) is “Pathologies, patients and populations” and the sample topic in the integration schematic is “inflammation”. This Theme 3 Example 1 integration schematic is provided as an illustrative example on the following page. These schematic diagrams will be made available to students when they undertake the modules which are present in each schematic.

It is emphasised that the integration schematics provided during the course are examples to guide integrative learning, to illustrate how learning can be integrated throughout the course. Provision of these sample integration schematics should assist students in relating and integrating all of their learning across modules. Furthermore, students are guided to relating their learning to the CCF through their reflective learning portfolios (introduced in PH11P6 and continuing thereafter).

- Naturally, as the student progresses through the programme, it will become apparent that there are many ways in which teaching and learning content within a module relates to other modules, within (horizontal integration) and between (vertical integration) different years of the programme.
Therefore, each module descriptor has information relating to integration under three headings:

1. The integration level of the module
2. A list of the integration schematics in which the module is present (e.g. “Theme 3, Example 1”), where applicable.
3. Other aspects which may be considered by the student for vertical and horizontal integrative learning


INTEGRATION THEME 3 SCHEMATIC EXAMPLE 1
Integration theme: Pathologies, patients and populations
CCF Domains/Competencies: 5.1, 5.2 (Also facilitates domains 3 and 4)
Topic: Inflammation

[Diagram of integration schematic example 1]
JUNIOR FRESHMAN (1\textsuperscript{st} Year)

Module details may be subject to corrections/amendments.

- \textit{It is each student’s responsibility to be aware of dates, times, locations, etc. of lectures, tutorials, seminars and practical classes.}

- \textit{Reports, continuous assessments and laboratory notebooks must be presented for assessment by the dates specified by the examiner.}

- \textit{Reports, continuous assessments and laboratory notebooks submitted after the specified dates will not be assessed unless a valid reason is given, and students will be deemed not to have satisfied the School’s examination requirements.}

\textbf{GENERAL PRE-REQUISITE:} Matriculation Requirements, and in Mathematics at Leaving Certificate an Ordinary Level grade C or Higher Level grade D or grade B at GCSE level, and in Chemistry at Leaving Certificate a Higher Level grade C as well as a Higher Level grade C in one of: Physics, Biology, Geology, Geography, Applied Mathematics and Agricultural Science.
AIMS: To provide a basic core knowledge of the normal function of the human body as a foundation for your future application of Physiology to therapeutic practice.

PRE-REQUISITES – In addition to Matriculation Requirements, students without Leaving Certificate Biology are expected to do some extra reading in areas such as cell structure and function and the basic functions of body organs. Please also refer to general pre-requisites.

LEARNING OUTCOMES: On successful completion of the module the student will be able to:
1. Recognise the structural characteristics of the basic mammalian cell types.
2. Describe the functional roles of these cell types and how they interact in the various organ systems studied during the course.
3. Explain the mechanisms by which these different organ systems are controlled in the normal human body.
4. Describe the functional interrelationships that normally exist between the organ systems during daily life.
5. Explain pathophysiological examples in some of the main organ systems
6. Recall typical normal values for those physiological variables commonly used in clinical practice.

INTEGRATION
Integration Level: 5 (Temporal Co-ordination)
Present in the following Integration Schematics: N/A

Other aspects which may be considered for integrative learning:
Horizontally within the year
BIPH01 – basic biochemical principles linking with physiology
BY1P02 – basic biological principles are built on
PH11P6 – basic understanding of physiology required and built on
PH1109 – builds basic knowledge for any module in pharmacology

Vertically across years
This module is required for a basic understanding of physiological functions and is built upon
in modules PH2108, PH2110, PH2111, PH3102, PH3109, PH3110, PH3111, PH3112, PH4102, PH4105,
MPH5104, MPH5108, MPH5200

SYLLABUS
Material will be covered on the following topics: Cells, tissues and organs, principles of cellular function, blood, homeostasis, immunity, nervous system, the eye, the ear, skeletal muscles, cardiovascular physiology, respiratory system, digestive system, liver, endocrine regulation, and urinary system.

COURSE OUTLINE

LECTURES | Lecturer
---|---
1. C&T1: Introduction. Tissue and organ composition | AK
2. C&T2: Principles of cellular function | AK
3. C&T3: Composition of the blood | AK
4. C&T4: Homeostasis, Body composition and water distribution | AK
5. C&T5: Systems of immunity and defence | AK
6. C&T6: Membrane transport & membrane potential | AK
7. N&S1: Organisation of the nervous system | ML
8. N&S2: Electrical activity in nerve pathways | ML
9. N&S3: Sensory Perception | ML
10. N&S4: The Eye | ML
11. N&S5: The Ear | ML
12. CVS1 Introduction to cardiovascular physiology | ME
13. CVS2: The heart and blood vessels | ME
14. MSC1: Skeletal muscle structure and contraction AM
15. MSC2: Mechanisms of force generation AM
16. CVS3: The cardiac cycle ME
17. MSC3: Muscle fibre types and muscle receptors AM
18. MSC4: Smooth and cardiac muscle AM
19. CVS4: Regulation of cardiac output ME
20. CVS5: Haemodynamics ME
21. CVS6: Regulation of blood pressure ME
22. RESP1: Organisation of the respiratory system ME
23. RESP2: Mechanics of breathing ME
24. RESP3: Gas exchange ME
25. RESP4: Gas transport ME
26. RESP5: Regulation of breathing ME
27. RESP6: Swallowing/larygeal function ME
28. D&M1: Organisation and motility of the digestive system ED
29. D&M2: Digestion and absorption of nutrients ED
30. D&M3: Regulation of digestive function ED
31. D&M4: Functions of the liver and gall bladder ED
32. D&M5: Regulation of metabolism ED
33. REP1: Endocrine regulation of reproduction AW
34. REP2: Menstrual cycle AW
35. REP3: Pregnancy, labour and lactation AW
36. REN1: Organisation and function of the urinary system AW
37. REN2: Regulation of body salt and water AW
38. REN3: Regulation of body pH AW

DIRECTED READING

ASSESSMENT
Pass mark = 50%

Written paper: 3 hours
Section A: 10 short answer questions 70% of marks
Section B: 45 MCQs 30% of marks

SUMMARY OF HOURS

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Practicals</th>
<th>Tutorials</th>
<th>Total contact</th>
<th>Guided study</th>
<th>TOTAL</th>
<th>ECTS</th>
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<tbody>
<tr>
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<td>77</td>
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</tbody>
</table>

Annual Examination: After marking and careful checking, examination results are scrutinised at a Departmental Examiners’ Meeting. The pass mark for JF Pharmacy is 50%.

Supplemental Examination: In most circumstances, students who fail at the final examination stage may sit a Supplemental examination in August/September. The format of the Supplemental is the same as that of the Final Examination. As for the Annual Examination, marked and checked results are scrutinised at a Departmental Examiners’ Meeting.

This module can be compensated [for compensation rules, please check the School of Pharmacy and Pharmaceutical Sciences Examination & Progression Regulations, page 83].

NB This course is taken with students from Clinical Speech & Language Studies (JF) and Radiation Therapy (SF).

More detailed information about this Module (including a detailed timetable, weekly study guides and sample exam questions) is available in the Allied Health Sciences (AHS) Physiology - Student Handbook & Study Guide 2016/2017.

Compensation
This module is compensatable.
CELL AND MOLECULAR BIOLOGY
Year 1 (Junior Freshman)  MODULE CODE: BY1P02

Staff of the Biology Teaching Centre: Assoc. Professor J. Rochford
Staff of the School of Biochemistry and Immunology: Prof. L. O’Neill
Staff of the School of Medicine: Asst. Prof. S. Doyle, Asst. Prof Fred Sheedy
Staff of the School of Genetics and Microbiology: Prof. G.J. Farrar

Coordinator: Assoc. Professor John Rochford

AIMS: To provide students with a thorough foundation in all aspects of modern molecular and cellular biology in preparation for more applied professional and clinical studies.

PRE-REQUISITES: Please see the general pre-requisites.

LEARNING OUTCOMES:
On successful completion of the module the student will be able to:
1. Describe the properties and functions of the major groups of biochemical.
2. Give an account of the origin of life, from the abiotic world to multicellular organisms, including an account of endosymbiosis.
3. Give an account of the structure and functions of the plasma membrane and the major organelles that occur in eukaryotic cells.
4. Describe the major steps involved in how a complex animal is formed.
5. Use general texts, reference books and a range of other resources to further develop knowledge of biological issues through continued independent learning,
6. Carry out a range of laboratory exercises, demonstrating the development of practical scientific skills.

INTEGRATION
Integration Level: 4 (Nesting)

SYLLABUS
Material will be covered on the following topics: Molecular and cellular basis of life; proteins; genetics; biology of microorganisms; developmental biology; techniques in molecular biology & microscopy.

COURSE OUTLINE
Lectures, practical classes and tutorials.

LECTURES

MOLECULAR AND CELLULAR BASIS OF LIFE (Prof. Luke O’Neill and Asst. Prof Fred Sheedy)
1. The chemical context of life
2. Proteins - uniquely suited to life
3. A tour of the cell / The origin and evolution of life: from molecules to cells to multicellular organism
4. The nucleus: from DNA to mRNA / mRNA to protein: The endoplasmic reticulum and Golgi apparatus
5. Energy and the cell / From photons to protons and electrons to ATP
6. Lysosomes and peroxisomes
7. How cells communicate - signal transduction

PROTEINS (Asst. Prof. Sarah Doyle)
8-9. Proteins 1 & 2
10. Proteins and Disease
11. Enzymes
12. The Cell, the cell membrane and membrane proteins

GENETICS (Prof. Jane Farrar)
13. Genetics – An Overview
14. Patterns of Inheritance
15. Cell Division – Mitosis and Meiosis
16. Linkage and Recombination
18. The Connection between Genes, Proteins and Metabolism

24
19. Mutation and its Consequences
20. Quantitative Genetics
21. Gene Cloning Technology
22. Genetic Technologies – Multiple Applications

PRACTICAL CLASSES (28 HOURS) (Assoc. Prof. John Rochford)
1. Molecular Techniques: Pipetting and spectrophotometry
2. Molecular Techniques: Purification of glutathione S - transferase by affinity chromatography
3. Molecular Techniques: Electrophoresis of proteins
4. Molecular Techniques: Assaying glutathione S - transferase
5. Microscopy 1: Use and care of microscopes and examination of simple tissues and cells
6. Microscopy 2: Some features of tissues and cells
7. Genetics: Microscopic examination of chromosomes, continuous variation and examination of pedigrees

Tutorials: A series of informal, small-group tutorials is provided by post-graduate teaching assistants to support the lecture and practical programmes, and provide the students with advice and direction in relation to continued independent learning.

DIRECTED READING:
Other sources, for further information and general background reading, as directed by lecturers.

ASSESSMENTS:
Pass mark = 50%

Written Paper: XBY11011 Essay & short-answer paper (90 minutes) Answer one essay question from 3, and five compulsory short-answer questions. 67% of total marks
Practical Test: MCQ Test (30 min). 20 questions based on practicals. Answer all questions (no negative marking). 22% of total marks
Continuous assessment of practical work during the year. 11% of total marks

SUMMARY OF HOURS

<table>
<thead>
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</table>

Compensation
This module is compensatable.
BIOCHEMISTRY
Year 1 (Junior Freshman) MODULE CODE: BIPH01

Staff of the School of Biochemistry & Immunology: Asst. Prof. K. Mok (KM), Assoc. Prof. R. Porter (RP), Asst. Prof. J. Murray (JM), Assoc. Prof. P. Voorheis (PV).

Coordinator: Asst. Prof. David Finlay (DF)

AIMS: To provide current basic biochemical concepts of cell function, and describe, by way of example, the importance of several protein and cellular functions.

PRE-REQUISITES: Please see the general pre-requisites.

LEARNING OUTCOMES: On successful completion of the module the student will be able to:
1. Describe the components of the cell
2. Detail how protein structure leads to protein function
3. Describe how cells grow and divide
4. Discuss how cells extract and transduce energy
5. Describe the basics of control of cell functions

INTEGRATION
Integration Level: 3 (Harmonisation)
Present in the following Integration Schematics: N/A

Other aspects which may be considered for integrative learning:
Horizontally within the year
PG1101 – Physiology linking to basic biochemical principles
BY1P02 – Basic biological processes linking to biochemical principles
PH1101 – Organic chemistry linking to biochemical structures of molecules
PH1109 – Builds basic knowledge for any module in pharmacology

Vertically across years
This module is required for a basic understanding of biochemical processes and is built upon in modules PH2108, PH3103

SYLLABUS
Material will be covered on the following topics: Protein structure and function, enzymology, membranes and transporters, intermediary metabolism, cell division and cell cycle, bioenergetics and bioinformatics.

COURSE OUTLINE: (Taken with JF Medicine/SF Radiation Therapy)
Lectures and a computer-aided-learning exercise.

LECTURES

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topic</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
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<tr>
<td>2-6</td>
<td>Protein structure and function</td>
<td>KM</td>
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<tr>
<td>7-10</td>
<td>Enzymology</td>
<td>JM</td>
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<tr>
<td>11-12</td>
<td>Membranes and transporters</td>
<td>RP</td>
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<tr>
<td>13-16</td>
<td>Intermediary metabolism (carbohydrates)</td>
<td>RP</td>
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<tr>
<td>17-20</td>
<td>Cell division and cell cycle</td>
<td>PV</td>
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<tr>
<td>21-22</td>
<td>Bioenergetics</td>
<td>RP</td>
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</table>

BIOINFORMATICS EXERCISE (Computer-Aided-Learning) 5 hrs - Coordinator: Dr. Glynis Robinson (GR)
ASSESSMENT

<table>
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<th>Weighting</th>
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<tbody>
<tr>
<td>Multiple choice question exam with negative marking; 2 hours, ~60 questions, all questions count toward the paper mark.</td>
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<tr>
<td>Bioinformatics exercise: continuous assessment</td>
</tr>
</tbody>
</table>

Examination date:
The 2 hour multiple choice exam will take place at the end of the 2016 Michaelmas term.

Module pass mark = 50%**. This module is compensatable.

**Failure to reach the pass mark will result in a requirement to repeat one or both of the assessments. The Supplemental MCQ examination will take place at the beginning of the 2017 Michaelmas term.

DIRECTED READING

SUMMARY OF HOURS

<table>
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Compensation
This module is compensatable.
ORGANIC AND INORGANIC CHEMISTRY FOR PHARMACY
Year 1 (Junior Freshman) MODULE CODE: PH1101

Staff of the School of Pharmacy and Pharmaceutical Sciences: Assoc. Prof. J.J. Walsh (JJW), Asst. Prof. J.M. Quigley (JMQ), Assoc. Prof. J.F. Gilmer (JG), Adj Professor M.J. Meegan (MJM), Asst. Prof. S. Ryder (SR), Asst. Prof. Máire O’Dwyer (MO’D), Asst. Prof. F. Boylan (FB), Asst. Prof. Theo Ryan (TR).

Coordinator: Asst. Prof. John Quigley

AIMS: To provide the pharmacy student with an appropriate foundation course in organic, inorganic and analytical chemistry leading to an understanding of the chemical properties of substances used in human and veterinary medicines. This material is preparatory for modules in medicinal chemistry in the Sophister years.

PRE-REQUISITES:
Please see the general pre-requisites.

LEARNING OUTCOMES: On successful completion of the module the student will be able to:
1. Describe the structure and nomenclature of simple chemical compounds of relevance in pharmacy
2. Discuss the nature of functional groups and chemical reactivity in drug molecules and explain how functional groups from organic chemistry impart properties to drug substances
3. Summarise the properties of main group elements; discuss metal co-ordination bonding and its geometries
4. Describe heavy metal toxicity and relevance in medicine
5. Describe the basic sources of drugs, the drug discovery process and how drugs are developed
6. Compile a short pharmaceutical chemistry profile of a drug molecule
7. Discuss the quantification of dosage units
8. Perform standard synthetic and analytical laboratory procedures relevant to drug substances and drug products.

INTEGRATION
Integration Level: 3 (Harmonisation)
Present in the following Integration Schematics: N/A

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1103 – Links with analysis of pharmaceutical materials, application of analytical techniques e.g. spectroscopy and chromatography
PH1105 – Shares calculation examples; calculations evaluated in OSCE

Vertically across years
PH2101 – Links with pharmaceutical and bioorganic chemistry of materials used in medicines; applications of analytical techniques to pharmaceutical materials
PH2108 – Links with study of the chemical and biochemical characteristics of proteins and carbohydrates

SYLLABUS
The course comprises four sections which are designed to provide the student with a broad understanding of the underlying principles of organic, inorganic and pharmaceutical chemistry which are required by Pharmacy students. It will place appropriate emphasis on the relationship of molecular structure to drug activity and will provide an introduction to the basic reaction mechanisms important to drug design.

COURSE OUTLINE
Lectures, practical laboratory classes and preparation of case studies.

LECTURES
PH1101A: Structure and bonding in simple chemical compounds of relevance to pharmacy (Lectures 1-11: JMQ)
1-3 Introduction to structure and bonding in organic compounds; The Bohr Model; ‘Particle in a box’; Quantum Numbers; The wave equation for the hydrogen atom; ionic and covalent compounds; ionic bonding; covalent bonding; multiple bonds;
4 Shape and polarity of covalent molecules; Introduction to functional groups
5-6 Nomenclature of simple organic molecules; The IUPAC system; The E-Z system
6-8 Introduction to hybridization and stereochemistry; Stereoisomers; Newman projections; Chirality; Absolute Configuration; Diastereomers.
9-11 The concept of the pharmacophore; drug receptor interactions

PH1101B: Nature of functional groups and chemical reactivity in drug molecules (Lectures 12-28: JJW)
12-13 Functional groups in drug molecules, mechanisms for simple organic and bioorganic reactions of relevance to drug molecules; reaction pathways; writing equations for chemical reactions
14-15 Addition reactions to alkenes and carboxyls, nucleophilic aliphatic substitution
16-18 Elimination reactions from alkyl halides together with a basic introduction to electrophilic aromatic substitution reactions
19-21 Aspirin and paracetamol preparation
22-26 Chemical properties of important functional groups in drug molecules of use in predicting drug properties and chemical reactivity
27 Preparation, structures and properties of bioorganic materials (peptides, sugars and lipids)
28 Review of introductory chemistry of organic compounds
29-30 The drug discovery process
31-32 The natural world as a source of drugs
33 Classification of drugs by mechanism, chemical class, physiological effects
34-36 The relationship between structure, metabolism and disposition

PH1101C: Inorganic and analytical chemistry
37-38 Survey of Group Metals relevant to medicines
39 Bonding in transition metal complexes,
40-43 Role of transition metals in living organisms
44 Heavy metal toxicity - cadmium, lead, mercury
45 Oxides of carbon and nitrogen relevant to pharmacy and medicine
46 Pharmaceutical analysis and quantification of dosage units
47-48 Introduction to redox chemistry in pharmaceutical analysis
49 Methods for analysis of metals in pharmaceuticals

PRACTICAL LABORATORY CLASSES:
The practical laboratory course is designed to introduce the students to standard analytical and synthetic laboratory procedures and provide the basic practical skills required for Good Laboratory Practice (GLP) with the objective to produce accurate and reproducible results and to develop the skills required in the synthesis, purification and titrimetric analysis of drugs.

Practical organic chemistry of drugs (JJW)
1. Separation, purification and crystallisation techniques for common NSAID drugs
2. Paracetamol synthesis and pharmacopoeial characterisation
3. Esterification methods for carboxylic acids
4. Aldol condensation reactions
5. Hydrolysis of esters
6. Aspirin: preparation, characterization and pharmacopoeial specifications

Practical inorganic chemistry of drugs: quantification of dosage units. (JMQ)
1. Acid-Base titrimetry: quantification of dosage units; direct and indirect methods
2. Determination of content of boric acid in eye lotion; Determination of aspirin content in tablets and API
3. Redox chemistry in pharmaceutical analysis: Quantitative determination of iron in medicinal products
4. Iodometric analysis: application for determination of iron, ascorbic acid; and iodine value of oil
5. Compleximetric analysis: Determination of Calcium, Zinc, Aluminium and Bismuth in pharmaceutical products
6. Non-aqueous pharmacopoeial quantitative determination of weak acids and weak bases such as sulphadimidine and aniline hydrochloride

Case Studies (JJW, JMQ, SR, TR, MO'D)
Students will work together in small groups to prepare and deliver presentations on specific case studies based on drugs used in the treatment of pain and inflammatory conditions. These studies will require students to draw on their knowledge of material presented in other JF modules.
**DIRECTED READING/Recommended textbooks**


*Foye’s Principles of Medicinal Chemistry,* Williams DA, 7th Ed (2013)

ICHQ6A, Preamble and Scope

*European Pharmacopoeia,* General Notices


*Inorganic Chemistry in Biology,* Wilkins PC & Wilkins RG, Oxford Chemistry Primers

**ASSESSMENT**

Pass mark = 50% unless specified otherwise

Written Theory Paper: 3 hours; all questions are compulsory; 70% of total marks
Section 1: 30 MCQs; (50% of marks)
Section 2: 10 short questions (50% of marks)
Case studies 5% of total marks
Continuous practical assessment (15%) and tests (10%) 25% of total marks

**SUMMARY OF HOURS**

<table>
<thead>
<tr>
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**N.B.:** Students are expected to satisfy the examiners in both written examination and practical components. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit the supplementary examination.

Students who fail to satisfy the written requirement (less than 40%) of the annual examination, will be required to take a supplemental examination in the written component.

Students who fail to satisfy the written requirement (i.e. less than 40%) of the annual examination, but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to take a supplemental examination in the written component.

Students who fail to satisfy the practical requirement (i.e. less than 40% of the practical component), but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to resubmit in the practical component.

*Compensation*

This module is compensatable.
PHYSICAL PHARMACY I
Year 1 (Junior Freshman) MODULE CODE: PH1102

Staff of the School of Pharmacy: Asst. Prof J. Quigley (JQ), Prof. A.M. Healy (AMH), Assoc. Prof L. Tajber (LT)

Coordinator: Asst. Prof. John Quigley

AIMS: To explain physico-chemical aspects of substances used in pharmacy and medicine.

PRE-REQUISITES:
Please see the general pre-requisites.

LEARNING OUTCOMES: On successful completion of this module the student will be able to:
1. Describe the phases of matter with particular reference to pharmaceutical systems
2. Discuss the importance of physicochemical parameters in relation to drug absorption and distribution
3. Explain the theoretical basis of the stability of pharmaceutical agents in solution
4. Describe the concept and theory of surface and interfacial phenomena as applicable to pharmaceutical systems
5. Demonstrate a competence in related practical laboratory skills.

INTEGRATION
Integration Level: 10 (Inter-disciplinary)
Present in the following Integration Schematics: N/A

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1101 – Complements this module, focussing particularly on the Physical Chemical components relevant to the Pharmaceutical Sciences, e.g. solubility, partitioning, stability, interfacial phenomena and adsorption
PH1104 – Provides a basis for understanding issues related to pharmaceutical formulation and compounding

Vertically across years
PH2104 – Fundamental to an understanding of this module
PH4102 – An understanding of stability and reaction kinetics feeds directly into this module

SYLLABUS
Material will be covered on the following topics: Properties of gases, liquids, solids; solubility; thermodynamics; ionisation; drug absorption and distribution; interfaces and surfaces, reaction rate.

COURSE OUTLINE
Lectures and practical laboratory classes.

LECTURES

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Basic principles of Physical Pharmacy – phases of matter, phase rule/diagrams</td>
<td>JQ</td>
</tr>
<tr>
<td>2</td>
<td>Basic principles of Physical Pharmacy – real gases</td>
<td>JQ</td>
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<tr>
<td>3-4</td>
<td>Basic principles of Physical Pharmacy – properties of solids and liquids</td>
<td>JQ</td>
</tr>
<tr>
<td>5-6</td>
<td>Introduction to solubility and its measurement</td>
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<td>7</td>
<td>Solid state properties influencing solubility</td>
<td>LT</td>
</tr>
<tr>
<td>8</td>
<td>Enhancing solubility by ionisation and salt formation</td>
<td>LT</td>
</tr>
<tr>
<td>9</td>
<td>Enhancing solubility – co-solvation</td>
<td>LT</td>
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<td>10-15</td>
<td>Stability of Pharmaceutical systems (Rate Laws, Arrhenius Equation, Collision/TS theories)</td>
<td>JQ</td>
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<tr>
<td>16</td>
<td>Thermodynamics of Pharmaceutical Systems</td>
<td>JQ</td>
</tr>
<tr>
<td>17-19</td>
<td>Ionisation, $pK_a$ Partitioning</td>
<td>JQ</td>
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<tr>
<td>20-21</td>
<td>Drug Absorption and Distribution</td>
<td>JQ</td>
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<tr>
<td>22-23</td>
<td>Interfaces and surfaces: definition &amp; measurement of their tension, surface and interfacial free energy; contact angles &amp; the wetting of solids</td>
<td>AMH</td>
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<tr>
<td>24</td>
<td>Definition, theory and factors affecting adsorption, effect of interfaces, Gibbs adsorption equation</td>
<td>AMH</td>
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<tr>
<td>25-26</td>
<td>Adsorption isotherms, pharmaceutical applications of adsorption</td>
<td>AMH</td>
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</table>
Surface films, film balance studies and uses in Pharmacy;
surfactant uses.

PRACTICAL CLASSES (2 hours each)
1. Solubility relationships of drugs and their metabolites
2. Dependence of reaction rate on concentration and temperature for an oxidation reaction
3. Determination of the critical micelle concentration of sodium lauryl sulphate
4. Determination of lipophilicity constants of sulphonamide substituents

DIRECTED READING

ASSESSMENT
Pass mark = 50% unless specified otherwise

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<tr>
<th>Written paper: 2 hours</th>
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<td>Question 1 (8 short questions)</td>
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<td>Questions 2, 3, 4 (essay type questions)</td>
<td>68% of theory mark</td>
</tr>
<tr>
<td>Practical: Continuous Assessment</td>
<td>15% of total marks</td>
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SUMMARY OF HOURS

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N.B.: Students are expected to satisfy the examiners in both written examination and practical components. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit the supplemental examination.

Students who fail to satisfy the written requirement (less than 40%) of the annual examination, will be required to take a supplemental examination in the written component.

Students who fail to satisfy the written requirement (i.e. less than 40%) of the annual examination, but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required take a supplemental examination in the written component.

Students who fail to satisfy the practical requirement (i.e. less than 40% of the practical component), but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to resubmit in the practical component.

Compensation
This module is compensatable.
PHARMACEUTICAL ANALYSIS 1
Year 1 (Junior Freshman)         MODULE CODE: PH1103

Staff of the School of Pharmacy & Pharmaceutical Sciences:
Assoc. Prof. John J Walsh (JJW), Asst. Prof. A. Sasse (AS), Asst. Prof. F. Boylan (FB),
Asst. Prof. J. Quigley (JQ), Assoc. Prof. J.F. Gilmer (JG)

Co-ordinator: Assoc. Professor John F. Gilmer

PRE-REQUISITES: Please see the general pre-requisites.

COURSE OUTLINE

AIMS: To introduce the concepts of quality, together with appropriate regulatory frameworks and guidance, and the application of analytical techniques to pharmaceutical materials. This module is preparatory for PH2101 in the Senior Freshman year.

LEARNING OUTCOMES: On successful completion of this module the student will be able to:
1. Describe the purpose and scope of pharmaceutical analysis
2. Define identity, potency and purity in the context of pharmaceutical product quality
3. Describe the structure and purpose of a pharmacopoeial monograph
4. Interpret and explain basic spectroscopic data
5. Interpret simple chromatographic data
6. Determine system suitability parameters
7. Conduct simple pharmacopoeial chromatographic assays

INTEGRATION
Integration Level: 3 (Harmonisation)
Present in the following Integration Schematics:
This foundational analysis module is relevant to many modules within the year and across the programme

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1101 – Organic and inorganic chemistry for Pharmacy
PH1102 – Physical Pharmacy 1
PH1104 – Introduction to Pharmaceutics and Formulation

Vertically across years
PH2101 – Properties of materials used in medicines
PH3102 – Common themes (drug structure, chemistry, structure/activity relationships, methods of drug analysis) revisited with progressive complexity
PH3103 – Naturally occurring anticancer agents
PH3111 – Drugs and medicines in the treatment of malignancy;
MPH5101 – Industrial Pharmacy

SYLLABUS
Material will be covered on the following topics: Scope of pharmaceutical analysis, concepts of identity, purity, potency; assay design; atomic and molecular spectroscopy; chromatography; pharmacopoeia.

COURSE OUTLINE
Lectures and practical laboratory classes.

LECTURES

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topic</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Scope of pharmaceutical analysis, pharmaceutical materials, and context</td>
<td>AS</td>
</tr>
<tr>
<td>2</td>
<td>The concepts of identity, potency, purity, pharmacopoeial monographs</td>
<td>AS</td>
</tr>
<tr>
<td>3-4</td>
<td>Assay design, units used in pharmaceutical analysis, uniformity of content analysis</td>
<td>JQ</td>
</tr>
<tr>
<td>5-6</td>
<td>Introduction to atomic spectroscopy (AES, AAS)</td>
<td>AS</td>
</tr>
<tr>
<td>7-8</td>
<td>Introduction to molecular spectroscopy (UV-Vis)</td>
<td>AS</td>
</tr>
<tr>
<td>9-11</td>
<td>Introduction to separation science and chromatography (TLC)</td>
<td>JJW</td>
</tr>
<tr>
<td>12-13</td>
<td>Pharmaceutical/pharmacopoeial applications of TLC</td>
<td>FB</td>
</tr>
</tbody>
</table>
14-16 Introduction to column and gas chromatography (GC) JW
17-18 Pharmaceutical/pharmacopoeial applications of GC FB
19-20 Theory and methodology of HPLC JJW
21 Pharmaceutical/pharmacopoeial applications of HPLC FB

PRACTICAL CLASSES (3 hours each)
1 Introduction to Thin Layer and Flash Column Chromatography
2 Gas Chromatography practical – and quantitative analysis
3 Introduction to High Performance Liquid Chromatography

DIRECTED READING
ICHQ6A, Preamble and Scope
European Pharmacopoeia, General Notices
General Chemistry-Atoms first, McMurry-Fay, 2nd Edition 2012

ASSESSMENT
Pass mark = 50% unless specified otherwise

Written theory paper: 2 hours 80%
Four questions; all compulsory and all are equally weighted.
Question 1 consists of 5 parts (answer 4 from 5).
Continuous assessment of practical reports. 20%

SUMMARY OF HOURS

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Practicals</th>
<th>Tutorials</th>
<th>Total contact</th>
<th>Practical reports</th>
<th>Guided study</th>
<th>TOTAL</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>12</td>
<td>2</td>
<td>35</td>
<td>8</td>
<td>50</td>
<td>93</td>
<td>5</td>
</tr>
</tbody>
</table>

N.B.: Students are expected to satisfy the examiners in both written examination and practical components. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit the supplemental examination.

Students who fail to satisfy the written requirement (less than 40%) of the annual examination, will be required to take a supplemental examination in the written component.

Students who fail to satisfy the written requirement (i.e. less than 40%) of the annual examination, but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required take a supplemental examination in the written component.

Students who fail to satisfy the practical requirement (i.e. less than 40% of the practical component), but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to resubmit in the practical component.

Compensation
This module is compensatable.
INTRODUCTION TO PHARMACEUTICS AND FORMULATION
Year 1 (Junior Freshman)  

MODULE CODE: PH1104

Staff of School of Pharmacy & Pharmaceutical Sciences: Assoc. Prof. C. Ehrhardt (CE), Prof. A. M. Healy (AMH)  
External Staff: Ms. M. Flannery (MF), Mr. G. Hanley (GH)

Coordinator: Assoc. Professor Carsten Ehrhardt

AIMS: To provide an introductory course in Pharmaceutics, so that students may understand the importance and relevance of the subject area to their studies for a Degree in Pharmacy and in subsequent practice, and to be better able to participate in and benefit from work experience in community or another branch of Pharmacy.

PRE-REQUISITES:  
Please see the general pre-requisites.

LEARNING OUTCOMES: On successful completion of this module the student will be able to:
1. Articulate the importance of Pharmaceutics for their studies in Pharmacy and subsequent practice
2. Select and use appropriate common reference textbooks in hard copy and electronic format and describe the content thereof
3. Recall the basic principles of formulation, with particular reference to simple liquid preparations such as solutions and suspensions, topical products such as gels and pastes and solid dosage forms such as capsules and suppositories
4. Prepare simple extemporaneous preparations such as solutions, suspensions, gels, pastes, capsules and suppositories, and show competency in performing common pharmaceutical calculations of relevance in pharmaceutical formulation and compounding
5. Discriminate between pharmaceutical grades of water
6. Appreciate the importance of proper packaging and labelling of medicines

INTEGRATION
Integration Level: 4 (Nesting)
Present in the following Integration Schematics:
Theme 1: Example 2

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1105 – Essential to understanding of extemporaneous compounding
PH11P6 – Links extemporaneous compounding to supply on prescription (labelling, packaging, counselling requirements, etc.)

Vertically across years
PH1104 and PH2104 – Development of competence in practical laboratory skills; progressive complexity of skills required.

SYLLABUS
Material will be covered on the following topics: Pharmaceutical calculations; formulation; liquid and solid pharmaceutical preparations; hydrogels; packaging.

COURSE OUTLINE
Lectures, tutorials and practical laboratory classes.
LECTURES
1. Introduction to Pharmaceutics
2. Introduction to essential reference books
3. Discussion of reference books, including Pharmacopoeia and Martindale
4-6. Pharmaceutical calculations relating to pharmaceutical formulation & compounding
7. Introduction to basic principles of formulation
8-9. Water – potable and purified
10-11. Design and preparation of solutions for oral administration
12-13. Design and preparation of suspensions
14-16. Hard capsules, formulation, production and quality control
17. Soft capsules, formulation, production and quality control
18-20. Rectal dosage forms, suppository formulation, production and quality control
21-22. Introduction to hydrogels, formulation and production
23-24. Packaging of medicines

LECTURER
CE
AMH
AMH
AMH
CE
AMH
CE
CE
CE
MF/GH

PRACTICAL CLASSES
1. Introduction to extemporaneous compounding and dispensing (2 h)
2. Pharmaceutical solutions 1 (2 h)
3. Pharmaceutical solutions 2 (3 h)
4. Pharmaceutical suspensions (3 h)
5. Solid dosage forms - capsules (3 h)
6. Solid dosage forms - suppositories and pessaries (3 h)
7. Topical semisolid products – gels and pastes (3 h)
8. Practice-based formulation exercises (3 h)
9. Practical examination preparation (3 h)
10. Repeat and revision (3 h)

TUTORIAL
Pharmaceutical formulation and calculation (AMH/CE).

DIRECTED READING
European Pharmacopoeia
British Pharmacopoeia
Martindale

ASSESSMENT
Pass mark = 50% unless specified otherwise

Written theory paper: 2 hours; MCQ and short answer questions (all compulsory) 50% of total marks
Practical examination: 2.5 hours; 3 questions (no choice) 50% of total marks
N.B.: Students are expected to satisfy the examiners in both written examination and practical components. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit the supplemental examinations in both the theory and practical exam.

Students who fail to satisfy the written requirement (less than 50%) of the annual examination, will be required to take a supplemental examination in the written component.

Students who fail to satisfy the practical requirement (less than 50%) of the annual examination, will be required to take a supplemental examination in the practical component.

Students who fail to satisfy the written requirement (i.e. less than 50%) of the annual examination, but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required take a supplemental examination in the written component.

Students who fail to satisfy the practical requirement (i.e. less than 50% of the practical component), but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to take a supplemental practical examination.

Compensation
This module is not compensatable.
MATHEMATICAL METHODS & PHARMACEUTICAL CALCULATIONS

Year 1 (Junior Freshman)  MODULE CODE: PH1105

Staff of School of Pharmacy & Pharmaceutical Sciences: Asst. Prof. J. Quigley (JQ), Assoc. Prof. C. Ehrhardt (CE), Asst. Prof. A. Sasse (AS), Asst. Prof. S. Ryder (SR), Assoc. Prof. L. Tajber (LT)

External Staff/School of Mathematics: Dr. Joe Hogan (JH)

Coordinator: Asst. Prof. John Quigley (JQ)

AIMS: To explain basic techniques in Applied Mathematics and Introductory Statistics and calculations of relevance to Pharmacy.

PRE-REQUISITES: Matriculation Requirements and in Mathematics at Leaving Certificate an Ordinary Level grade C or Higher Level grade D or grade B at GCSE level.

LEARNING OUTCOMES: On successful completion of this module the student will be able to:
1. Use differential and integral calculus and develop systems of linear equations
2. Explain the fundamental theory of statistical analysis
3. Perform calculations relevant to Pharmaceutical Practice
4. Determine the derivation of relevant kinetic data as applicable to pharmaceutical systems

INTEGRATION
Integration Level: 10 (Inter-disciplinary)
Present in the following Integration Schematics: N/A

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1101 – Enhances understanding of PH1101A Lectures
PH1102 – Essential to understanding of topics taught in this module
PH1104 – Essential to understanding of pharmaceutical calculations
PH11P6 – A proficiency in pharmaceutical calculations is require

Vertically across years
PH2101, PH2104, PH2106 – Fundamental to these modules
PH3102, PH3104, PH3106 – A proficiency in Pharmaceutical Calculations is required
PH4101, PH4102, PH4105 – An understanding of quantitative aspects of medicinal chemistry, statistics and pharmacokinetics

SYLLABUS
Material will be covered on the following topics: Statistics; probability distributions; rate laws; pharmaceutical calculations; prescription compounding; formulation calculations.

COURSE OUTLINE:
Lectures, tutorials and practical classes.

PH1105A: MATHEMATICAL METHODS given by staff of the School of Mathematics:
24 Lectures (JH)
- Differential and Integral calculus (linear, exponential, logarithmic and trigonometric relationships)
- Differential equations (1st & 2nd order)
- Algebra; Systems of linear equations

PH1105B: INTRODUCTORY STATISTICS & PHARMACEUTICAL CALCULATIONS
14 Lectures (JQ)
- Random & Discrete variables; Population Parameters & Pharmaceutical Statistics
- Probability Distributions (Poisson & Binomial)
- The Normal (Gaussian) Distribution; Properties & Applications; Cumulative Frequency Curve (Applications & Calculations)
- Derivation of the Rate Laws
- Prescription Compounding and Formulation Calculations; Dilution, Concentration & Alligation; Isotonic & Electrolyte Solutions
• Bioavailability & Bioequivalence; Drugs in different forms; Reconstitution for Oral and Parenteral use
• Isotonicity

3x 2h Tutorials (AS, SR, LT)
• Pharmaceutical Calculations

Online Exercises (Blackboard Learn): 6 hours
• Use of Excel; Data Presentation and Analysis; Plotting; Error Estimation;
• Statistical Analysis of repeated measurements; Uniformity of Content & Weight

DIRECTED READING

ASSESSMENT
Pass mark = 50% unless specified otherwise

Written theory paper: 2 hours; 3 sections, all questions to be answered
Section A (PH1105B Statistics & Calculations): 2 questions 40% of written paper
Section B (PH1105B Calculations): 1 question 20% of written paper
Section C (PH1105A Maths Methods): 2 questions 40% of written paper

Overall of 92% weighting for the module

Continuous Assessment:
*Two term tests 4%
Exercise 4%

*Students will be required to attain a mark of at least an average mark of 70% in these Pharmaceutical calculations tests (comprising 10 questions each). Otherwise, they will be required to present for a further examination (pass mark 70%) prior to the Annual Examination session (comprising 20 questions). The use of calculators will be disallowed. No compensation is allowed in this element of the module assessment.
Facility with simple pharmaceutical calculations, with a mark of a minimum of 70% in Pharmaceutical Calculations Test(s), is a pre-requisite for entry into the Senior Freshman year.

Please note that relevant material from PH1103 & PH1104 will also be assessed in the Pharmaceutical Calculations Tests and Examination.

OVERALL WEIGHTING:

<table>
<thead>
<tr>
<th>Written Paper</th>
<th>Continuous Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>92%</td>
<td>8%</td>
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SUMMARY OF HOURS

<table>
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<tr>
<th>Lectures</th>
<th>Total contact</th>
<th>Online Exercise &amp; Practical reports</th>
<th>Guided study</th>
<th>TOTAL</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>44</td>
<td>6</td>
<td>70</td>
<td>120</td>
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</tr>
</tbody>
</table>

Compensation
This module is not compensatable.
PRACTICE OF PHARMACY I
Year 1 (Junior Freshman)  MODULE CODE: PH11P6

Staff of the School of Pharmacy & Pharmaceutical Sciences: Assoc. Prof. M. Henman (MH), Asst. Prof. S. Ryder (SR), Asst. Prof. Máire O’Dwyer (MO’D), Assoc. Prof. C. Roche (CR), Assoc. Prof. T. Grimes (TG), Asst. Prof. F. Boylan (FB), Asst. Prof. Theo Ryan (TR), Asst. Prof. Astrid Sasse (AS). Problem-based learning sessions are facilitated by a range of School staff.

Teacher-practitioners: Boots Teacher Practitioner (BTP)
External contributors: Librarian, Dr. T. O’Connor - Student Learning Development (TOC), Pharmaceutical Society of Ireland (PSI)

Coordinator: Asst. Professor Máire O’Dwyer

Aims
This module aims to introduce students to all aspects of pharmacy practice, including clinical skills, professionalism and ethics, social and administrative pharmacy, communication skills, dispensing and patient care. It is also designed to increase students’ awareness of pharmacists’ roles within the healthcare system, to inculcate a professional approach to pharmacy practice and to develop students’ problem-solving skills.

Learning outcomes
On successful completion of this module, students should be able to:
1. Describe the drug use process, pharmaceutical care, health promotion, the characteristics of community and hospital pharmacy practice in Ireland, typical care paths in these settings, the healthcare professionals involved and the organisation of the health services.
2. Describe the sequence of events in drug development, production and marketing, identify the regulatory bodies that are relevant to pharmacy, pharmacists and pharmaceuticals, and provide an overview of the regulation of product authorisation, drug distribution and supply in Ireland.
3. Identify the characteristics of a profession, discriminate between action options open to a pharmacist when faced with professional dilemmas, justify preferred options with respect to professional responsibilities and consider principlism as a framework for professional decision-making.
4. Identify relevant medicine supply schemes when presented with a prescription, provide advice to a patient or prescriber on how these schemes operate, and dispense mock prescriptions or respond to patients’ needs in a legal, safe and professional manner using suitable information resources.
5. Describe the communication process and the structuring of explanations.
6. Systematically collect, interpret and apply knowledge about patients, their conditions and their medicines, in order to provide and justify treatment recommendations and patient counselling, in a diverse range of patient case studies.
7. Work effectively in a team to analyse a problem, identify resources to address it, develop and present an agreed solution, and participate in peer evaluation.
8. Identify and critically reflect upon the domains, competencies and behaviours in the Pharmaceutical Society of Ireland’s Core Competency Framework for Pharmacists that are associated with individual pharmacy activities.
9. In a reflective and cyclical manner, undertake self-appraisal, generating a personal profile of competence and learning needs, prepare a personal development plan, undertake and document development activities and evaluate the outcomes, recording evidence of competence/knowledge that has been gained.

INTEGRATION
Integration Level: 4 (Nesting)
Present in the following Integration Schematics:
Theme 1: Example 1, Example 2, Example 4

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1104 – Links extemporaneous compounding to supply on prescription (labelling, packaging, counselling requirements etc.)
PH1105 – Shares calculation examples; calculations evaluated in OSCE
PH1109 – Links to basic principles in pharmacokinetics and pharmacology.

Vertically across years
PH2106, PH3106 – Common themes (dispensing, clinical skills, counselling) revisited with progressive complexity.

Syllabus

40
Material will be covered on the following topics: the roles and responsibilities of pharmacists, the institutions of pharmacy and the organisation of the health service, the structure and operation of community and hospital practices, the manufacture and supply of medicines, the law relating to medicines, medicine supply schemes and prescription dispensing, communication skills, professionalism and the implications of being a professional, ethics, clinical skills and alternative systems of medicine.

COURSE OUTLINE:
Lectures, tutorials, team-based and problem-based learning workshops, peer review, practical classes, online activities, workplace-based learning.

*Note: Due to timetabling constraints, the sequence of classes may differ from that below.*

**LECTURES (24 hours)**

<table>
<thead>
<tr>
<th>Lectures (24 hours)</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>MH</td>
</tr>
<tr>
<td>3</td>
<td>SR</td>
</tr>
<tr>
<td>4-5</td>
<td>CR</td>
</tr>
<tr>
<td>6</td>
<td>CR</td>
</tr>
<tr>
<td>7</td>
<td>CR</td>
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<tr>
<td>8</td>
<td>CR</td>
</tr>
<tr>
<td>9</td>
<td>CR</td>
</tr>
<tr>
<td>10</td>
<td>MH</td>
</tr>
<tr>
<td>11-12</td>
<td>MH</td>
</tr>
<tr>
<td>13</td>
<td>MH</td>
</tr>
<tr>
<td>14-15</td>
<td>FB</td>
</tr>
<tr>
<td>16-17</td>
<td>BTP</td>
</tr>
<tr>
<td>18-20</td>
<td>M’OD</td>
</tr>
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<td>21-23</td>
<td>M’OD</td>
</tr>
<tr>
<td>24</td>
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</tbody>
</table>

**PRACTICAL CLASSES / WORKSHOPS (50 hours)**

<table>
<thead>
<tr>
<th>Practical Classes / Workshops (50 hours)</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics: Introduction to principlism (2h)</td>
<td>CR</td>
</tr>
<tr>
<td>Professionalism in pharmacy practice (2h)</td>
<td>CR</td>
</tr>
<tr>
<td>Introduction to EPortfolio (2h)</td>
<td>SR</td>
</tr>
<tr>
<td>Health informatics – applied literacy skills (1h)</td>
<td>Librarian</td>
</tr>
<tr>
<td>Approaches to Learning (1h)</td>
<td>TOC</td>
</tr>
<tr>
<td>Academic writing and presentation skills (1h)</td>
<td>TOC</td>
</tr>
<tr>
<td>Workshop (1h)</td>
<td>AS</td>
</tr>
<tr>
<td>Introduction to problem based learning (PBL) methods (1h)</td>
<td>MH</td>
</tr>
<tr>
<td>Exploration of pharmacy cases through PBL (10h)</td>
<td>MH/MO’D/others</td>
</tr>
<tr>
<td>PBL group presentations and peer assessment (3h)</td>
<td>MH/MO’D</td>
</tr>
<tr>
<td>Practical 1.1:Communication skills (2h)</td>
<td>BTP</td>
</tr>
<tr>
<td>Practical 1.2 Responding to Requests for Prescription Only Medicines (POM)</td>
<td>MO’D</td>
</tr>
<tr>
<td>Practical 1.3: Responding to requests for OTC medicines (2h)</td>
<td>MO’D</td>
</tr>
<tr>
<td>Practical 1.4: Responding to symptoms (2h)</td>
<td>MO’D</td>
</tr>
<tr>
<td>Practical 1.5: Discussion of experiential learning and CCF Live (deb briefing and learning consolidation) (2h)</td>
<td>BTP/TR</td>
</tr>
<tr>
<td>Practical 1.6: Introduction to pharmacy software and Dispensing and Patient Care(3h)</td>
<td>SR/MO’D</td>
</tr>
<tr>
<td>Practical 1.7: Dispensing and Patient Care: Introduction to prescriptions, use of reference sources, medicines schemes (2.5h)</td>
<td>SR/BTP/TG/MO’D/</td>
</tr>
<tr>
<td>Practical 1.8: Dispensing and Patient Care (2.5h)</td>
<td>SR/BTP/CR/TG/MO’D/</td>
</tr>
<tr>
<td>Practical 1.9: : Dispensing and Patient Care(2.5h)</td>
<td>SR/BTP/CR/TG/MO’D</td>
</tr>
<tr>
<td>Practical 1.10: : Dispensing and Patient Care (2.5h)</td>
<td>SR/BTP/CR/TG/MO’D</td>
</tr>
<tr>
<td>Practical 1.11: :Introduction to objective structured clinical examination (OSCE) (1h)</td>
<td>SR</td>
</tr>
<tr>
<td>Preparation for OSCE (2h)</td>
<td>SR/MH/ BTP</td>
</tr>
<tr>
<td>Pharmacy practice practical test (1h timetabled; test duration: 50 mins)</td>
<td>SR/ BTP /CR/TG/MO’D</td>
</tr>
<tr>
<td>Assessment by OSCE (2h)</td>
<td>SR/MH/ BTP</td>
</tr>
</tbody>
</table>
**Code of Conduct and Intermediate Concept Assessments (1hr)**

**TUTORIALS (4 hours)**
- Practical 1.7 feedback (1h)
- Practical 1.8 feedback (1h)
- Practical 1.9 feedback (1h)
- Practical 1.10 feedback (1h)

**WORKPLACE-BASED LEARNING (16 hours)**
- Community pharmacy practice: pharmacy layout and organisation; staff roles and responsibilities; clinical activities (dispensary, pharmacy counter, consultation room) (2h)
- Patient-facing experience; Core Competency Framework Live [CCF Live] activities (14h, as two days full-time)

**Optional Additional Component**
- First Aid Course (Certificate Evening Course), St. John’s Ambulance Service

**Assessment**
- Pass mark = 50% unless specified otherwise. Each component must be passed independently.

<table>
<thead>
<tr>
<th>Component</th>
<th>Contribution to module grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written examination: 2 hours. Section A: 2 long questions (no choice; may have multiple subsections). Section B: 50 MCQs (no choice; negative marking, +1/-0.25). Students must attain at least 40% in Section A and at least 40% in Section B, as well as at least 50% in the paper overall.</td>
<td>70%</td>
</tr>
<tr>
<td>Dispensing and patient care coursework (minimum 60% for each practical worksheet)</td>
<td>10%</td>
</tr>
<tr>
<td>Pharmacy practice practical test; minimum 60% and no level 1 errors.</td>
<td>5%</td>
</tr>
<tr>
<td>Level 1 error: Automatic failure of the entire test, irrespective of the marks awarded.</td>
<td></td>
</tr>
<tr>
<td>Level 2 error: Zero marks for the question in which the error is made.</td>
<td></td>
</tr>
<tr>
<td>Level 3 error: Deduction of 41% of the maximum marks available for the question in which the error is made.</td>
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<tr>
<td>Level 4 error: Deduction of 20% of the maximum marks available for the question in which the error is made.</td>
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<tr>
<td>Level 5 error: Deduction of 10% of the maximum marks available for the question in which the error is made.</td>
<td></td>
</tr>
<tr>
<td>Level 6 error: Deduction of 5% of the maximum marks available for the question in which the error is made.</td>
<td></td>
</tr>
<tr>
<td>Social and administrative pharmacy group exercise,</td>
<td>5%</td>
</tr>
<tr>
<td>Problem based learning: 2.5% group mark, 2.5% individual mark (peer reviewed)</td>
<td>5%</td>
</tr>
<tr>
<td>Continuous assessment in clinical skills</td>
<td>5%</td>
</tr>
<tr>
<td>Continuous assessment in communication skills, (satisfactory/unsatisfactory)</td>
<td></td>
</tr>
<tr>
<td>Professionalism and Ethics: completion of DIT2 and assignments related to workshops, and completion of Code of Conduct and Intermediate Concept (ICM) assessments (satisfactory/unsatisfactory)</td>
<td></td>
</tr>
<tr>
<td>Objective structured clinical examination (OSCE) and associated exercises (satisfactory/unsatisfactory)</td>
<td></td>
</tr>
<tr>
<td><strong>CCF Live 1</strong> and reflective continuing professional development e-portfolio (satisfactory/unsatisfactory)</td>
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</tbody>
</table>

**NB:** Students will be expected to draw upon knowledge and skills gained in this module both in other clinically focused modules in the current year and wherever relevant in all subsequent years of the programme (e.g. in the clinical pharmacy assessments linked to pharmacology and therapeutics components, Practice of Pharmacy theory papers, clinical skills exercises, dispensing and patient care evaluations, practical tests, competence assessments and performance appraisals [CAPAs], OSCEs and the professional registration examination).

**Bibliography**
- Irish Medicines Formulary
- British National Formulary
- IPHA Summary of Product Characteristics (SmPC) Compendium ([www.medicines.ie](http://www.medicines.ie)) and SmPCs on the Irish Medicines Board website ([www.imb.ie](http://www.imb.ie))

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CR/TG/MO'D
SUMMARY OF HOURS (excludes workplace-based learning)

<table>
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<tr>
<th>Lectures</th>
<th>Practicals/Workshops</th>
<th>Tutorials</th>
<th>Contact hours</th>
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Pass mark, plagiarism
The pass mark for examinations and assessments is 50% except where otherwise indicated. See ‘Assessment’ above. Students should note that College penalties for plagiarism apply to both examinations and continuous assessment.

Late work
Continuous assessment exercises for this module must be presented for evaluation by the specified date(s). They must be presented to a designated member of staff in the manner requested (e.g., in person/by email/through the virtual learning environment), and signed in on the form for this purpose where applicable. Work submitted late will not be assessed unless a valid reason is provided, and permission for late submission should be obtained in advance of the submission deadline from the staff member responsible for the continuous assessment component. Where late work with a valid excuse is accepted for assessment, a penalty may be applied (deduction of up to 50% of the maximum marks available for the component) with the effect that marks for the late work will not normally exceed the pass mark.

Missed classes/assessments
In common with other modules for the pharmacy degree, attendance at all scheduled classes for this module is compulsory. A student who is unable to attend a class for any reason must notify his/her tutor of the reason for absence without delay, and present certification as appropriate. However, all continuous assessment components must be completed even if the student is absent for a valid reason. It is the student’s responsibility to obtain details of the assessment for the missed class(es) from the relevant staff member without delay, and to complete it on a self-study basis. The deadline for submission of the completed assessment to the relevant staff member is five days from the student’s return to College (return date notified to staff member by tutor, based on certification as appropriate) unless otherwise agreed in advance with the relevant staff member. Where feedback on the assessment has already been provided to the class prior to submission, a penalty may be applied (deduction of up to 50% of the maximum marks available for the assessment), with the effect that marks for the assessment will not normally exceed the pass mark. See above for late submissions.

Progression and supplementals
Students must satisfy the examiners in each component of the module independently. A student may be returned as a ‘qualified fail’ (QF) and refused permission to progress with his/her class until he/she has satisfied the examiners in all components of the module. This may necessitate sitting a supplemental examination and/or repetition/(re)submission of one or more continuous assessment components (including submission of one or more alternative exercises that have been set to replace failed/missed continuous assessment components). In such circumstances, while the marks attained in a supplemental theory examination will not be capped, penalties may be applied to continuous assessment components including supplemental practical tests (deduction of up to 50% of the maximum marks available for the relevant element(s)), with the effect that marks for such elements will not normally exceed the pass mark.

Non-satisfactory reports
Students who have not fulfilled the module requirements with regard to attendance and/or coursework may be reported to the Senior Lecturer as non-satisfactory for one or more terms. Students reported as non-satisfactory for the Michaelmas and Hilary terms may be refused permission to take their annual examinations and may be required by the Senior Lecturer to repeat the year.
Professional dress code
Students are required to dress appropriately and behave in a professional manner for elements of the course entailing attendance at external facilities (professional experience in pharmacies, case review in hospitals, health service facilities etc.).

Compensation
This module is not compensatable.
GENERAL PRINCIPLES OF PHARMACOLOGY
Year 1 (Junior Freshman)  

Staff of the School of Pharmacy & Pharmaceutical Sciences: Assoc. Prof. A. Harkin

Coordinator: Assoc. Professor Andrew Harkin

Aims
This module aims to introduce the student to the basic principles of pharmacology, drug development and experimental techniques used in pharmacology.

Learning outcomes
On successful completion of this module, students should be able to:
1. State the variety of targets to which drugs bind in the body and illustrate their transduction and cell signaling mechanisms
2. Define agonist (full, partial and inverse), antagonist (competitive and non-competitive) and recall selected examples of each
3. Analyse receptor binding experiments and deduce the receptor binding parameters $B_{\text{MAX}}$ and $K_{D}$
4. Construct dose response curves and calculate drug potency of both agonists and antagonists
5. Illustrate the principles of drug absorption, distribution, metabolism and excretion and define the terms, $pK_{a}$, bioavailability, volume of distribution, clearance, half-life, and Kel.
6. Illustrate the organisation and mode of neurotransmission within the sympathetic, para sympathetic, enteric and somatic nervous systems
7. Describe the mechanisms of action and clinical uses of cholinergic and adrenergic drugs within the peripheral nervous system
8. Define the key steps associated with excitatory and inhibitory neurotransmission in the brain and provide selected examples of drugs which influence these steps
9. Describe the various stages of drug discovery, development and the clinical trials process

INTEGRATION
Integration Level: 3 (Harmonisation)

Present in the following Integration Schematics:
Theme 2: Example 1
Theme 3: Example 1
Theme 4: Example 1

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH1101 – Links with drug receptor interactions and drug discovery process
PH11P6 – Builds on physicochemical parameters in relation to drug absorption and distribution in pharmacokinetics and pharmacokinetic modelling
BY1P02, BIPH01, PH1109 – compliments and builds on cell and molecular biology, biochemistry and physiology for understanding, mechanisms of disease, drug action and safety in the body

Vertically across years
PH2110, 2111, 3109, 3110, 3111, 3112, 4112 – Lays foundation for all subsequent modules in Pharmacology
PH2104 – Development of competence in practical laboratory skills
PH2108 – Introduction to drug discovery and development with reference to bio-therapeutics
PH3102, PH3103 – Introduction to drug targets including nuclear receptors, cholinergic and adrenergic receptors and pharmacology of drugs obtained from natural sources

SYLLABUS
Material will be covered on the following topics: targets of drug action; dose response, drug metabolism, pharmacokinetics, and neurotransmission.

COURSE OUTLINE
Lectures, tutorials, and practical laboratory classes incl. computer-simulated experiments.
LECTURES (AH)
1. Introduction to Pharmacology
2. Targets of drug action.
3. Receptors (ligand gated ion channels)
4. Receptors (G protein coupled, kinase linked and intracellular receptors)
5-6. Dose response; agonism and antagonism
7. Therapeutic and toxic doses
8. Overview of pharmacokinetic processes; absorption and distribution
9. Drug metabolism and excretion
10. Pharmacokinetic modelling
11. Neurotransmission
12. Autonomic nervous system
13. Cholinergic transmission
14. Cholinergic agents; anticholinesterases
15. Muscarinic blockers; ganglionic blockers
16. Adrenergic transmission
17. Direct/indirect sympathomimetics; αβ-stimulants
18. NANC transmitters
19. Somatic system and skeletal neuromuscular blocking agents
20. Excitatory neurotransmitters in the central nervous system
21. Inhibitory neurotransmitters in the central nervous system
22-23. Monoaminergic neurotransmission
24. Peptide transmitters
25-26. Drug design, development and testing

PRACTICAL CLASSES (3 hours each)
1. Drug targets and receptor transduction
2. Introductory Pharmacokinetics Workshop. Computer simulated experiments and data analysis
3. Dose response – the guinea pig ileum preparation. Computer simulated experiments and data analysis
4. Quantifying Antagonist Activity – the pA2 scale: Computer simulated experiments and data analysis
5. Receptor Binding Workshop
6. Clinical Trials

TUTORIALS: (1 hour)
Course review.

ASSESSMENT
Pass mark = 50% unless specified otherwise

Written paper (2 hours)
   Part 1: three essay questions out of five (54%)
   Part 2: 20 MCQ (36%)
Continuous practical assessment, incl. five assignments (2% each)

Weighting

90%
10%

Bibliography
- Rang and Dale’s Pharmacology (7th Ed.) by H.P. Rang, M.Maureen Dale, Churchill Livingstone (2011)
  by Kenneth P. Minneman
- The Biochemical Basis of Neuropharmacology, 8th Ed., J. R. Cooper, F. E. Bloom, R. H. Roth, OUP USA (2002)

SUMMARY OF HOURS

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Tutorials</th>
<th>Practicals</th>
<th>Total contact</th>
<th>Practical reports</th>
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Compensation
This module is compensatable.
SENIOR FRESHMAN (2\textsuperscript{nd} Year)

Module details may be subject to corrections/amendments.

- \textit{It is each student's responsibility to be aware of dates, times, locations, etc. of lectures, tutorials, seminars and practical classes.}

- \textit{Reports, continuous assessments and laboratory notebooks must be presented for assessment by the date specified by the examiner.}

- \textit{Reports, continuous assessments and laboratory notebooks submitted after the specified date will not be assessed unless a valid reason is given, and students will be deemed not to have satisfied the School's examination requirements.}

**PRE-REQUISITES:** Successful completion of Junior Freshman (Year 1)
PROPERTIES AND ANALYSIS OF MATERIALS USED IN MEDICINES

Year 2 (Senior Freshman)  Code: PH2101
Staff of the School of Pharmacy & Pharmaceutical Sciences: Assoc. Prof. J. Gilmer (JG), Asst. Prof. A. Sasse (AS).

Co-ordinator: Associate Professor John Gilmer

AIMS: To develop and consolidate fundamental pharmaceutical and bioorganic chemistry of the materials used in medicines from first year with emphasis on more advanced topics. Stereochemistry is introduced, the chemistry of some important heterocycles is covered, as is polymer chemistry relevant to pharmacy. The module also aims to reinforce the concepts of quality, together with appropriate regulatory frameworks and guidance, and the application of analytical techniques to pharmaceutical materials (this is a continuation of the course given at JF level).

PRE-REQUISITES: Successful completion of Junior Freshman (Year 1)

LEARNING OUTCOMES: On successful completion of this module the student will be able to:

1. Describe the characteristics of pharmaceutical materials containing conjugated and aromatic systems and consolidate ideas about chemical bonding and its representation.
2. Explain the reactivity of benzene compounds and metabolism using mechanistic conventions.
3. Explain what an azo bond is and how the group behaves in vivo.
4. Discuss the process of ionization in acids and bases and electronic and structural factors that affect equilibria.
5. Identify amine salts and describe their role in solubilization and stabilization.
6. Discuss why shape is important in drug molecules.
7. Describe how stereochemistry is classified, analysed and how it is accommodated in pharmaceutical science and regulations.
8. Explain what a heterocycle is and describe their chemistry and importance in pharmacy.
9. Explain and illustrate the structure, stereochemistry, chemical reactivity and medical use of carbohydrates.
11. Discuss the regulatory framework for specifications of drug substances and products.
12. Discuss the theory and evaluate the application of spectroscopic techniques in pharmaceutical analysis (e.g. IR, UV, NMR and MS).
13. Interpret and predict spectral data of drug molecules and deduce the structural fragments/functional groups and their molecular structure of a drug from spectral data.

INTEGRATION
Integration Level: 3 (Harmonisation)

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH2104 - Physical Pharmacy, Formulation and Pharmaceutical Technology, structural features of drugs influencing their physical properties incl. solubility, stability etc.
PH2108 – Pharmaceutical Biochemistry and Biotechnology, structure and behaviour of cofactors, influence of stereochemistry on drug efficacy and safety

Vertically across years
PH3102 – Common themes (drug structure, chemistry, structure/activity relationships, methods of drug analysis) revisited with progressive complexity.
PH4102 – Application of pharmaceutical/medicinal chemistry in drug design, discovery and development of medicines
PH3111 – Drugs and medicines in the treatment of malignancy;
PH3103 – Naturally occurring Anticancer agents
PH5104 – Advanced polymers for drug delivery of anticancer drugs, design of antisense drugs
SYLLABUS
Material will be covered on the following topics: Pharmaceutical chemistry of aromatic materials, chiral compounds and sugars. Pharmaceutical spectroscopy (UV, IR, NMR and MS).

COURSE OUTLINE:
Lectures, tutorials, computer-assisted learning (CAL) and practical laboratory classes.

Section 1 Pharmaceutical chemistry of aromatic materials and polymers (JG and AS)
1. Review of bonding and electronic structure of unsaturated molecules
2. Conjugation; thermodynamic and reactivity issues
3. MO Theory and modelling of pharmaceutically relevant compounds
4. Aromaticity, stability, electronic structure, 4n+2 rule, quasi-aromatics
5. Electrophilic aromatic substitution, aromatic metabolism in drug clearance and cancer
6. Directing effects in electrophilic substitution
7. Azo compounds, the diazonium reaction, azocoupling, applications in pharmaceutical analysis and drug delivery
8. Amine drugs, the concepts of basicity, relationship between pH, lipophilicity and diffusion
9. Factors affecting amino drug basicity and diffusion
10. Acidity in drugs, review of pKa and relationship to electronic structure
11. Acid derivatives: stability, reactivity, amides, ester drugs and their interactions
12. Free radical chemistry and antioxidants in health and disease
13. Acetals and ketals, the concept of the protecting group
14. Classification and stereochemistry of carbohydrates (AS)
15. Identification reactions for carbohydrates (AS)
16. Reactivity and degradation of carbohydrates (AS)
17. Mono- and disaccharides: structure and physico-chemical characteristics (AS)
18. Definition and concepts of stereochemistry, nomenclature, single and multiple chiral centres (AS)
19. Sources, production and characterization of chiral drugs (AS)
20. Pharmacology of chiral drugs (AS)
21. Regulatory aspects of chiral drugs (AS)
22. What is a heterocycle? distribution, nomenclature and uses in pharmacy
23. Six membered compounds: pyridine, reactivity, tautomerism
24. Six membered pyrimidine
25. Five membered heterocycles: pyrrole, furan, thiophene, imidazole

Section 2: Pharmaceutical spectroscopy (25 Lectures) (AS)
26. Introduction to analysis: objectives, terminology, guidance
27. Setting specifications for drug substances and products: ICHQ6A
28. Impurities: ICHQ3A; Residual Solvents: ICHQ3C
29-34. UV-Vis Spectroscopy and Fluorescence: theory and application in pharmaceutical analysis
35-38. Infrared Spectroscopy (IR): theory and application in pharmaceutical analysis
39-44. Nuclear Magnetic Resonance Spectroscopy (NMR): theory and application in pharmaceutical analysis
45-50. Mass Spectrometry (MS): theory and application in pharmaceutical analysis

PRACTICAL CLASSES (JG, AS)
Part 1 Pharmaceutical organic chemistry (3 hours each)
1. Phenytoin preparation and characterization
2. Heterocyclic chemistry: Pyrimidine synthesis
3. Pharmaceutical process chemistry I: Nitration of aromatic substrates
4. Pharmaceutical process chemistry II: Alkylation of aromatic substrates
5. Pharmaceutical process chemistry III: Oxidation and reduction chemistry

Part 2 Pharmaceutical analysis (3 hours each)
6. Fluorescence/HPLC
7. UV spectroscopy
8. pH measurements / Diazotitration
9. FTIR, NIR & NMR - CAL
10. Polarimetry/chirality & Carbohydrates

TUTORIALS (AS)
Tutorials (6 tutorials, 2 h each) arranged to complement the lecture theory and practical programme.
DIRECTED READING


Mechanism in Organic Chemistry. Sykes.

European Pharmacopoeia.

ICH Q6A, Q3A, Q3C http://www.ich.org


ASSESSMENT

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<td>MT lab reports 10%</td>
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<td>HT MCQ test 5%</td>
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<td>HT Spectroscopy assignment 5%</td>
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SUMMARY OF HOURS

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N.B.: Students are expected to satisfy the examiners in both written examinations and all practical components. Each written examination must be passed individually. The qualifying mark for examinations in this module is 40%. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit supplemental examinations.

Students who fail to satisfy any of the written requirements (less than 40%) of the written examinations, will be required to sit the supplemental examination in the failed written component only.

Students who fail to satisfy the written requirement (i.e. less than 40%) of the annual examination, but who obtain 50% or above overall for the module, will be returned as a ‘qualified fail’ (QF) and will be required take a supplemental examination in the failed written component.

Students who fail to satisfy the practical requirement (i.e. less than 40% of the practical component), but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to resubmit in the practical component.

Compensation

This module is compensatable.

The mark achieved in module PH2101 will contribute by 10% to the mark in module PH3102.
PHYSICAL PHARMACY, FORMULATION AND PHARMACEUTICAL TECHNOLOGY

Year 2 (Senior Freshman)  
Course Code: PH2104

Staff of the School of Pharmacy & Pharmaceutical Sciences: Prof. A.M. Healy (AMH), Asst. Prof. J. Quigley (JQ), Assoc. Prof. L. Tajber (LT), Dr. Zelalem Worku (ZW)

Coordinator: Assoc. Professor L. Tajber

AIMS: To explain more fully physicochemical aspects of substances used in pharmacy and medicine and to provide a continuation course in the formulation of some common pharmaceutical dosage forms, together with aspects of unit operations related to the production of effective medicines.

LEARNING OUTCOMES: On successful completion of this module the student will be able to:

1. Discuss the steps involved in pharmaceutical preformulation studies
2. Explain the importance of pH – rate profiles and describe the principal mechanistic pathways of drug degradation in respect of the stability of pharmaceutical systems
3. Explain the role of physicochemical properties in relation to drug distribution and activity
4. Summarise the fundamental theory of electrochemical systems
5. Discuss the rheological aspects of pharmaceutical systems and products
6. Describe practical and theoretical aspects of emulsion preparations as well as physical stability problems associated with production of stable pharmaceutical emulsions
7. Describe the manufacture of stable pharmaceutical ointments, creams, oral emulsions and external solutions
8. Explain the mass and heat transfer processes of pharmaceutical importance
9. Discuss the various unit processes used in the manufacture of pharmaceutical materials and formulations and describe the design and operation of various types of equipment used in these processes
10. Outline the importance of particle size, particle size analysis and powder flowability of pharmaceuticals and discuss different techniques to characterise powder size and flow
11. Describe the formulation, production and characterisation of compressed and modified release tablets
12. Demonstrate competence in related practical laboratory skills and in relevant pharmaceutical calculations

INTEGRATION

Integration Level: 9 (Multidisciplinary)

Present in the following Integration Schematics:
Theme 1: Example 1
Theme 1: Example 2
Theme 1: Example 3
Theme 2: Example 1
Theme 3: Example 1

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH2101 – Methods related to quantification of drug content in formulations, ICH and pharmacopoeial testing of drug substances
PH2106 - Integration of dispensing and extemporaneous compounding skills – especially related to the area of topical formulations and tablets
PH2108 – Genetic engineering of active substances
PH2110 – Pharmacology of drug substances used in PH2104

Vertically across years
PH1104 and PH3104 - Development of competence in practical laboratory skills; progressive complexity of skills acquired
PH1102 and PH1105 - Required for understanding issues related to pharmaceutical calculations, formulation and compounding
PH5104 - Technologies used in drug delivery design; properties of drug substances
SYLLABUS
Material will be covered on the following topics: physicochemical features of pharmaceutical systems; degradation; electrochemistry; solid state properties; solubility; rheology; viscosity; formulation of emulsions; pharmaceutical unit processes; micromeritics; tablets.

COURSE OUTLINE
Lectures, tutorials and practical laboratory classes.

LECTURES
Unit PH2104A: EMULSIONS AND TOPICAL FORMULATIONS (LT)
1. Introduction to the module
2. Terminology and classification of emulsions, emulsion-based drug delivery systems
3. Primary and secondary emulgents, HLB classification, emulsion formulation by HLB method
4. Factors affecting emulsion stability, Pickering emulsions, preparation of emulsions
5. Creams and other topical formulations

Unit PH2104B: PHYSICOCHEMICAL FEATURES OF PHARMACEUTICAL SYSTEMS
1-2. Preformulation and physicochemical testing of drugs
3-4. Accelerated stability analysis. Specific/general Acid catalysis
5-6. pH – rate profiles
7-8. Drug degradation – i. Oxidation
9-10. Drug degradation – ii. Hydrolysis
11-13. Physicochemical properties of drugs in solution
14. Electrochemical definitions; redox potentials; glass electrode
15-16. Enhancing solubility – complexation and other methods
17. Introduction to rheology
18. Types of viscosity; Non-Newtonian systems
19. Measurement of viscosity
20. Viscoelasticity

Unit PH2104C: PHARMACEUTICAL UNIT PROCESSES (AMH)
1. Introduction to mass transfer processes, mass transfer in still/stagnant gases, mass transfer in moving fluids, examples of mass transfer operations
2. Heat transfer by conduction and convection, heat transfer through walls and across pipes and tubes, heat exchange between fluids across a solid boundary.
3. Crystallisation
4. Filtration
5-6. Drying
7-8. Comminution
9-10. Mixing

Unit PH2104D: MICROMERITICS (AMH)
1. Microscopy as a technique for particle size analysis
2. Sieving as a technique for particle size analysis
3. Particle size analysis using laser light scattering techniques - laser diffraction particle size analysis and photon correlation spectroscopy
4. Other methods of particle size analysis (sedimentation, electrical sensing zone (Coulter counter) and optical sensing zone methods), Surface area measurement techniques - gas adsorption and permeametry
5. Methods of presentation and interpretation of particle size analysis results
6. Particulate solids in bulk - fundamental and derived properties, factors affecting the flow properties of powders
7. Assessment of powder flow, use of glidants, flow of solids in hoppers

Unit PH2104E: TABLETTING (LT)
1. Introduction to tableting terminology, types of tablets, release from tablets
2-3. Formulation of compressed tablets
4. Formulation of modified release tablets
5. Tablet presses, tooling and mechanism of tablet compression, direct compression
6. Dry and moist granulation procedures
7. Coating of tablets and processing problems
8. Tablet evaluation
9. GMP and continuous pharmaceutical processing

PRACTICAL CLASSES / CONTINUOUS ASSESSMENT (LT, AMH, JQ)

Calculation test (1 hour) LT
Tutorials (3 x 1 hour) LT

Michaelmas term (3 hours each) (LT)
1. Ointments
2. Emulsifying waxes, ointments and creams
3. HLB calculations and greasy creams
4. Creams continued
5. Oral emulsions
6. Dilutions and other examples of topical preparations
7. Revision and repeat
8. Practical examination

Hilary term (2 hours each), rotation (LT / JQ)
1. Colour & Clarity of Solutions / Refractive Index / Optical Rotation
2. Potentiometric titrimetry. Potentiometric determination of the pKa of benzoic acid
3. Spectrophotometric determination of the ionisation constant (pKa). Determined for both bromophenol blue and procaine
4. The standardisation of molecular size by viscosity measurements
5. Powder mixing
6. Powder characterisation
7. Tablet production using a direct compression base
8. Tablet evaluation – pharmacopoeial tests

ASSESSMENT  

<table>
<thead>
<tr>
<th>Contribution to module grade</th>
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<tbody>
<tr>
<td>1. Calculation test (Michaelmas term)</td>
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<tr>
<td>2. Continuous assessment of Hilary term practical classes</td>
</tr>
<tr>
<td>3. Practical and theory examination (Assessment I): 3 hours. This assessment will be carried out in Michaelmas term and covers unit PH2104A. This examination consists of 2 sections: A) Practical section (90% of total marks for examination). B) Theory section (10% of total marks for examination) containing 4 short questions (no choice). The qualified fail mark for this component is 50%. The pass mark for this component is 50%.</td>
</tr>
<tr>
<td>4. Term test (Assessment II): 2 hours. This assessment will be carried out in Michaelmas term and covers unit PH2104B. This examination consists of 14 short (5% of total examination marks each), 1 medium length (10% of total examination marks) and 1 long (20% of total examination marks) questions (no choice). The qualifying mark for this component is 40%. The pass mark for this component is 50%.</td>
</tr>
<tr>
<td>5. Annual examination (Assessment III): 2 hours. This examination will be carried out in Trinity term and covers units PH2104C, PH2104D and PH2104E. This examination consists of 12 short (5% of total examination marks each), and 2 long (20% of total examination marks each) questions (no choice). The qualifying mark for this component is 40%. The pass mark for this component is 50%.</td>
</tr>
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</table>
Students are expected to satisfy the examiners in written examinations, practical examination and continuous assessment components. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit the supplemental examination.

Students who fail to satisfy the practical requirement of the examination, will be required to take a supplemental examination in the practical component.

Students who fail to satisfy the written requirements of the examination, will be required to take a supplemental examination in the written components.

Students who fail to satisfy the practical examination (Assessment I) requirement (i.e., less than 50%), but who obtain 50% or better overall in the module will be returned as a qualified fail (QF) and will be required to supplement Examination I only. A penalty will be applied to marks obtained in supplemental sitting(s) (deduction of up to 50% of the maximum mark available for the component), with the effect that marks for the supplemental assessment(s) will not normally exceed the pass mark.

Students who fail to satisfy Assessment II (i.e. less than 40%), but who obtain 50% or better overall in the module will be returned as a qualified fail (QF) and will be required to take a supplemental examination in this examination only.

Students who fail to satisfy Assessment III (i.e. less than 40%), but who obtain 50% or better overall in the module will be returned as a qualified fail (QF) and will be required to take a supplemental examination in this examination only.

**Compensation**
The module is not compensatable.
This module aims to develop students’ appreciation of the medication related and non-medication related influences on health and illness, including: nutritional support and its delivery; appliances and dressings; dental care. Students will continue to develop competence to support pharmaceutical care by expanding their knowledge of pharmacy legislation and developing their clinical skills, with emphasis on considering laboratory results and responding to symptoms and prescribed therapy. In addition, students will gain work experience within a pharmacy practice environment.

Learning outcomes
On successful completion of this module, students should be able to:

1. Discuss the components of adequate nutrition, the provision of energy by the body in response to trauma/illness, the role of nutritional support in patients, the characteristics of oral, enteral and parenteral nutrition, and the implications of nutrition and feeding devices for the pharmaceutical care of patients who have undergone surgery or have ongoing illness.
2. Discuss the types and uses of ostomy appliances, vascular support hosiery and related materials, common oral and dental conditions and their treatment, the wound healing process and the actions and uses of different dressing types.
3. Critically discuss the provisions of the Medicinal Products (Prescription and Control of Supply) Regulations, other medicinal products legislation including the controls on unlicensed medicines, the Pharmacy Act 2007, and legislative controls stemming from this Act.
4. Systematically collect, interpret and apply knowledge about patients, their conditions and their medicines, in order to provide and justify treatment recommendations and patient counselling, in a diverse range of patient case studies [more complex cases than in PH11P6], including development of a care plan to identify, prevent and manage drug-related problems.
5. Dispense mock prescriptions in accordance with legal, clinical, administrative, ethical and professional requirements [more complex prescriptions than in PH11P6].
6. Critically evaluate existing literature and demonstrate the principles of academic writing by presenting a structured dissertation on an assigned topic.
7. Discuss the education, professional registration, Continuing Professional Development, and fitness to practise requirements for pharmacists in Ireland.
8. Critically reflect upon the domains, competencies and behaviours in the Pharmaceutical Society of Ireland’s Core Competency Framework for Pharmacists that are associated with individual pharmacy activities, and their implications for patient care.
9. Demonstrate sustained commitment to professional development by continuing to maintain a reflective e-portfolio comprising cyclical profiles of competence and learning needs, personal development plans, development activities and evidence of the competence/knowledge gained.
10. Apply clinical and legal knowledge in a professional and patient-focused manner under supervision in a pharmacy practice setting.

INTEGRATION
Integration Level: 11 (transdisciplinary)
Present in the following Integration Schematics (inter alia):
Theme 1: Example 1, 2, 3, 4
Theme 2: Example 1
Theme 3: Example 1
Theme 4: Example 1
Theme 5: Example 1
Other aspects which may be considered for integrative learning:
Horizontally within the year, for example with PH2104 (extemporaneous compounding and dispensing) and PH2110/PH2111 (shared pharmacology themes).
Vertically across years, for example linking with all other modules in the PHx106 sequence where topics are iteratively addressed with progressive complexity (e.g. in dispensing cases).

SYLLABUS
Material will be covered on the following topics: pharmacy legislation, nutrition and nutritional supplements, patient factors in drug treatment, clinical laboratory tests, adverse drug reactions, stoma care and ostomy products, vascular support hosiery, surgical hosiery, dental health, wound types, healing, wound dressings, bandages, clinical skills, dispensing and patient care, continuing education and continuing professional development.

COURSE OUTLINE
Lectures, tutorials, workshops, practical classes, online activities, workplace-based learning.

Note: Due to timetabling constraints, the sequence of classes may differ from that below.

LECTURES (49 hours)

<table>
<thead>
<tr>
<th>Lec No</th>
<th>Title</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction. Clinical skills and dissertation</td>
<td>MH</td>
</tr>
<tr>
<td>2</td>
<td>Feedback. Competencies, reflective practice and continuing professional development</td>
<td>SR</td>
</tr>
<tr>
<td>3-7</td>
<td>Medicinal Products (Prescription and Control of Supply) Regulations</td>
<td>SR</td>
</tr>
<tr>
<td>8-13</td>
<td>IMB/HPRA legislation, Medicinal Products legislation and exempt medicinal products</td>
<td>SR</td>
</tr>
<tr>
<td>14-19</td>
<td>Pharmacy Act, PSI Rules/guidance, EU legislation</td>
<td>SR</td>
</tr>
<tr>
<td>20-21</td>
<td>Nutrition and dietetics in health and disease</td>
<td>MH</td>
</tr>
<tr>
<td>22</td>
<td>Oral supplements</td>
<td>MH</td>
</tr>
<tr>
<td>23-25</td>
<td>Enteral and parenteral feeding and nutrition</td>
<td>TG</td>
</tr>
<tr>
<td>26-29</td>
<td>Vitamins</td>
<td>TG</td>
</tr>
<tr>
<td>30</td>
<td>Lipids as dietary supplements</td>
<td>IH</td>
</tr>
<tr>
<td>31</td>
<td>Poisonous food constituents</td>
<td>IH</td>
</tr>
<tr>
<td>32</td>
<td>Chemoprevention</td>
<td>FB</td>
</tr>
<tr>
<td>33-35</td>
<td>Ostomy</td>
<td>KR</td>
</tr>
<tr>
<td>36-37</td>
<td>Vascular support hosiery and surgical hosiery</td>
<td>KR</td>
</tr>
<tr>
<td>38-39</td>
<td>Dental health</td>
<td>KR</td>
</tr>
<tr>
<td>40-43</td>
<td>Wound types, healing, wound dressings; bandages</td>
<td>KR</td>
</tr>
<tr>
<td>44</td>
<td>Patient factors in drug treatment</td>
<td>MH</td>
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<tr>
<td>45-47</td>
<td>Clinical laboratory tests: Urea and electrolytes (U&amp;E), renal function, full blood count (FBC)</td>
<td>TG</td>
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<td>48</td>
<td>Adverse drug reactions (ADRs)</td>
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<td>49</td>
<td>Regulation of pharmacy and pharmacists in Ireland</td>
<td>PSI</td>
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PRACTICAL CLASSES / WORKSHOPS (48 hours)

<table>
<thead>
<tr>
<th>Practical No</th>
<th>Title</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Nutrition: Administration and consideration of medication use (2h)</td>
<td>TG</td>
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<tr>
<td>1.2</td>
<td>Nutrition: Disorders of absorption and special foods (2h)</td>
<td>MH</td>
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<tr>
<td>1.3</td>
<td>Ostomy and vascular support hosiery (2h)</td>
<td>KR</td>
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<tr>
<td>1.4</td>
<td>Surgical dressings (2h)</td>
<td>KR</td>
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<tr>
<td>1.5</td>
<td>Practical 2.1: Clinical skills - Communicable diseases and their treatment (3h)</td>
<td>MO’D/MH</td>
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<tr>
<td>1.6</td>
<td>Practical 2.2: Clinical skills - Cardiovascular and metabolic diseases and their treatment (3h)</td>
<td>MH</td>
</tr>
<tr>
<td>1.7</td>
<td>Practical 2.3: Clinical skills - Responding to symptoms (3h)</td>
<td>MH</td>
</tr>
<tr>
<td>1.8</td>
<td>Practical 2.4: Clinical skills - Drug interactions and other drug-related problems (3h)</td>
<td>TG</td>
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</table>

<table>
<thead>
<tr>
<th>Patient facing workshop: Engagement with cardiovascular patients (2h)</th>
<th>TR/ANO/IHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical 2.5: Dispensing and Patient Care - Prescription and control of supply regulations (2h)</td>
<td>SR/BTP/CRTG/MO’D</td>
</tr>
<tr>
<td>Practical 2.6: Dispensing and Patient Care - Emergency supply (2h)</td>
<td>SR/BTP/CRTG/MO’D</td>
</tr>
<tr>
<td>Practical 2.7: Dispensing and Patient Care - Primary-secondary care interface (2h)</td>
<td>SR/BTP/CRTG/MO’D</td>
</tr>
<tr>
<td>Practical 2.8: Dispensing and Patient Care - Unlicensed and extemporaneous medicines (2h)</td>
<td>SR/BTP/CRTG/MO’D</td>
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<tr>
<td>Practical 2.9: Dispensing and Patient Care - Hospital dispensing (2h)</td>
<td>SR/BTP/CRTG/MO’D</td>
</tr>
<tr>
<td>Practical 2.10: Dispensing and Patient Care - Review (2h)</td>
<td>SR/BTP/CRTG/MO’D</td>
</tr>
<tr>
<td>Healthcare professions and interdisciplinary teams (2h)</td>
<td>MO’D</td>
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</tbody>
</table>
Discussion of experiential learning and CCF Live (debrieing and learning consolidation) (2h)

Objective structured clinical examination (OSCE): Required knowledge/skills and their evaluation (1h)

Preparation for OSCE 1 (2h) SR/MH/BTP/CR/TG/MO'D/TR/ANO
Assessment by OSCE 1 (2h) SR/MH/BTP/CR/TG/MO'D/TR/ANO
Preparation for OSCE 2 (2h) SR/MH/BTP/CR/TG/MO'D/TR/ANO
Assessment by OSCE 2 (2h) SR/MH/BTP/CR/TG/MO'D/TR/ANO
Pharmacy practice practical test (1h timetabled; test duration: 50 mins) SR/BTP/CR/TG/MO'D/TR/ANO

TUTORIALS (6 hours)
Dispensing and patient care (6 x 1h) SR/BTP/CR/TG/MO'D

DISSERTATION (25 hours)
Literature review and critical analysis of topic associated with the SF course (3,000 word essay) MH/guided study

WORKPLACE-BASED LEARNING (84 hours)
Principal Professional Placement in patient facing or non-patient facing setting (70h) ANO
Patient-facing experience; Core Competency Framework Live [CCF Live] activities TR/ANO
(14h, as two days full-time)

Assessment
Pass mark = 50% unless specified otherwise. Each component must be passed independently.

Component

Written examination: 2 hours. Section A: 2 long questions (no choice; may have multiple subsections). Section B: 50 MCQs (no choice; negative marking, +1/-0.25). Students must obtain at least 40% in Section A and at least 40% in Section B, as well as at least 50% for the paper overall (both sections combined).

Dispensing and patient care coursework (minimum 60% for each practical worksheet) 5%
Pharmacy practice practical test; minimum 60% and no level 1 errors. 5%
Level 1 error: Automatic failure of the entire test, irrespective of the marks awarded.
Level 2 error: Zero marks for the question in which the error is made.
Level 3 error: Deduction of 41% of the maximum marks available for the question in which the error is made.
Level 4 error: Deduction of 20% of the maximum marks available for the question in which the error is made.
Level 5 error: Deduction of 10% of the maximum marks available for the question in which the error is made.
Level 6 error: Deduction of 5% of the maximum marks available for the question in which the error is made.

Dissertation 10%
Continuous assessment in clinical skills and nutrition 5%
Objective structured clinical examination (OSCE) assessments and associated exercises 5%
Principal Professional Placement activities, CCF Live 2 and reflective continuing professional development e-portfolio (satisfactory/unsatisfactory) ---

NB: Students will be expected to draw upon knowledge and skills gained in this module both in other clinically focused modules in the current year and wherever relevant in all subsequent years of the programme (e.g. in the clinical pharmacy assessments linked to pharmacology and therapeutics components, Practice of Pharmacy theory papers, clinical skills exercises, dispensing and patient care evaluations, practical tests, competence assessments and performance appraisals [CAPAs], OSCEs and the professional registration examination).

Bibliography
Legislation relevant to the course.
Supplementary references as recommended by academic staff.
SUMMARY OF HOURS (excludes workplace-based learning)

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Practicals/Workshops</th>
<th>Tutorials</th>
<th>Contact hours</th>
<th>Practical reports</th>
<th>Guided study</th>
<th>TOTAL</th>
<th>ECTS</th>
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<td>8</td>
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<td>240</td>
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</table>

**Pass mark, plagiarism**
The pass mark for examinations and assessments is 50% except where otherwise indicated. See ‘Assessment’ above. Students should note that College penalties for plagiarism apply to both examinations and continuous assessment.

**Late work**
Continuous assessment exercises for this module must be presented for evaluation by the specified date(s). They must be presented to a designated member of staff in the manner requested (e.g., in person/by email/through the virtual learning environment), and signed in on the form for this purpose where applicable. Work submitted late will not be assessed unless a valid reason is provided, and permission for late submission should be obtained in advance of the submission deadline from the staff member responsible for the continuous assessment component. Where late work with a valid excuse is accepted for assessment, a penalty may be applied (deduction of up to 50% of the maximum marks available for the component) with the effect that marks for the late work will not normally exceed the pass mark.

**Missed classes/assessments**
In common with other modules for the pharmacy degree, attendance at all scheduled classes for this module is compulsory. A student who is unable to attend a class for any reason must notify his/her tutor of the reason for absence without delay, and present certification as appropriate. However, all continuous assessment components must be completed even if the student is absent for a valid reason. It is the student’s responsibility to obtain details of the assessment for the missed class(es) from the relevant staff member without delay, and to complete it on a self-study basis. The deadline for submission of the completed assessment to the relevant staff member is five days from the student’s return to College (return date notified to staff member by tutor, based on certification as appropriate) unless otherwise agreed in advance with the relevant staff member. Where feedback on the assessment has already been provided to the class prior to submission, a penalty may be applied (deduction of up to 50% of the maximum marks available for the assessment), with the effect that marks for the assessment will not normally exceed the pass mark. See above for late submissions.

**Progression and supplementals**
Students must satisfy the examiners in each component of the module independently. A student may be returned as a ‘qualified fail’ (QF) and refused permission to progress with his/her class until he/she has satisfied the examiners in all components of the module. This may necessitate sitting a supplemental examination and/or repetition/(re)submission of one or more continuous assessment components (including submission of one or more alternative exercises that have been set to replace failed/missed continuous assessment components). In such circumstances, while the marks attained in a supplemental theory examination will not be capped, penalties may be applied to continuous assessment components including supplemental practical tests (deduction of up to 50% of the maximum marks available for the relevant element(s)), with the effect that marks for such elements will not normally exceed the pass mark.

**Non-satisfactory reports**
Students who have not fulfilled the module requirements with regard to attendance and/or coursework may be reported to the Senior Lecturer as non-satisfactory for one or more terms. Students reported as non-satisfactory for the Michaelmas and Hilary terms may be refused permission to take their annual examinations and may be required by the Senior Lecturer to repeat the year.

**Professional dress code**
Students are required to dress appropriately and behave in a professional manner for elements of the course entailing attendance at external facilities (professional experience in pharmacies, case review in hospitals, health service facilities etc.).

**Compensation**
This module is not compensatable.
AIMS: Students will be provided with an overview of the biochemical aspects of metabolism, study production of therapeutic proteins and carbohydrates and their components, and will be provided with an introduction to Pharmaceutical Biotechnology including gene structure and expression, genetic engineering, upstream and downstream processing.

PRE-REQUISITES: Successful completion of Junior Freshman (Year 1)

LEARNING OUTCOMES: On successful completion of the module the student will be able to:
1. Explain the term ‘pharmaceutical biotechnology’.
2. Discuss the basic principles of gene transcription and translation.
3. Describe the process of genetic engineering.
4. Describe techniques routinely used for genetically engineered recombinant proteins, their production and purification.
5. Discuss the source, preparation, analysis and use of representative examples of therapeutically important peptides and carbohydrates.
6. Describe how proteins are glycosylated and how glycosylation affects proteins.
7. Discuss folate, Vit. B12, and alcohol metabolism and intermediary metabolism of lipids and amino acids.

INTEGRATION
Integration Level: 6 (Sharing)
Present in the following Integration Schematics:
Theme 1: Example 4

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH2101 – Understanding of organic chemistry and stereochemistry is built on with regards to DNA, peptides and carbohydrates; analysis of peptides and carbohydrates
PH2104 – Physical properties and formulation issues addressed
PH2110 - Antibiotics links in with carbohydrates (aminoglycosides)

Vertically across years
BIPH01 - Introductory Biochemistry module which is built upon
PH3102 – Mechanism of action of antibiotics is further detailed
PH3104 - Biosimilars links with design and optimization of protein structure
PH4105 – Drug metabolism theme is further developed
MPH5104 - Molecular cloning and engineering of DNA taught in PH2108 links with advanced drug delivery

SYLLABUS
Material will be covered on the following topics: gene structure and expression; genetic engineering, upstream and downstream processing; pharmaceutical peptides and carbohydrates; glycoproteins; intermediary and alcohol, folate and Vit. B12 metabolism.

COURSE OUTLINE
Lectures, tutorials, and practical laboratory classes.
LECTURES
(Sequence of lectures may be different due to timetabling constraints)

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gene structure and expression – DNA structure</td>
</tr>
<tr>
<td>2</td>
<td>Gene structure and expression – DNA Replication</td>
</tr>
<tr>
<td>3-4</td>
<td>Gene structure and expression – Transcription</td>
</tr>
<tr>
<td>5</td>
<td>Gene structure and expression – Translation</td>
</tr>
<tr>
<td>6</td>
<td>Introduction to Pharmaceutical Biotechnology</td>
</tr>
<tr>
<td>7</td>
<td>Genetic Engineering; the recombinant process</td>
</tr>
<tr>
<td>8-10</td>
<td>Upstream processing</td>
</tr>
<tr>
<td>11-15</td>
<td>Downstream processing</td>
</tr>
<tr>
<td>16</td>
<td>Pharmaceutical peptides: primary structure and physicochemical properties</td>
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<tr>
<td>17</td>
<td>Production of pharmaceutical peptides: solid phase synthesis</td>
</tr>
<tr>
<td>18</td>
<td>Chemical and physical stability of pharmaceutical peptides, sequencing</td>
</tr>
<tr>
<td>19</td>
<td>Peptide drugs, design and pharmaceutical properties</td>
</tr>
<tr>
<td>20</td>
<td>Pharmaceutical proteins; tertiary structure and physico-chemical properties</td>
</tr>
<tr>
<td>21</td>
<td>Glycoproteins – biosynthesis and physiological function</td>
</tr>
<tr>
<td>22</td>
<td>Blood groups, blood transfusion</td>
</tr>
<tr>
<td>23</td>
<td>Polysaccharides, biotechnological production of aminoglycosides</td>
</tr>
<tr>
<td>24-27</td>
<td>Intermediary metabolism (lipids)</td>
</tr>
<tr>
<td>28-31</td>
<td>Intermediary metabolism (amino acids)</td>
</tr>
<tr>
<td>32-33</td>
<td>Cholesterol, bile salts and lipoproteins</td>
</tr>
<tr>
<td>34-35</td>
<td>Alcohol metabolism</td>
</tr>
<tr>
<td>36-40</td>
<td>Nutrition – anaemias, iron, folate &amp; B12</td>
</tr>
</tbody>
</table>

PRACTICAL CLASSES (4 hours each, unless indicated)

1. Introduction to safety in the lab, Good Laboratory Practice (2 hrs)
2. Spectrophotometry
3. Subcellular Fractionation
4. Kinetics of Inhibition
5. PCR (Part 1)
6. PCR (Part 2)
7. Oxidative Phosphorylation

Practical Tutorials (2x 2 hrs, 1x 1 hr)

DIRECTED READING

ASSESSMENT
Pass mark = 50%

Written exam - 3 hours (4 essay questions (70%), 40 MCQ (30%)
  negative marking applies for MCQs (+1/-0.25)
  85% of total marks
Practicals
  15% of total marks
Assignment 1: practicals 1-3, due on 11th Nov 2016, Blackboard.
Assignment 2: special assignment, due 20th Jan 2017, Blackboard.
Marks Breakdown: 3% for in-lab assessment, 6% for Assignment 1 and 6% for Assignment 2.

SUMMARY OF HOURS

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Practicals</th>
<th>Tutorials</th>
<th>Contact hours</th>
<th>Practical reports</th>
<th>Guided study</th>
<th>TOTAL</th>
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</tbody>
</table>

N.B.: Students are expected to satisfy the examiners in both written examination and practical components. The pass mark for the module is 50%. Students who obtain an overall mark of less than 50% will be required to sit the supplemental examination.

Students who fail the written examination with less than 40% of the annual examination, will be required to take a supplemental examination.

Students who fail the written examination with less than 40% of the annual examination, but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required take a supplemental examination.

Students who fail the practical requirement with less than 40%, will be required to resubmit.

Students who fail the practical requirement with less than 40%, but who obtain 50% or above overall for the module, will be returned as a qualified fail (QF) and will be required to resubmit in the practical component.

Compensation
This module is compensatable.
MOLECULAR AND CHEMOTHERAPEUTIC PHARMACOLOGY & CLINICAL THERAPEUTICS
Year 2 (Senior Freshman)  MODULE CODE: PH2110

Staff of the School of Pharmacy and Pharmaceutical Sciences: Asst. Prof. M.J. Santos-Martinez (MS); Asst. Prof. N. Frankish (NF); Asst. Prof. C. Medina (CM); Assoc. Prof. T. Grimes (TG); Assoc. Prof. Helen Sheridan (HS); Assoc. Prof. C. Roche (CR), Asst. Prof. S. Smith (SMS).

Staff of School of Biochemistry and Immunology – Dept of Microbiology: Asst. Prof. J. Geoghegan (JG), Asst. Prof. K. Roberts (KR), Prof. T. Rodgers (TR).

Dept of Clinical Microbiology: Assoc. Prof. S. Smith (STS).

Coordinator: Assoc. Professor Neil Frankish

AIMS: To allow the student to understand how chemical mediators modulate the body’s response to injury and infection; to enable the student to appreciate how microbiology impinges on many aspects of Pharmacy; to acquire a knowledge of the mode of action of antibiotics, anti-parasitic drugs and anti-viral agents; to apply this knowledge to therapeutic case studies and problems.

PRE-REQUISITES: Completion of year 1.

Learning outcomes
On successful completion of this module, students should be able to:
1. Recall the various chemical mediators of inflammation and their physiology and pathology
2. Identify the mechanism of action of the different classes of anti-inflammatory drugs, their clinical use, cautions and side effects.
3. Describe microbial structure, culture and identification
4. Describe medically significant bacteria and fungi and protozoa and their pathogenic mechanisms
5. Explain the mechanisms of action of the major antimicrobial drugs
6. Discuss infectious-disease epidemiology and zoonoses
7. Discuss the determinants of the immune response, autoimmunity, immunocompetence & immunotherapy
8. Describe viral structure, multiplication and viral diseases
9. Explain the main types of human ectoparasite infestation.
10. Advise on and critically assess the products used to treat and protect against ectoparasite infection.
11. Analyse and critically assess the procedures for the control of infestation in residential care and acute hospital settings.
12. Explain the importance of ectoparasite control in the context of disease transmission.
13. Identify the mechanism of action of the different groups of antibiotics as a basis for their selective toxicity.
14. Recall the clinical use of antibiotics, their side effects and cautions to use.
15. Recall the nature of antibiotic use and the means to reduce antimicrobial resistance.
16. Identify the mechanism of action of antifungal drugs, their clinical use and side effects
17. Identify the mechanism of action of the different classes of antiviral drugs, their clinical use and side effects
18. Apply knowledge to individual patient therapeutic case studies and problems

INTEGRATION
Integration Level: 6 (Sharing)
Present in the following Integration Schematics:
Theme 2: Example 1
Theme 3: Example 1
Theme 4: Example 1

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH2010 – Complements knowledge of drugs’ structure and appreciation of the regulatory environment and quality issues
PH2104 – Is complemented by formulation of drugs in the module
PH2106 - Gives necessary background to clinical practice
PH2108 – Links with role of biotechnology in drug design

Vertically across years
PG1101 – learning outcomes from physiology are required to appreciate PH2110
PH1109 – Further develops General Principles of Pharmacology to specific areas
PH3102 – Further in-depth learning regarding mechanism of action
COURSE OUTLINE:
Chemical mediators and disease; chemotherapy of infestations and infectious disease.

SYLLABUS
Material will be covered on the following topics: Pharmacology, clinical pharmacology and clinical case studies on chemical mediators and disease; chemotherapy of infestations and infectious disease.

COURSES OUTLINE:
Lectures, seminars, online case studies followed by face-to-face feedback sessions and practical laboratory classes.

<table>
<thead>
<tr>
<th>LECTURES</th>
<th>Lecturer</th>
</tr>
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<tbody>
<tr>
<td>Inflammation and inflammatory mediators</td>
<td>CM</td>
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<tr>
<td>Inflammation and inflammatory mediators</td>
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<td>SMS</td>
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<td>Aspirin &amp; Non-selective COX inhibitors</td>
<td>CM</td>
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<td>DMARDS</td>
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<td>Introduction to ectoparasites</td>
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<td>Human ectoparasites: Head lice, body lice and pubic lice (2)</td>
<td>HS</td>
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<tr>
<td>Human ectoparasites: Treatment and control of human ectoparasites.</td>
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<td>Scabies: Treatment and control</td>
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<tr>
<td>Veterinary aspects of ectoparasite control</td>
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<td>Ectoparasites and Transmission of disease</td>
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<td>Insect repellents</td>
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<td>Antimicrobials: sites of action of main antibiotics</td>
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<td>Antimetabolites</td>
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<td>Cell wall Inhibitors</td>
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<td>Cell wall Inhibitors</td>
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<td>Drugs acting at the cell membrane</td>
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<td>Inhibitors of DNA/Protein synthesis</td>
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<td>Inhibitors of DNA/Protein synthesis</td>
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<td>Endotoxin shock</td>
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<td>Tuberculosis and antitubercular drugs</td>
<td>NF</td>
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<td>Tuberculosis and antitubercular drugs</td>
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<tr>
<td>Fungal Diseases and antifungal agents</td>
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<td>Fungal Diseases and antifungal agents</td>
<td>NF</td>
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<td>Protozoal &amp; Parasitic diseases in man and their treatment</td>
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<td>Protozoal &amp; Parasitic diseases in man and their treatment</td>
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<tr>
<td>Vaccines</td>
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<td>Urinary tract infections</td>
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<td>Gastrointestinal infections</td>
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<td>Respiratory infections</td>
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<td>Meningitis/septicaemia</td>
<td>STS</td>
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<tr>
<td>Fungi &amp; antifungal therapies</td>
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<td>STIs</td>
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CASE STUDIES (8 hours total)
e-learning clinical case studies and problem solving. TG

TUTORIALS (4 hours total)
Feedback on e-learning TG

PRACTICAL CLASSES (5 hrs) AMENDED
1. Aseptic technique/Nutritional and atmospheric requirements
2. Differential and selective media
3. Enumeration of bacteria and their killing by a disinfectant
4. Antibiotics
5. Identification of bacteria

DIRECTED READING
• Kumar & Clark (Eds), Clinical Medicine, 8th Edition, 2012.
• Kenneth P Murphy, Janeway’s Immunobiology 8th edition, 2012

ASSESSMENT
Pass mark = 50% unless specified otherwise
Written paper (3 hours)
20 Short Answer questions (all compulsory) 55%
50 MCQ (all compulsory) 25%
Continuous assessment, essay on ectoparasites (HS) 10%
Continuous practical assessment (microbiology practicals) 10%
Assessment of the lab course will be as follows:
Attendance: 20%
Lab Book: 20%
Experimental write-up 60%
The Lab Books will be assessed for overall quality and quantity of the work submitted. One experiment will be chosen for writing up in detail, according to instructions to be given. The write-up will be marked and returned to the student with comments. Students will be advised in advance which practical is to be written up in detail.

Clinical pharmacy assessment* (contributes 5% to PH2110 and 10% to PH2111)
Continuous assessment (applied therapeutics e-learning, TG) 5%

*Clinical Pharmacy Assessment
(Coordinators Assist. Prof. M.J. Santos-Martinez & Assoc. Prof. T. Grimes)
This assessment will take place in Hilary Term. It is an "open book" examination that includes case studies based on topics covered in all Pharmacology modules (PH2110, PH2111). Students are required to demonstrate application of pharmacology and therapeutics knowledge to solve case studies and problems.
Pass mark for this component is 50%. It is a requirement to pass the Clinical Pharmacy Assessment.

SUMMARY OF HOURS

<table>
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<tr>
<th>Lectures</th>
<th>Case Studies</th>
<th>Tutorials</th>
<th>Contact hours</th>
<th>Practical Classes</th>
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<th>Guided study</th>
<th>TOTAL</th>
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Compensation
This module is compensatable.
BLOOD, CARDIOVASCULAR AND RENAL PHARMACOLOGY & CLINICAL THERAPEUTICS

Year 2 (Senior Freshman)  MODULE CODE: PH2111

Staff of the School of Pharmacy & Pharmaceutical Sciences: Assoc. Prof. N. Frankish (NF), Assoc. Prof. T. Grimes (TG), Asst. Prof M.J. Santos-Martinez (MS)

Coordinator: Assoc. Professor Neil Frankish

PRE-REQUISITES: Completion of Year 1

AIMS: The student will acquire knowledge of pharmacology and clinical therapeutics relevant to the use of drugs and medicines in cardiovascular and thrombotic conditions and oedematous states.

LEARNING OUTCOMES: On successful completion of this module the student will be able to:
1. Describe the underlying pathology and aetiology of the varying forms of cardiovascular disease.
2. Explain the various risk factors and how lifestyle behaviour can influence cardiovascular disease.
3. Classify drugs used to treat cardiovascular disease
4. Describe their mechanism of action, their adverse effects and potential drug interactions and their clinical use
5. Describe the pathophysiology of the different forms of anaemia and their treatment
6. Describe pathology and treatment of renal diseases and the use of diuretics
7. Describe the physiology of lipid metabolism, the role of lipids in atherosclerosis and how drugs modify lipid metabolism and the clinical outcomes of atherosclerosis
8. Describe mechanisms of haemostasis and thrombosis, pharmacology and therapeutics of classical and investigational antithrombotic drugs
9. Apply knowledge to individual patient case studies and therapeutic problems.

INTEGRATION
Integration Level: 7 (Correlation)
Present in the following Integration Schematics:
Theme 2: Example 1
Theme 4: Example 1

Other aspects which may be considered for integrative learning:
Horizontally within the year
PH2010 - Complements knowledge of drugs’ structure and appreciation of the regulatory environment and quality issues
PH2104 - Links with physiochemical and formulation of drugs in the module
PH2106 – Gives necessary background to clinical practice
PH2108 – Links with role of biotechnology in drug design

Vertically across years
PG1101 – Takes learning outcomes from physiology as a basis for further learning
PH3111 – Links with drug use in diseases in immunity
PH3110 – Links with Respiratory & Gastrointestinal Pharmacology and Clinical Therapeutics
PH3106 – Provides a basis for Practice of Pharmacy

SYLLABUS
Material will be covered on the following topics: pathophysiology, aetiology, and risk factors of cardiovascular disease, anaemia, artherosclerosis and renal diseases. Drug treatment of these conditions, including mechanism of action, side effects, and interactions; case studies and therapeutic problems.

COURSE OUTLINE:

CARDIOVASCULAR PHARMACOLOGY LECTURES
<table>
<thead>
<tr>
<th>Lecturer</th>
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<tbody>
<tr>
<td>1. Basic cardiovascular pharmacology</td>
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<td>2. Renin-angiotensin system</td>
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<tr>
<td>3. Circulation and cardiac function</td>
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<tr>
<td>4. Circulation and cardiac function</td>
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<tr>
<td>5. Dysrhythmias</td>
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8. Angina
9. Antihypertensive drugs
10. Antihypertensive drugs
11. Hypertension
12. Drugs used to treat congestive heart failure
13. Drugs used to treat congestive heart failure
14. Anaemia
15. Anaemia
16. Renal physiology and pathology
17. Diuretics
18. Diuretics
19. Lipids
20. Lipid-lowering drugs
21. Lipid-lowering drugs
22. Haemostasis and thrombosis
23. Anti-platelet drugs
24. Anticoagulants and fibrinolytics
25. Antithrombotics: clinical case studies

CASE STUDIES (8 hours total)
Cardiovascular pharmacology: case studies 1 TG
Cardiovascular pharmacology: case studies 2 TG

TUTORIALS (4 hours total)
Feedback on CV case study 1 TG
Feedback on CV case study 2 TG
Feedback on Renal function case study TG
Feedback on Anti-thrombotic case study TG

DIRECTED READING – will be indicated, as relevant at each lecture.

ASSESSMENT
Pass mark = 50% unless specified otherwise

Exam paper (2 hours, 20 Short Questions)(all compulsory)
Continuous assessment (Case studies)
Clinical Pharmacy Assessment*

Weighting

70% of total marks
20% of total marks
10% of total marks

*Clinical Pharmacy Assessment
(Commaries Assist. Prof. M.J. Santos-Martinez & Assoc. Prof. T. Grimes)
This assessment will take place in Hilary Term. It is an “open book” examination that includes case studies based on topics covered in all Pharmacology modules (PH2110, PH2111). Students are required to demonstrate application of pharmacology and therapeutics knowledge to solve case studies and problems.
Pass mark for this component is 50%. It is a requirement to pass the Clinical Pharmacy Assessment.

SUMMARY OF HOURS

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<th>Total Contact</th>
<th>Guided Study</th>
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<th>ECTS</th>
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Compensation
This module is compensatable.
1. INTRODUCTION

This document is intended to provide guidance on student fitness to practise procedures in the School of Pharmacy and Pharmaceutical Sciences, TCD, according to the Trinity College Dublin Fitness to Practise Policy. Pharmacy students, in common with other health professional students, have certain privileges and responsibilities different from those of other students. Because of this, different standards of professional conduct are expected of them.

The framework governing fitness to practise cases is placed on a firm footing in College by the 2010 Statutes and Schedules, College Fitness to Practise Policy, the College Calendar, School Fitness to Practise Policies, Codes of Conduct for Schools and relevant Health Service Providers and other College Policies (e.g. Disciplinary Policy, Garda Vetting Policy).

The framework governing fitness to practise cases is conceived in section 5 of the Chapter on Student Conduct and Capacity in the 2010 Statutes and the procedural detail is described in Schedule 5 to that Chapter. This is supplemented by the College Fitness to Practise Policy which

“...so far as is possible (is) to be read together (with the Statutes and Schedules) as one document...however...in cases of conflict or inconsistency between the Policy on the one hand, and the Statutes and Schedules on the other, the latter shall prevail.”

Student Conduct

Students of the School of Pharmacy and Pharmaceutical Sciences, Trinity College Dublin are expected, both while on practice experience* and in the classroom and laboratories, to demonstrate a high standard of professional behaviour. While on practice experience, students are required to comply with the Code of Conduct for Pharmacy students of the School of Pharmacy and Pharmaceutical Sciences, with the disciplinary rules of the practice experience provider where the practice experience is located and with the regulations of Trinity College Dublin relating to student conduct. When on practice experience students are reminded that patients and client’s interests and safety take precedence over students’ education.

Students who have been found unfit to practise may be prevented from progressing to the fifth (M.Pharm.) year of the Pharmacy (Integrated) programme.

*NOTE: For the purposes of this document the term “practice experience” is taken to mean any of the following, undertaken by the student as part of his/her course of studies and/or during the time in which he/she is a registered student of the University:

- Period of practice placement in a pharmacy, health service provider or other establishment, which is (primarily) arranged by the University
- Period of work experience in a pharmacy, health service provider or other establishment which is (primarily) arranged by the student
- Visit to a community pharmacy, hospital pharmacy, industry or any other establishment, whether arranged by the student or the University
2.- STATUTORY REQUIREMENTS

2.1 Requirement for Schools to formulate policy and constitute Committees

Section 2(1) of Schedule 5 of the 2010 Statutes states:

1) Each School in which fitness to practise matters can normally arise should

   a) formulate a policy relating to such matters and

   b) constitute a Fitness to Practise Committee...

School Pharmacy and Pharmaceutical Sciences Fitness to Practise Committee – Committee members

The School Committee shall consist of three members of staff designated by the Faculty Executive and one of the members shall be appointed by the Faculty Executive to act as chair. Two members will be from the School of Pharmacy and Pharmaceutical Sciences, one of whom must teach in Practice of Pharmacy. The third member should be from another School outside the Faculty with fitness to practise requirements. Where the Faculty Executive deems it appropriate, one of the School members may be substituted by a staff member of the establishment where the student was on practice experience. For the avoidance of doubt, it should be noted that members of the School Fitness to Practise Committee do not act in any representative capacity but rather are required to bring their own individual judgment to bear on the question of whether the student complies with the School’s fitness to practise requirements. A member of the School’s administrative staff may be in attendance at meetings of the School Fitness to Practise Committee for the purpose of recording decisions made by such Committee. In dealing with a concern regarding a student’s fitness to practise, the School Fitness to Practise Committee shall follow the procedures set out in Schedule 5 of the Chapter on Student Conduct and Capacity in the 2010 Statutes, entitled ‘Fitness to Practise’. Section 2(5) of that Schedule provides that the “School [Fitness to Practise] Committee shall determine its own procedures and shall perform its functions with due enquiry”.

The number of people required for a meeting of the School Fitness to Practise Committee to be quorate shall be 50% of the membership plus one.

Substitution may be permitted if a Committee becomes temporarily or permanently inquorate. If such a situation should arise in the context of a permanent substitution, the new member(s) should be given an opportunity to read the transcripts of previous hearings. Remaining Committee members shall not hear evidence twice due to the substitution of a Committee member.

2.2 Requirement for the College to constitute a Fitness to Practise Committee

Section 4 of Schedule 5 of the 2010 Statutes states:

1) There shall be a College Fitness to Practise Committee

2) The membership of the College Committee shall be determined by Council, subject to the approval of Board.

The College Fitness to Practise Policy outlines the composition of the College Fitness to Practise Committee. Section 4(4) of Schedule 5 confirms that an appeal to the College Fitness to Practise Committee is a full rehearing.

2.3 Due enquiry and natural justice

The College Fitness to Practise Policy notes the statutory requirement contained in Schedule 5 of the Chapter on Student Conduct and Capacity in the 2010 Statutes that both the College Fitness to Practise Committee and the School Fitness to Practise Committee “shall determine (their) own procedures and perform (their) functions with due enquiry”.

The Policy further notes the definition of ‘due enquiry’ in s. 17(1) of the Introduction Chapter to the 2010 Statutes as meaning “diligent, proper and impartial investigation or consideration as the case may be, subject to principles of natural and constitutional justice and fair procedures.”
3. PROCEDURES

3.1 Dealing with the complaint at first instance

Where a member of College staff or practice-based staff or other appropriate individual has a concern regarding a student’s fitness to practice, s/he should refer the student’s case, in the first instance, to the relevant Director of Teaching and Learning (Undergraduate or Postgraduate, in accordance with the student’s standing), this function having been delegated to the Directors by the Head of School. In cases where there may be actual/perceived conflict of interest (e.g. where the Director is the student’s tutor, where the Director was the original complainant or where he/she was otherwise involved in the case) the Head of School must resume this function or delegate it to another appropriate office holder within the School.

The Director must discuss the case with the Junior Dean, having first checked to see whether the School has a record of the student being registered with the Disability Service. Where there is no such record, the Director must request the student’s tutor or postgraduate advisor to meet with the student to encourage disclosure of any undisclosed disability. If the student has a disability, the Director must discuss the case with the Junior Dean and the Disability Officer (whether or not the student is registered with the Disability Service). Following this consultation, the Director/Junior Dean must decide which process (Fitness to Practise or other) to apply. In making this decision, the Director/Junior Dean must first consider whether the concern could fall under disciplinary cases, matters of student mental ill health or other health concerns or Garda vetting cases. The College Policy clearly outlines that these three categories should not in the first instance be dealt with under the fitness to practise procedures.

At this point, the DUTL/Junior Dean should also consider whether it is necessary to temporarily suspend a student (see Section 3.4 below, power to suspend).

In particular, the student should be notified beforehand in writing of the School’s concerns in relation to his/her ability to comply with fitness to practise requirements. The student is entitled to be present at the hearing when those concerns are presented to the School Fitness to Practise Committee. The student’s tutor (or, in the case of a student registered on a postgraduate course, a postgraduate student advisor) or any other person of the student’s choice may represent the student; and the student and any such representative shall be given full opportunity to be heard on the matter before the School Fitness to Practise Committee. In particular, the student or his/her representative is entitled to question the representative of the School on the case made against the student. The representative of the party referring the case to the School Fitness to Practise Committee is equally entitled to be present at the hearing when the student’s response to the concerns raised is presented and is entitled to question the student on this response.

Where the School Fitness to Practise Committee decides that the concern is well founded, it may take any of the actions set out in section 3 of Schedule 5 (see Section 4.5 below on decisions of the School Fitness to Practice Committee). The School Fitness to Practise Committee shall also notify the parties of the right of appeal to the College Fitness to Practise Committee.

3.2 Common issues that may arise which, in the first instance, are not normally handled as fitness to practise matters

Fitness to practise matters should not normally be dealt with as matters of discipline, but there will be some exceptional cases where this will be necessary, either in whole or in part. Where it is decided that a case or a part thereof should be treated as a disciplinary matter, the case shall be dealt with in accordance with College’s disciplinary procedures as set out in Schedule 2 to the Chapter on Student Conduct and Capacity in the 2010 Statutes.

The following describes a number of possible issues relating to the fitness of a student to practice. It comprises a non-exhaustive summary, and is for guidance only; the School should deal with each case individually.

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1 Disability refers to instances where the student or the Disability Service with the consent of the student has disclosed the disability to the School.
a) Plagiarism

In the General Regulations of the College Calendar, it is stated that “the University considers plagiarism to be a major offence, and subject to the disciplinary procedures of the University”. Cases of plagiarism should therefore generally be dealt with under the regulations outlined in the College Calendar and not under the Fitness to Practise Policy.

b) Poor conduct (general)

Poor conduct should be dealt with using the disciplinary procedures, rather than the Fitness to Practise Policy. The type of conduct that invokes the College Disciplinary Procedures is clearly described in Part 1 of Schedule 2 of the Chapter on Student Conduct and Capacity in the 2010 Statutes and includes, but is not limited to:

1. Activity which brings the College into disrepute
2. Misconduct in relation to examinations, libraries and the use of other College facilities, services and accommodation
3. Disruption of the normal operation of activities within the College
4. Harassment or misbehaviour on College property or in dealings with others

Part 2 also clearly covers attempts to breach College regulations, and states that any breaches or attempted breaches of the criminal law should also be dealt with under the disciplinary procedures.

If a criminal investigation is being conducted at the same time as a fitness to practise investigation, the fitness to practise investigation must be paused pending the outcome of the criminal investigation.

c) Garda vetting cases

Fitness to practise cases that arise as a result of Garda vetting of a student shall be dealt with in accordance with the Garda Vetting Policy and Procedures for Undergraduate and Postgraduate Students, 2009. This reads:

“Students on courses with clinical or other professional placements may be required to undergo Garda vetting procedures prior to commencing placements. If, as a result of the outcome of the Garda vetting procedures, a student is deemed unsuitable to attend clinical or other professional placement, he/she may be required to withdraw from his/her course.”

TCD uses the Garda Síochána (Garda Central Vetting Unit (GCVU)) which, where applicable, may liaise with the Police Service of Northern Ireland vetting service to assess the suitability of applicants (“Applicants”) for admission to such Programmes. Garda Vetting includes Police Vetting in respect of other jurisdictions. Students who have resided outside Ireland for a consecutive period of 6 months or more will be required to provide police clearance documentation from the country in which they resided at the time of registration.

d) Students with disabilities

The College policy states that ‘if a student has a disability, and there are concerns over fitness to practise, section 4 of Schedule 1 of the Chapter on Student Conduct and Capacity in the 2010 Statutes, entitled ‘Student Discipline’ shall apply, and the guidelines outlined therein should be followed prior to any fitness to practise hearing’.

Section 4 of the College Fitness to Practise Policy refers to the need to provide reasonable accommodation to students with disabilities. If a student with disabilities has been provided with reasonable accommodation which enables him/her to participate fully in his/her programme and there are still concerns about the student’s ability to practise elements of his/her course, the case shall be dealt with under section 3 of the College Fitness to Practice Policy (the normal procedures), in the same way as any other student on the course.

To ensure that the School of Pharmacy has fulfilled its requirements under section 4 of the College Policy, the School will endeavour to work with the student, the College Disability Service and the relevant practice-based staff. In particular, the School will endeavour to ensure that the practice-based staff are aware of College policies in relation to students with disabilities and the role of the Disability Service.
It is the duty of the School to ensure that they have complied with Section 4 of the College Policy. However, the College Calendar further provides that

“If the student does not engage with the reasonable accommodations process...and concerns remain in relation to the student’s fitness to participate in professional placements, the case shall be dealt with in accordance with (the normal procedures)”

If the School refers a student to the Disability Service, they should inform the student that a failure to engage with the process may adversely affect the student in the event that a fitness to practise issue arises.

**e) Student Mental Ill Health and other health concerns**

In some cases, fitness to practise issues may derive in the first instance, in whole or in part, from a student’s mental ill health or some other health concerns. In these cases, the matter should not in the first instance be dealt with under the Fitness to Practise Policy, but under Schedule 3 of the Chapter on Student Conduct and Capacity of the 2010 Statutes.

If concerns about a student’s mental health or some other health concerns arise at the same time as a fitness to practise investigation but the concerns are not related to the fitness to practise concerns, the fitness to practise investigation must be paused until the issues related to the student’s mental health are resolved.

**3.3 Other fitness to practise cases**

Fitness to practise cases that do not constitute disciplinary offences should be referred by the Junior Dean, Director or other person to whom this function has been delegated, as the case may be, to the School Fitness to Practise Committee, subject to the proviso that where it is known that the case involves a student with a disability (whether or not the student is registered with the Disability Service), the School must comply with the guidelines set out in section 4 of Schedule 1 of the Chapter on Student Conduct and Capacity in the 2010 Statutes, entitled ‘Student Discipline’ before the case can be referred to the School Fitness to Practise Committee. The Director must request the student’s tutor or postgraduate advisor to ascertain whether the student has a disability, whether disclosed or hitherto undisclosed. Where a fitness to practise issue arises in other contexts before other committees, such as in the course of an academic appeal being pursued by a student, Course Office based Court of First Appeal, School based Court of First Appeal, Faculty based Court of First Appeal, the Academic Appeals Committee, the Graduate Studies Committee, and the like, then each such other committee shall have a discretion to refer that issue to the relevant School Fitness to Practise Committee if this is considered a more appropriate way of dealing with the matter.

The following describes a number of possible breaches of the Code of Conduct for Pharmacy Students of the School of Pharmacy and Pharmaceutical Sciences and/or the disciplinary rules of a practice experience provider that could result in referral to the School FTP Committee. This list is indicative rather than exhaustive:

1. The demonstration of irresponsible behaviour e.g. through persistent and frequent absences without explanation or prior notice, and/or persistent and frequent late attendance or failure to record attendance sheets as required. **
2. The demonstration of persistent unprofessional behaviour e.g. through rudeness, swearing, inappropriate remarks, slovenly or unclean appearance. **
3. The demonstration of unprofessional behaviour in speaking to/dealing with patients/clients;
4. Appearing in the practice experience establishment under the influence of alcohol or drugs;
5. Breaking confidentiality of a patient/client;
6. Inappropriate/abusive behaviour towards a patient/client;
7. Altering records of any kind without permission, or forging another person’s signature;
8. Misuse of drugs in the classroom or college;
9. Malicious damage to practice experience provider’s property;
10. Malicious damage to practice experience provider’s reputation;
11. Demonstration of disrespect for the Pharmacy Regulator (PSI) or the profession;
12. Unsafe practice with due recognition of the student’s stage in the programme
13. Health concerns and lack of insight or management of these concerns: failure to seek appropriate medical treatment or other support; failure to follow medical advice or care plans, including monitoring and reviews, in relation to maintaining fitness to practise; failure to recognise limits and abilities or lack of insight into health concerns; treatment-resistant conditions, which might impair fitness to practice

** It is understood that an initial transgression under the headings of 1 and 2 above may be
deal with by the most relevant person in the practice experience provider, usually by giving advice/censure. Repeated transgressions following such advice, however, may be reported to the relevant Director of Teaching and Learning.

3.4 Powers to suspend

Where student behaviour threatens the well-being of patients, students or staff, the Director or an appropriate member of the work experience-based staff (preceptor pharmacists who supervise and assess pharmacy students in the workplace) has the power to suspend the student with immediate effect (section 2(4) of Schedule 5 of the Chapter on Student Conduct and Capacity in the 2010 Statutes, entitled ‘Fitness to Practise’). This is in addition to the powers of the School Fitness to Practise Committee and the College Fitness to Practise Committee pursuant to section 3 of the Schedule to recommend the suspension of a student. Moreover, these powers are without prejudice to other powers to suspend students in other circumstances, such as the power of the Junior Dean under Schedule 3 to the Chapter on Student Conduct and Capacity to suspend a student with mental health difficulties where the student constitutes a clear and reasonably imminent danger to himself/herself or to others.

4. CONDUCTING A FULL INVESTIGATION

4.1 Initial investigation of issues of concern regarding fitness to practice

1. When there is an alleged issue of fitness to practice regarding student conduct while the student is on practice experience, that cannot be dealt with through local mechanisms, the student’s supervisor in the practice experience establishment may contact the relevant Director of Teaching and Learning in the School of Pharmacy and Pharmaceutical Sciences outlining these concerns in writing and providing relevant written evidence.

2. It is acknowledged that, in the case of serious concerns about conduct or alleged breach of the Code or of the practice experience establishment rules, it may be necessary for the practice experience provider to take action, including temporary suspension from practice if required, pending the decision of the School Fitness to Practise Committee.

3. When there is alleged concern regarding a student’s conduct arising from assessment, assignments, or while the student is attending classroom teaching, laboratories and/or examinations in College, the relevant staff member should contact the relevant Director of Teaching and Learning in the School of Pharmacy and Pharmaceutical Sciences outlining these concerns in writing and providing relevant evidence. For disciplinary matters, School staff may also refer directly to the Junior Dean. In the case of serious concerns about the student’s conduct or risk of self harm or harm to others, it may be necessary to suspend the student temporarily from the classroom.

4.2 Collection of evidence

Where fitness to practise concerns arises, they shall be referred in the first instance to the relevant Director of Teaching and Learning in the School of Pharmacy and Pharmaceutical Sciences (a function which has been delegated to the Directors by the Head of School, and which may be delegated to another appropriate office holder in the School if there is any actual/perceived conflict of interest). The Director shall therefore normally be the investigator. The Investigator should not be a member of the School Fitness to Practise Committee. He/she may act as the representative of the School of Pharmacy during the hearing.

The Investigator should collect evidence related to the incident which has triggered the procedure and general information about the student’s past progress on the course which relates to the investigation. This evidence should be circulated to the student in advance of the hearing so that he/she is aware of the case against him/her. The School Fitness to Practise Committee should give the student an opportunity to make submissions in writing, but this should not preclude the student from raising additional arguments in the hearing in response to representation from the School of Pharmacy and Pharmaceutical Sciences.

The student and representative should be informed of their entitlement to collect evidence to support their case, and the School of Pharmacy/College should assist the student in obtaining any such evidence.

The collection of evidence should be done in a timely and diligent manner.
4.3 Timely investigation

Any issues that arise should be investigated in a timely manner and should avoid unnecessary delays, especially where this delay will prejudice the student. This includes delays in notifying the student of concerns. The need to complete the investigation in a timely manner must be balanced against the need to investigate the matter diligently.

1. Upon the referral of a fitness to practise issue to the Director, he/she or the person to whom the investigation has been delegated should endeavour to investigate the issue in a timely and diligent manner.

2. Once the Director or the person to whom the investigation has been delegated has determined that the matter should be referred to the School Fitness to Practise Committee, the student must be notified of these arrangements within five working days.

3. A student and tutor or postgraduate advisor should be notified of a requirement to present to a fitness to practise hearing, the nature of the allegation and the time and place of the hearing at least five working days in advance of the hearing.

4. The notification may contain a summary of the allegations of the case against the student if the School is unable to present the full details of the case against him/her at that time.

5. The School of Pharmacy and Pharmaceutical Sciences must have fully prepared its case within five working days of the student receiving notification of the concerns. The School may request the Chair for an extension on this time period, which shall in any case be no more than five working days. In determining whether to grant this extension, the Chair should have regard to all the circumstances of the case, including the complexity of the issues, the time period that the allegations cover and the severity of consequences for the student.

6. The student and representative should have prior sight of full details of the case at least five working days in advance of the hearing to allow him/her an appropriate period of time to prepare their case. Papers received late should not be taken into account without the consent of the student.

7. A student or representative may request of the Chair an extension on this time period, which shall in any case be no more than five working days. In determining whether to grant this extension, the Chair should have regard to all the circumstances of the case, including the complexity of the issues, the time period that the allegations cover and the severity of consequences for the student.

8. Written submissions from a student should be submitted to the Chairperson or secretary by 9am on the working day before the hearing.

9. The decision of the School Fitness to Practise Committee should be communicated in writing to the student within five working days.

4.4 The hearing

1. The secretary, on behalf of the Committee, shall notify all parties of the names and roles of the attendees, including representatives and witnesses (if applicable).

2. At the start of the hearing, the Chair of the Committee will introduce the members of the Committee, explain the role of the Committee and outline the running order of the proceedings and the onus and the standard of proof.

3. The onus of proof shall be on the School of Pharmacy and Pharmaceutical Sciences to prove that a student is not fit to practise, and the standard of proof shall be the civil standard of proof; i.e. whether on the balance of probabilities the student is or is not fit to practise.

4. The School representative will make the case for the School, including the hearing of witnesses if applicable. The student or representative will have the opportunity of questioning the School representative and/or witnesses on any evidence that has been put forward.

5. The Chairperson may invite members of the Committee to ask questions or seek further clarification in relation to the specific allegation.

6. The student or representative will make the case for the student, including the hearing of witnesses if applicable. The School representative will have the opportunity of questioning the student or representative and/or witnesses on
any evidence that has been put forward.

7. The Committee shall consider the evidence with regard to
   a) The need to safeguard vulnerable groups
   b) Child protection and safety
   c) Public protection and safety
   d) Professional codes of conduct
   e) The student’s academic progress on the programme
   f) Any potential risk to the College, staff, students or other individuals
   g) The standards required in the core competencies of concern outlined by the School, where applicable

8. The Committee shall not take into account evidence that was not made available to both parties during the course of the investigation or hearing.

9. The Committee shall reach a decision and make recommendations based on all the available evidence.

10. In the absence of a unanimous verdict, the decision of the majority shall prevail. In the case of an even split, the Chair of the Committee shall have a second and casting vote. The secretary, while in attendance, will not have a vote or take part in any decision making.

11. A summary note recording the decisions and recommendations relating to the case presented to the Committee will be produced and made available to the student. This will include reasons for the decision. Verbatim minutes will not be recorded.

12. The Chair of the Committee should inform both the student and representative in writing about the outcome of the hearing, the reasons for the decision and any relevant rights of appeal. The communication should be neutral and refrain from commenting on the likelihood of success at appeal, and should take place within five working days of the hearing.

13. The secretary should ensure that the relevant College staff and offices are notified of the Committee’s decision where appropriate, e.g. for the maintenance of the student record.

4.5 Decisions of the School Fitness to Practise Committee

1. Where the Committee decides that concerns relating to a student’s fitness to practise are well founded, it may take any of the following actions:
   (a) caution the student in relation to the matter;
   (b) recommend that the student be required to undergo testing in respect of suspected drug or alcohol misuse;
   (c) recommend that the student be required to undergo a medical examination or assessment, which may include psychiatric assessment;
   (d) recommend that the student withdraw from the course;
   (e) recommend that the student be suspended from the course;
   (f) following consultation with the Senior Lecturer (in the case of undergraduate students) or the Dean of Graduate Studies (in the case of postgraduate students), require the student to complete such academic exercise, including a placement, as shall be prescribed by the Committee; or
   (g) refer the matter or any aspect thereof to the Dean of Students to be dealt with pursuant to any other Schedule to the Chapter on Student Conduct and Capacity in the 2010 Consolidated Statutes.

2. (a) In the case of undergraduate students, recommendations pursuant to sub-section 1(b)-(e) shall be made to the Senior Lecturer.
   (b) In the case of postgraduate students, recommendations pursuant to sub-section 1(b)-(e) shall be made to the Dean of Graduate Studies.
   (c) Such recommendations shall not take effect until they are approved by the Senior Lecturer or the Dean of Graduate Studies, as the case may be.
3. Students
(a) who fail to comply with an approved recommendation made pursuant to sub-section 1(b) or (c),
b) whose tests pursuant to sub-section 1(b) confirm drug or alcohol misuse, or
c) who are assessed pursuant to sub-section 1(c) to be unfit to continue with their studies or to be unable or unsuitable to participate in their courses of study to the standard required by College, may be required by the Committee either to withdraw from their courses of study or to go off-books until such time as they submit a letter - from an appropriately qualified person as defined by sub-section 1 of the Certification Section - to the Committee certifying that they are fit to proceed with their courses of study.

4. Students who have been suspended pursuant to sub-section 1(d) shall not be re-admitted until such time as they submit a letter - from an appropriately qualified person as defined by sub-section 1(a) of the Certification Section - to the Committee certifying that they are fit to proceed with their courses of study.

5. Where a test or examination or assessment is required pursuant to the terms of this section, the Committee shall nominate an appropriately qualified person as defined by sub-section 1(b) of the Assessment Section to undertake it.

4.6 Appeals
An appeal against the decision of the School Fitness to Practise Committee may be taken to the College Fitness to Practise Committee by either party to the original decision. The College Fitness to Practise Committee shall consist of a chairperson who is a practising lawyer, two members of staff drawn from disciplines that have fitness to practice requirements and two external (i.e., non-staff) members, one of whom shall be drawn from the discipline of pharmacy (practising pharmacist from outside College) and the other of whom shall be a lay person. The secretary to the College Fitness to Practise Committee who shall be appointed by Board shall not be a member of the Committee but shall attend in full all meetings of the Committee for record keeping and administrative purposes.

According to section 4(3) of Schedule 5, a party wishing to appeal against a decision of a School Fitness to Practise Committee shall, "within fifteen days of the date on which the decision has been communicated to the parties", notify the secretary to the College Committee in writing of his/her intention to appeal, and section 17(1) of the Introduction Chapter to the 2010 Statutes explains that "day" in this context "includes any day of the Academic Year, and excludes Saturdays, Sundays and public holidays". When the secretary to the College Committee has been so notified of an intention to appeal, s/he shall request the chairperson of the School Fitness to Practise Committee to forward a note of that Committee’s decision to the secretary of the College Fitness to Practise Committee. The party taking the appeal shall, within a further 15 days (as above defined) from serving notice of the intention to appeal, provide the secretary to the College Committee with a written statement of the grounds of appeal. The secretary to the Committee shall provide this statement to the other party to the appeal, requesting a written response for consideration by the College Fitness to Practise Committee. The Committee may consider any other documents submitted by either party to the original decision in advance of the hearing, provided such documents are also provided to the other party as soon as practicable after their provision to the secretary. At the hearing, the College Committee may admit any evidence it deems relevant.

In dealing with an appeal, the College Fitness to Practise Committee shall follow the procedures set out in section 4 of Schedule 5 of the Chapter on Student Conduct and Capacity in the 2010 Statutes, entitled ‘Fitness to Practise’. The student shall have the same rights and entitlements before the College Fitness to Practise Committee as s/he enjoyed before the School Fitness to Practise Committee.
Where a member of College staff/practice-based staff/ other appropriate individual has a concern regarding a student's fitness to practice

Member of staff refers student case to the relevant Director

Directors check for record of disability within the School. Where there is no such record, the Director must request the student's tutor or postgraduate advisor to meet with the student to encourage disclosure of any undisclosed disability.

If a student has a disability, the Director consults with the Junior Dean and the Disability Officer. If a student does not have a disability, the Director consults with the Junior Dean.

The Director/Junior Dean must first consider whether the concern could fall under disciplinary cases or some other procedures.

**Fitness to practise**

If a student has a disability, section 4 of Schedule 1 of the Chapter on Student Conduct and Capacity in the 2010 Statutes shall apply.

**Student mental ill health/health concerns** dealt with in accordance with Schedule 2 to Chapter on Student Conduct in 2010 Statutes. Case referred to the School Fitness to Practise Committee.

**Garda Vetting** dealt with in accordance with Garda Vetting policy & procedures for UG & PG 2009.

**Disciplinary cases**

An appeal against the decision of the School Fitness to Practise Committee may be taken to the College Fitness to Practise Committee which should follow the procedures set out in section 4 of Schedule 5 of the Chapter on Student Conduct and Capacity in the 2010 Statutes.
CODE OF CONDUCT

You are preparing to enter a profession which carries certain expectations and requirements. Membership of a healthcare profession requires the highest standards of professional and ethical conduct. During your education and training you are also obliged to abide by a set of standards. The Code of Conduct (“the Code”) outlines the defined standards and the principles by which you must abide in the academic, clinical and professional environment. You must formally agree to abide by the Code. Every student is personally responsible under the code for his/her own acts or omissions. Compliance with these standards is considered as evidence of fitness to practise.

The Code is based on six core principles:

1. Your primary concern must be to maintain and improve the health, wellbeing, care and safety of patients.
2. Develop your professional competence, skills and standing so as to bring health gain and value to the community and society.
3. Be honest and trustworthy and show respect for others.
4. Conduct yourself in a manner which enhances the service provided to society and which will maintain the good name of your profession.
5. Maintain your professional knowledge and competence.
6. Be aware of your obligations under the Code of Conduct and do not do anything which constitutes a breach of the Code.

The Higher Education Institution with which you are registered as a student (referred to in this Code as “College”) takes seriously any breach of the Code. If your behaviour fails to meet the standards outlined in the Code, the matter may be referred in accordance with the Higher Education Institution’s relevant policies and regulations. Decisions will be made on a case by case basis and will be judged by reference to the principles set out in the Code.

The following information is to direct you on the proper use of the Code in terms of your relationships and interactions with staff, fellow students, placement tutors, patients, carers, and other individuals with whom you come into contact.
Principle 1

- **Your primary concern must be to maintain and improve the health, wellbeing, care and safety of patients.**

Throughout your education and training you are required to develop knowledge, skills, attitudes and values intrinsic to your practise as a competent healthcare professional. As part of your course you will engage with patients and gain knowledge and experience in the clinical and professional setting. Even when you are not in direct contact with patients, you must make the health, well-being and safety of patients your main concern. All other principles must be read in light of this first principle.

*As a student you must:*

1.1 Always bear in mind your future role as a healthcare professional when studying. This applies equally to all aspects of your education and training.
   1.1.1 Take responsibility for your work, studies and behaviour.
   1.2.1 Apply your learning for the maximum benefit of patients.
   1.2.2 Behave in a trustworthy and professional manner.

1.2 Ensure that your beliefs and actions do not compromise patient care.
   1.2.1 Recognise and respect the rights of patients.
   1.2.2 Never discriminate on the basis of gender, religion, age, civil status and family status, disability, sexual orientation, race ethnicity, or membership of the Travelling community.
   1.2.3 Be prepared to undertake physical examination of patients if appropriate.
   1.2.4 Adhere to the dress codes of the College, clinical and professional environment (clinical and professional placements).

1.3 Never knowingly allow your judgment to be influenced by personal interests.
   1.3.1 Do not abuse the trust of a patient and maintain proper professional boundaries, especially with children and vulnerable adults.
   1.3.2 Do not make decisions for personal interest or gain that in any way may adversely affect the health and welfare of patients and the public.

1.4 Never knowingly mislead others.
   1.4.1 You should introduce yourself by name to patients and always make it clear to patients and the public that you are a student and not a qualified healthcare professional.
   1.4.2 You must never recommend a medical treatment or course of action to anyone unsupervised.
   1.4.3 You should never misrepresent data or information that could adversely affect the health and welfare of patients and the public.

1.5 Never compromise patient care.
   1.5.1 Raise concerns as soon as possible with an appropriate member of staff if you believe that patient safety or care could be compromised.
   1.5.2 Be prepared to challenge the judgement of others if you have reason to believe that their decisions could compromise safety of care.
Principle 2

- **Develop your professional competence, skills and standing so as to bring health gain and value to the community and society.**

  It is your responsibility to acquire all necessary knowledge, skills, values, attitudes and behaviours to become a competent practitioner and not impede other students in acquiring the same knowledge and skills. This should guide you in your academic education, training and during clinical and professional placements

**As a student you must:**

2.1 Take responsibility for your learning.
   2.1.1 Use every opportunity to learn. Attend classes. Be punctual. Be contactable. Plan and use your time effectively.
   2.1.2 Reflect on feedback about your performance and respond constructively.
   2.1.3 Make informed decisions.

2.2 Engage constructively in assessment.
   2.2.1 Complete and submit your course work on time.
   2.2.2 Appropriately reference the academic work of others.
   2.2.3 Never misrepresent data, coursework or information that could result in the awarding of a grade not reflective of your competence.

2.3 Recognise and stay within the limits of your competence.
   2.3.1 Recognise your limitations and ask for help, where and when appropriate.

Principle 3

- **Be honest and trustworthy and show respect for others.** Demonstrating respect for the dignity, views and rights of others is fundamental in forming and maintaining appropriate relationships with academic staff, fellow students, placement tutors, patients, carers, and other individuals with whom you come into contact. All health professionals must be guided by their primary responsibility to act in the best interests of their patient without influence of any personal consideration. The patient-health professional relationship is a privileged one and is based on trust and professionalism which are enshrined in the ethical principles of beneficence, non-maleficence, autonomy and justice.

**As a student you must:**

3.1 Act in the best interest of the patient and contribute to the safety of patients.

3.2 Accept and agree to be bound by the ethical principle of autonomy.
   3.2.1 Obtain consent from the patient before you interview or examine him or her. The patient should be offered a chaperone as appropriate. In the case of a minor patient, obtain the consent of the parent or legal guardian before you interview or examine the minor patient.
   3.2.2 Respect the patient’s right to refuse health care or to take part in teaching.

3.3 Preserve the confidentiality of the patient at all times. This includes personal data that is in their clinical records as well as information they disclose to you during a consultation.
3.3.1 Do not share medical information with anyone except those health care professionals involved in the care of the patient.

3.3.2 Make sure that patients, or anyone close to them, cannot be identified outside the clinical setting or protected virtual learning environment. This includes conversations and discussions on social networking sites, texts or e-mails, recordings of interviews or assignments on e.g. smart-phones and/or YouTube, and pictorial records, e.g., photographs and/or video clips.

3.3.4 Recognise the circumstances when confidential information may be disclosed without consent.

3.4 Accept and agree to be bound by the ethical principle of justice.

3.4.1 Recognise and respect the rights of the patient to fair treatment and care.

3.5 Be honest and trustworthy.

3.5.1 Identify yourself truthfully.

3.5.2 Represent your qualifications, position and abilities honestly on all applications.

3.5.3 Do not knowingly mislead others.

3.5.4 Be truthful in verbal and written communications.

3.5.5 Use research and laboratory data honestly and ethically, seeking permission to use data as required.

3.5.6 Ensure any funds you are responsible for are used for the purpose they are intended.

3.5.7 Decline gifts from the pharmaceutical, medical device or biotechnology industries.

3.5.8 Do not plagiarise.

3.5.9 Be truthful in all your interactions with staff in both the College and in professional placements.

Principle 4

- Conduct yourself in a manner which enhances the service provided to society and which will maintain the good name of your College and profession.

The public trusts healthcare professionals. As a student, and throughout your career, you must justify that trust by acting with integrity and professionalism. You should be aware of the importance of looking after your own health and how it impacts on you and your professional responsibilities. You need to develop skills to work on a multidisciplinary team to deliver a high standard of care and ensure patient safety. You need to be able to work effectively with patients, staff, colleagues and healthcare professionals.

As a student you must:

4.1 Recognise the importance of self-care and take responsibility for your own health, especially if it may impact negatively on other people.

4.1.1 Seek prompt and appropriate professional advice about your general wellbeing, i.e. your physical or mental health, or substance use or other issues which may impact on your ability to complete your studies or interact with patients, staff or colleagues.

4.1.2 Inform appropriate staff if there is anything that could impair your ability to study or to practise as a professional.

4.1.3 Inform appropriate staff if you are being affected by a major life event e.g. bereavement that may impair your ability to practise as a professional.

4.1.4 Inform appropriate staff if you have, to your knowledge, any disability or medical condition that might affect your ability or role as a future healthcare professional, or that might put patients at risk.

4.1.5 Inform appropriate staff if you take medicines that may impair your judgment and impact on the safety of others.
4.1.6 Respect the confidentiality of your colleagues but appropriately disclose information of concern to include information regarding 4.1.1 above as relevant to your colleagues.

4.2 Learn how to work in partnership with others in College, on professional placement, and with patients and their carers in the management of their treatment and care.
   4.2.1 Recognise the expertise of healthcare professionals.
   4.2.2 Respect the knowledge and skills of those involved in your education.
   4.2.3 Be aware of the limitations of your knowledge and skills.

4.3 Treat others politely with consideration and respect.
   4.3.1 Recognise diversity and respect the cultural differences, values and beliefs of others.
   4.3.2 Refrain from behaviour that includes intimidation, foul language, threats of violence or retaliation.
   4.3.3 Listen to, and respect, the opinions of others and be non-judgemental in your attitudes toward them.

4.4 Learn how to communicate effectively.
   4.4.1 Ensure you have adequate English Language skills.
   4.4.2 Learn how to listen to patients and their carers and communicate effectively with them in a way they can understand.
   4.4.3 Learn how to communicate effectively with others including academic staff, placement tutors and other healthcare professionals.

Principle 5

- Maintain your professional knowledge and competence

At all stages of your professional journey you must take responsibility for ensuring your knowledge and skills are up-to-date and that you maintain your competence. You have engaged in a career of lifelong learning and teaching.

As a student you must:

5.1 Commit to developing, and continuously improving, your professional knowledge and competence.

5.2 Learn from experience and grow from the knowledge gained from errors to avoid repeating them.

5.3 Ensure that you are aware of continuing professional development requirements.

Principle 6

- Be aware of your obligations under the Code of Conduct and do not do anything which constitutes a breach of the Code.

It is the responsibility of all students to make every reasonable effort to ensure that everything they do conforms with the principles laid down in the Code of Conduct.

As a student you must:

6.1 Ensure you are aware, apply and adhere to the principles of the Code of Conduct.
   6.1.1 Promote and support the principles of the Code of Conduct by example.
   6.1.2 Refrain from any activity that would negatively affect the reputation of the College, or your intended profession.
6.1.3 Report breaches of the Code of Conduct to the appropriate person (e.g. Head of School, member of staff in College or on placements).

6.2 Obey the law.
6.2.1 Inform an appropriate member of staff immediately if you are the subject of any criminal legal proceedings.

6.3 Comply with College Policies, Rules and Regulations, and those of other organisations linked to your studies.
6.3.1 Respect all College, and clinical and professional placement policies, procedures and property. Never willingly cause damage to such property, remove property from the premises in which it is located, or make use of property for personal reasons.
6.3.2 Ensure that you are contactable.
6.3.3 Supply accurate information in response to lawful requests and update that information as necessary.
6.3.4 Cooperate with honesty and openness in formal investigations about you or others.

6.4 Comply with health and safety requirements.
6.4.1 Comply with the College’s health requirements and health policies.
6.4.2 Comply with the College’s, clinical and professional placements’ safety requirements, including dress code and other safety requirements.

This code was guided by the following professional standards:


Guidelines for Medical School on Ethical Standards and Behaviour appropriate for Medical Students (2011) Irish Medical Council

Guide to Professional Conduct and Ethics for Registered Medical Practitioners (2009) Irish Medical Council


We acknowledge the prior permission of Mr Damian Day of the Royal Pharmaceutical Society of Great Britain (RPSGB) to reproduce extracts from the Code of Conduct for Pharmacy Students, written by the RPSGB and adopted by the General Pharmaceutical Council of Great Britain.
A General College Regulations shall apply as set out in the University Calendar, Part 2, Undergraduate Degrees and Diplomas in the chapter ‘General regulations and information’: http://www.tcd.ie/calendar/

Particular attention is drawn to the following:

A1 ILLNESS AT EXAMINATIONS

University Calendar 2015-16, Part 2, General regulation and information, Academic Progress §§33-35:

33 There are two University examination sessions: annual and supplemental. The dates of these examination sessions are given in the Calendar PART I - ALMANACK. Examinations should be confined to these two examination sessions. However, if and when approved by the University Council, certain courses, normally professional, are permitted to hold examinations outside of the standard academic year structure and, in particular, outside of the two University examination sessions. Furthermore, in individual cases, examinations outside these two sessions will only be permitted pursuant to §37. Students are, in the first instance, required to present for examination at the annual session for their class. Students who are unable to complete their examinations at the annual or supplemental session due to illness, disability, or other grave cause beyond their control may apply through their tutor to the Senior Lecturer for permission to repeat the year.

34 Where an examination has been completed, subsequent withdrawal is not permitted. Students who have successfully completed an examination and are qualified to rise with their year are not permitted to repeat the examination.

35 Students who consider that illness may prevent them from attending an examination (or any part thereof) should consult their medical advisor and request a medical certificate for an appropriate period. If a certificate is granted, it must be presented to the student's tutor within three days of the beginning of the period of absence from the examination. The tutor must immediately forward the certificate to the Senior Lecturer. Medical certificates must state that the student is unfit to sit examinations. Medical certificates will not be accepted in explanation for poor performance.

(a) Where a student becomes ill prior to the commencement of the annual examination, they may seek permission through their tutor from the Senior Lecturer to withdraw and take the supplemental examination in that year.

(b) Where illness prevents a student from completing any part of the annual examination and they withdraw from the examination, permission may be granted for a supplemental examination to be taken in that year.

(c) Where illness occurs during the writing of an examination paper, it should be reported immediately to the chief invigilator. The student will then be escorted to the College Health Centre. Every effort will be made to assist the student to complete the writing of the examination paper.

Students who consider that other grave cause beyond their control may prevent them from attending an examination (or any part thereof) should consult their tutor who should make representations immediately to the Senior Lecturer that permission be granted for absence from the examination.

Regulations (a) and (b) also apply in the case of absence from annual examinations due to other grave cause beyond a student’s control. Regulations (a) and (b) apply only to examinations which are non-final non-degree examinations. However, regulations (a) and (b) apply in all years of those professional courses which permit supplemental examinations in final or degree years.

A2 CONDUCT OF EXAMINATIONS

Candidates for examinations are forbidden to bring books, notes, mobile phones, tablets, laptops or media players with them into an examination hall, to copy from or exchange information with other candidates or in any way make use of information improperly obtained, see University Calendar, Part 2, General regulation and information, Conduct of Examinations, §§43-49. Such actions are regarded as serious offences (see University Calendar, Part 2, General regulation and information, III Conduct and College regulations, §4, for which a student may be expelled from the University. Students must not leave the examination hall before the time specified for the examination has elapsed, except by leave of the invigilator. Examinations or other exercises which are part of continuous assessment are subject to the same rules as other College examinations. Where submitted work is
part of a procedure of assessment, plagiarism is similarly regarded as a serious offence and is liable to similar penalties.

A3  USE OF CALCULATORS IN EXAMINATIONS
Electronic calculators are permitted in certain examinations provided that they are battery operated, pocket sized, silent in operation and are not capable of using previously recorded programmes. The College does not supply calculators. The operation of calculators is entirely the responsibility of the students. No allowance is made for errors or omissions arising from the malfunction of calculators or the misuse of calculators by students. Calculators may not be passed from one candidate to another during examinations. It is essential that the stages of numerical work, including intermediate answers, be written clearly to demonstrate knowledge of the problems and their solutions.

A4  APPEALS
Students may appeal through their Tutors to the School of Pharmacy & Pharmaceutical Sciences Court of First Appeal in the first instance and thereafter to the Academic Appeals Committee, see University Calendar 2015-16, Part 2, General regulation and information, Academic Progress §§33-35.

A5  ACADEMIC PROGRESS
A student may not repeat any academic year more than once and may not repeat more than two academic years, except by special permission of the University Council.

To rise with their class students must:

(i) Attend satisfactorily the lectures given in the modules of their course in each term as required by the University Council and the School of Pharmacy & Pharmaceutical Sciences regulations;

(ii) Perform and complete all laboratory work including project work and dissertations to the satisfaction of the Head of the School or module coordinator concerned; and

(iii) Pass, in accordance with the School of Pharmacy & Pharmaceutical Sciences regulations, the prescribed examinations (including practical tests, continuous assessment components and work experience).

Students undertaking the Junior Freshman year in 2015/16, and thereafter, are required to successfully complete the entire Pharmacy (Integrated) programme (B.Sc. (Pharm.) and M.Pharm. degree courses) within eight years of starting the B.Sc. (Pharm.) course in order to be eligible for the award of Master in Pharmacy. In exceptional circumstances, this period may be extended by one year.

As the new curriculum is introduced year-by-year, students permitted to repeat a course year will be required to undertake the new curriculum if the old curriculum has been phased out in the year they are repeating. Likewise, students returning to the course, having spent a permitted period of time off-books, will undertake the new curriculum if the old curriculum has been phased out in the course year to which they are returning. All such students may be required to take additional modules or exercises, as prescribed by the Head of School, to ensure they are qualified to proceed further.

B  JUNIOR FRESHMAN and SENIOR FRESHMAN STUDENTS
To be successful at examinations, a student will normally be required to pass each module, totaling 60 ECTS. However, the Court of Examiners may allow compensation provided that the student has obtained (and is returned with) an overall average of at least Grade III and provided that the student has

(i) passed modules totaling 55 ECTS and achieve a minimum mark of 40 per cent in the failed module or

(ii) passed modules totaling 50 ECTS and achieve a minimum mark of 45 per cent in the failed module or modules

Compensation will not be allowed where a student is returned as “qualified fail” (QF) in any module.
The following modules cannot be compensated:

**JUNIOR FRESHMAN***
- PH1104  Introduction to Pharmaceutics & Formulations
- PH1105  Mathematical methods and pharmaceutical calculations
- PH11P6  Practice of Pharmacy I

**SENIOR FRESHMAN***
- PH2104  Physical Pharmacy, Formulation and Pharmaceutical Technology
- PH2106  Practice of Pharmacy II

Students who fail to satisfy the examiners at the annual examination must present for a supplemental examination at the beginning of Michaelmas Term. There is no fee for the supplemental examination.

Students who are unsuccessful at the annual examination will normally be given credit for those modules in which they were successful, and will be examined in the supplemental examinations only in those modules in which they are unsuccessful.

Students who are unsuccessful at both an annual and supplemental examination and who have made a serious attempt or have a valid reason for their absence may repeat the year. Repetition requires full attendance at lectures and such other courses as may be prescribed by the Head of the School of Pharmacy & Pharmaceutical Sciences.

Students who have passed the Junior Sophister examination may have the ordinary degree of B.A. conferred if they do not choose to proceed to the Senior Sophister year or if they have failed the SS year. Except by permission of the University Council, on the recommendation of the court of examiners, the ordinary degree of B.A. may be conferred only on candidates who have spent at least three years in the University.

Students may not repeat any academic year more than once within the degree programme and may not repeat more than two academic years within the degree programme, except by special permission of the University Council.

**C1  JF AND SF STUDENTS 2016-17:**
To rise with the year, students must achieve a credit weighted average mark of 50 per cent or higher for the year and accumulate 60 credits by passing all modules outright or through passing by compensation, where permitted.

The degree grades are as follows:
- First Class Honours  70%+
- Second Class Honours  60-69%
- Pass  50-59%

**Penalties:** Marks for repeated continuous assessment components during term-time or late submission of course work may incur penalties.

Supplemental Examination Session: In the Freshmen years, on passing the year in the supplemental examination session, marks will not be capped and the end-of-year result will be recorded as ‘pass at supplemental’ (JF and SF year only).

**B.SC. (PHARM) DEGREE**
In calculating the final degree mark the following proportions will be observed:
- 65% of the final mark will be awarded will be based on the overall mark in the SS year
- 35% of the final mark will be awarded will be based on the overall mark in the JS year
Plagiarism

University Calendar [http://www.tcd.ie/calendar/](http://www.tcd.ie/calendar/), Part 2, General regulations and information, §§82-91:

**82 General**

It is clearly understood that all members of the academic community use and build on the work and ideas of others. It is commonly accepted also, however, that we build on the work and ideas of others in an open and explicit manner, and with due acknowledgement.

Plagiarism is the act of presenting the work or ideas of others as one’s own, without due acknowledgement.

Plagiarism can arise from deliberate actions and also through careless thinking and/or methodology. The offence lies not in the attitude or intention of the perpetrator, but in the action and in its consequences.

It is the responsibility of the author of any work to ensure that he/she does not commit plagiarism.

Plagiarism is considered to be academically fraudulent, and an offence against academic integrity that is subject to the disciplinary procedures of the University.

**83 Examples of Plagiarism**

Plagiarism can arise from actions such as:

(a) copying another student’s work;
(b) enlisting another person or persons to complete an assignment on the student’s behalf;
(c) procuring, whether with payment or otherwise, the work or ideas of another;
(d) quoting directly, without acknowledgement, from books, articles or other sources, either in printed, recorded or electronic format, including websites and social media;
(e) paraphrasing, without acknowledgement, the writings of other authors.

Examples (d) and (e) in particular can arise through careless thinking and/or methodology where students:

(i) fail to distinguish between their own ideas and those of others;
(ii) fail to take proper notes during preliminary research and therefore lose track of the sources from which the notes were drawn;
(iii) fail to distinguish between information which needs no acknowledgement because it is firmly in the public domain, and information which might be widely known, but which nevertheless requires some sort of acknowledgement;
(iv) come across a distinctive methodology or idea and fail to record its source.

All the above serve only as examples and are not exhaustive.

**84 Plagiarism in the context of group work**

Students should normally submit work done in co-operation with other students only when it is done with the full knowledge and permission of the lecturer concerned. Without this, submitting work which is the product of collusion with other students may be considered to be plagiarism.

When work is submitted as the result of a group project, it is the responsibility of all students in the group to ensure, so far as is possible, that no work submitted by the group is plagiarised.

**85 Self plagiarism**

No work can normally be submitted for more than one assessment for credit. Resubmitting the same work for more than one assessment for credit is normally considered self-plagiarism.

**86 Avoiding plagiarism**

Students should ensure the integrity of their work by seeking advice from their lecturers, tutor or supervisor on avoiding plagiarism. All schools and departments must include, in their handbooks or other literature given to students, guidelines on the appropriate methodology for the kind of work that students will be expected to undertake. In addition, a general set of guidelines for students on avoiding plagiarism is available on [http://tcd- ie.libguides.com/plagiarism](http://tcd-ie.libguides.com/plagiarism).

87 If plagiarism as referred to in §82 above is suspected, in the first instance, the Director of Teaching and Learning (Undergraduate), or their designate, will write to the student, and the student’s tutor advising them of
the concerns raised. The student and tutor (as an alternative to the tutor, students may nominate a representative from the Students’ Union) will be invited to attend an informal meeting with the Director of Teaching and Learning (Undergraduate), or their designate, and the lecturer concerned, in order to put their suspicions to the student and give the student the opportunity to respond. The student will be requested to respond in writing stating his/her agreement to attend such a meeting and confirming on which of the suggested dates and times it will be possible for them to attend. If the student does not in this manner agree to attend such a meeting, the Director of Teaching and Learning (Undergraduate), or designate, may refer the case directly to the Junior Dean, who will interview the student and may implement the procedures as referred to under conduct and college regulations §2.

88 If the Director of Teaching and Learning (Undergraduate), or designate, forms the view that plagiarism has taken place, he/she must decide if the offence can be dealt with under the summary procedure set out below. In order for this summary procedure to be followed, all parties attending the informal meeting as noted in §87 above must state their agreement in writing to the Director of Teaching and Learning (Undergraduate), or designate. If the facts of the case are in dispute, or if the Director of Teaching and Learning (Undergraduate), or designate, feels that the penalties provided for under the summary procedure below are inappropriate given the circumstances of the case, he/she will refer the case directly to the Junior Dean, who will interview the student and may implement the procedures as referred to under conduct and college regulations §2.

89 If the offence can be dealt with under the summary procedure, the Director of Teaching and Learning (Undergraduate), or designate, will recommend one of the following penalties:

(a) Level 1: Student receives an informal verbal warning. The piece of work in question is inadmissible. The student is required to rephrase and correctly reference all plagiarised elements. Other content should not be altered. The resubmitted work will be assessed and marked without penalty;

(b) Level 2: Student receives a formal written warning. The piece of work in question is inadmissible. The student is required to rephrase and correctly reference all plagiarised elements. Other content should not be altered. The resubmitted work will receive a reduced or capped mark depending on the seriousness/extent of plagiarism;

(c) Level 3: Student receives a formal written warning. The piece of work in question is inadmissible. There is no opportunity for resubmission.

90 Provided that the appropriate procedure has been followed and all parties in §87 above are in agreement with the proposed penalty, the Director of Teaching and Learning (Undergraduate) should in the case of a Level 1 offence, inform the course director and where appropriate the course office. In the case of a Level 2 or Level 3 offence, the Senior Lecturer must be notified and requested to approve the recommended penalty. The Senior Lecturer will inform the Junior Dean accordingly. The Junior Dean may nevertheless implement the procedures as referred to under conduct and college regulations §2.

91 If the case cannot normally be dealt with under the summary procedures, it is deemed to be a Level 4 offence and will be referred directly to the Junior Dean. Nothing provided for under the summary procedure diminishes or prejudices the disciplinary powers of the Junior Dean under the 2010 Consolidated Statutes.
The University of Dublin Calendar refers to various levels of plagiarism. What constitutes plagiarism at a particular level, and the consequences of being found to have committed plagiarism at that level, are detailed below. Nothing provided for under the summary procedure diminishes or prejudices the disciplinary powers of the Junior Dean under the 2010 Consolidated Statutes.

<table>
<thead>
<tr>
<th>Range of Penalties</th>
<th>Characteristics of Offence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td>You receive an informal verbal warning from the Director of Undergraduate Teaching and Learning/Postgraduate Teaching and Learning. You have little previous exposure to the norms and conventions of different types of academic work (essays, reports, group or individual projects, dissertations, presentations, etc.) or you bring different cultural assumptions to your work.</td>
</tr>
</tbody>
</table>
| The piece of work in question is inadmissible. You are required to rephrase and reference correctly all plagiarised elements. Other content should not be altered. The resubmitted work will be assessed and marked without penalty. | Your work* demonstrates one or more of the following:  
  - Poor use and/or understanding of referencing conventions, including how to present direct quotations;  
  - Poor understanding of how to acknowledge sources of direct and indirect quotations;  
  - Poor paraphrasing skills;  
  - Lack of recognition of the boundary between material in the public domain which does not require acknowledgement and that which does;  
  - Poor understanding that borrowing the language of another author for stylistic purposes constitutes plagiarism. |
| **Level 1 Plagiarism is not deemed to be academic misconduct**                       | Generally, only small amounts of material (text, graph, computer code, images, etc.) are unacknowledged. If more substantial amounts are involved, the offence should be classified as Level 2 or 3 plagiarism. |
| **Level 2**                                                                        | You receive a formal written warning from the Head of School. Level 2 Plagiarism occurs when you should have been aware of what constitutes plagiarism. |
| The piece of work in question is inadmissible. You are required to rephrase and reference correctly all plagiarised elements. Other content should not be altered. The resubmitted work will receive a reduced or capped mark depending on the seriousness/extent of plagiarism. | Your work* demonstrates one or more of the following:  
  - Failure to utilise referencing conventions, including the use of direct quotations;  
  - Failure to acknowledge public and private domain sources;  
  - Paraphrasing without appropriate recognition;  
  - Sections copied from other sources and presented as your own;  
  - Borrowing the language of another author for stylistic purposes, knowing that it is incorrect to do so. |
| **Level 2 Plagiarism is considered as academic misconduct**                         | Level 2 Plagiarism occasions when you should have been aware of what constitutes plagiarism. |
| **Level 3**                                                                        | You receive a formal written warning from the Head of School. Level 3 Plagiarism occurs when you should have been aware of what constitutes plagiarism. |
| The piece of work in question is inadmissible. There is no opportunity for resubmission. | Your work* demonstrates one or more of the following:  
  - It contains elements of another student’s work, even if they gave you permission to use their work;  
  - You have submitted, on more than one occasion for credit, a correctly cited and referenced assignment from your own research. This work may have been submitted either in whole or in part, for separate marks in a different module or in previous years;  
  - Substantial sections copied from other sources and presented... |
<table>
<thead>
<tr>
<th>Level 3</th>
<th>Plagiarism is considered as academic misconduct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>It borrows, substantially, material and/or language from a source without correct acknowledgement;</td>
</tr>
<tr>
<td></td>
<td>It makes extensive use of synonyms instead of the author’s original voice, but keeps to the same structure and meaning of the original work;</td>
</tr>
<tr>
<td></td>
<td>It contains fabricated referencing, is without referencing or citation, or lacks, to a large degree, appropriate citation and/or referencing.</td>
</tr>
</tbody>
</table>

**Level 4**

Case referred to the Junior Dean for disciplinary procedures

Level 4 plagiarism cannot normally be dealt with under summary procedures (Levels 1-3 above). The following constitute examples of Level 4 plagiarism:

- You have previously committed plagiarism and this is a repeat offence;
- You have sought, bought or commissioned work with the intention of representing it as your own work;
- You have improperly enlisted editorial input, e.g., engaging a paid proof reader, having a language assignment edited by a native speaker where language competence is being assessed;
- Your submitted assignment is identical to another student’s work, even if they gave you permission to use their work.

*The term ‘work’ refers to individual or group work*
GUIDELINES ON MARKING

YEARS 1 & 2 (FRESHMAN YEARS)

Guidelines on awarding grades for essays and examination answers in the freshmen years

<table>
<thead>
<tr>
<th>Class</th>
<th>Mark Range</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>70-100</td>
<td>Full understanding of concepts coupled with excellent knowledge of subject. Evidence of extra reading. A structured answer. Minor lapses of content or presentations tolerated at lower end of range.</td>
</tr>
<tr>
<td>II</td>
<td>60-69</td>
<td>Good understanding of concepts supported by broad knowledge of subject. A lapse of content or several lapses of detail are tolerated at lower end of range.</td>
</tr>
<tr>
<td>III</td>
<td>50-59</td>
<td>Understands basic concepts and has sound knowledge of subject. Suffers from more than one substantial omission, error or misunderstanding. Answer sometimes lacks structure and suffers from omissions, errors and misunderstandings. Overall, a weak but adequate answer, or marginally adequate at bottom end of range.</td>
</tr>
<tr>
<td>F1</td>
<td>40-49</td>
<td>Basic understanding and knowledge of subject is poor. While some items of sound material may be presented the answer is inadequate. Answer lacks structure and suffers from omissions, errors and misunderstandings. Overall, a limited understanding and knowledge of subject.</td>
</tr>
<tr>
<td>F2</td>
<td>0-39</td>
<td>Basic understanding and knowledge of subject is very poor. At lower range lacks understanding with little knowledge of subject. Answer contains only few items related to question with serious errors. Could also be taken as a response to the misinterpretation of the question.</td>
</tr>
</tbody>
</table>
GUIDELINES ON MARKING

YEARS 3 & 4 SOPHISTER YEARS, YEAR 5 AND SCHOLARSHIP EXAM

Guidelines on awarding grades for essays and examination answers in the Sophister years, the 5th year and the Scholarship examination

<table>
<thead>
<tr>
<th>Class</th>
<th>Mark Range</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>90-100</td>
<td>IDEAL ANSWER; showing insight and originality and wide knowledge. Logical, accurate and concise presentation. Evidence of reading and thought beyond course content. Contains particularly apt examples. Links materials from lectures, practicals and seminars where appropriate.</td>
</tr>
<tr>
<td></td>
<td>80-89</td>
<td>OUTSTANDING ANSWER; falls short of the ‘ideal answer either on aspects of presentation or on evidence of reading and thought beyond the course. Examples, layout and details are all sound.</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>MAINLY OUTSTANDING ANSWER; falls short on presentation and reading or thought beyond the course, but retains insight and originality typical of first class work.</td>
</tr>
<tr>
<td>II</td>
<td>65-69</td>
<td>VERY COMPREHENSIVE ANSWER; good understanding of concepts supported by broad knowledge of subject. Notable for synthesis of information rather than originality. Sometimes with evidence of outside reading. Mostly accurate and logical with appropriate examples. Occasionally a lapse in detail.</td>
</tr>
<tr>
<td></td>
<td>60-64</td>
<td>LESS COMPREHENSIVE ANSWER; mostly confined to good recall of coursework. Some synthesis of information or ideas. Accurate and logical within a limited scope. Some lapses in detail tolerated.</td>
</tr>
<tr>
<td>III</td>
<td>55-59</td>
<td>SOUND BUT INCOMPLETE ANSWER; based on coursework alone but suffers from a significant omission, error or misunderstanding. Usually lacks synthesis of information or ideas. Mainly logical and accurate within its limited scope and with lapses in detail.</td>
</tr>
<tr>
<td></td>
<td>50-54</td>
<td>INCOMPLETE ANSWER; suffers from significant omissions, errors and misunderstandings, but still with understanding of main concepts and showing sound knowledge. Several lapses in detail.</td>
</tr>
<tr>
<td>F1</td>
<td>45-49</td>
<td>WEAK ANSWER; limited understanding and knowledge of subject. Serious omissions, errors and misunderstandings.</td>
</tr>
<tr>
<td></td>
<td>40-44</td>
<td>VERY WEAK ANSWER; a poor answer, lacking substances with some relevant information. Information given may not be in context, but may contain passages and words, which indicate some understanding of the topic.</td>
</tr>
<tr>
<td>F2</td>
<td>0-39</td>
<td>FAILURE; inadequate answer, with little or no substance or understanding and with vague or little knowledge relevant to the question. Could also be taken as a response to the misinterpretation of the question.</td>
</tr>
</tbody>
</table>
GUIDELINES FOR STUDENTS AT EXAMINATIONS

**General**

1. The onus lies on each student to establish the dates, times and venues of their own examinations. No timetable or reminder will be sent to individual students by any office.  
2. An examination number is required for all undergraduate anonymously marked annual and supplemental examinations. A new anonymous examination number will be issued at the start of each academic year. Students must check their anonymous exam number on their personal portal page at my.tcd.ie prior to the commencement of each examination session.  
3. You are expected to familiarise yourself with the location of every examination venue to which you have been assigned.  
4. Mobile phones, or other electronic or communication devices, are not permitted in examination venues - if a phone rings or an alarm on a phone is heard, or it is discovered in any other way in the venue it will be confiscated. Confiscated materials may be retrieved from the Junior Dean's Office, East Theatre (Monday-Thursday, 9.00 am - 2.00 pm only) on payment of a €35 fine per item. This fine is non-negotiable, and no appeals will be accepted by the Junior Dean or any of his Assistants.  
5. Students must follow the instructions given by the invigilators in a co-operative and respectful manner.

**Before entering An examination venue**

6. Find your seat number on the seating list displayed outside and read the accompanying notices.  
7. Leave your personal belongings, including bags, coats, hats, etc at the designated place within or nearby your examination venue. Classrooms are available in the Arts and Hamilton Buildings for the safe-keeping of your personal belongings.  
8. You will not be admitted to the examination after the first half-hour, and will not be allowed to leave during the last half-hour. If you arrive after the first half-hour, contact your College Tutor or his/her replacement as a matter of urgency. If your tutor is not available, contact the Senior Tutor's Office.

**While in an examination venue**

9. Once you have entered a venue, complete SILENCE must be maintained at all times.  
10. Each student must be in possession of their student ID card for each examination session. You should place your student ID card on the right-hand side of your desk for the duration of each examination.  
11. A ‘Clean Desk’ policy applies for all formal examinations. In addition to pens, pencils, rulers, student ID card, etc, only materials permitted for an examination may be placed on the desk. Invigilators will be instructed to request students to remove any non-permitted items from their desk. Pencil cases and calculator covers are not permitted. Students are advised that random pocket searches may be conducted during an examination session. Upon request, students should remove all items from their pockets for scrutiny by an Invigilator. Failure to empty pockets when requested is considered a disciplinary offence and will be referred to the Junior Dean.  
12. Your attention is drawn to the ‘CONDUCT OF EXAMINATIONS’ notice.

**During an examination session**

13. You should check the title of the paper on your desk to ensure that it is the correct examination paper for your course, and read carefully all the instructions given.  
14. You are not allowed start your examination until instructed to do so by the invigilators. Please use any spare time at the start to fill in your answerbook cover(s), remembering to complete the section at the bottom right-hand corner as requested before sealing the flap on every anonymous booklet used. Write legibly in ink – pencils are only allowed for OMR forms.  
15. You will be advised of the time thirty minutes and ten minutes before the end of the examination.  
16. If you wish to leave the examination venue at any stage during the examination you must be escorted by an Invigilator. If necessary you will be accompanied to a bathroom by an Invigilator.  
17. If you wish to leave before the end of the examination you must hand your booklet(s) to an Invigilator and ensure you hand up everything you wish to have marked.  
18. If you are taken ill just before an examination and are unable to sit it, immediately contact your tutor or his/her replacement. If your tutor is unavailable, contact the Senior Tutor's Office. If you feel unwell during your examination, please inform an Invigilator - you will be asked if you wish to go to the College Health Centre and will be accompanied by an Invigilator.  
19. Smoking breaks are not allowed during examination sessions.  
20. Dictionaries and Programmable calculators are not permitted at examinations.

**On completion of an examination session**

21. You will be advised that: 
   - you must immediately stop writing and hand up your booklets when instructed to do so by an Invigilator; 
   - you should ensure that all of your answerbooks are labelled correctly with your examination number (where appropriate), seat number and all other required information; 
   - it is your responsibility to hand in everything you wish to have marked by ensuring all materials are fastened securely with a treasury tag; 
   - you must remain in your seat until all scripts have been collected; 
   - you must not remove from the examination venue answer books, rough work, or other materials supplied.

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1 While every effort will be made to give due notice of major changes, the College reserves the right to amend the examination timetable.

[https://www.tcd.ie/academicregistry/exams/assets/local/guideexam.pdf](https://www.tcd.ie/academicregistry/exams/assets/local/guideexam.pdf)

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CONDUCT OF EXAMINATIONS

Except as provided for below, candidates for examination are forbidden during an examination to do or to attempt to do, any of the following: to have in their possession or consult or use any books, papers, notes, memoranda, mobile phones or written or electronic material of any nature, or to copy from or exchange information with other persons, or in any way to make use of any information improperly obtained.

Where the examination is of such a nature that materials are provided to the candidates, or where the candidates are allowed by the rules of that examination to have materials in their possession, then candidates may of course make use of such materials, but only of such materials, and the general prohibition above continues to apply in respect of any and all other materials.

Where candidates have the prior written permission of the examiner(s), of the Dean of Undergraduate Studies (Senior Lecturer) or the Dean of Postgraduate Studies, or of the Disability Officer, to have materials in their possession during an examination, then candidates may of course make use of such materials, but only of such materials, and the general prohibition above continues to apply in respect of any and all other materials.

Where candidates are allowed to bring personal belongings into the examination venues upon condition that such belongings are stored in an area – such as the back of the venue – away from the area in which the candidates are sitting their examinations, then candidates may bring personal belongings into the hall, provided that they are placed in the indicated area and are not returned to the candidates until they have finished their examinations and are leaving the hall.

Any breach of this regulation is regarded as a major offence for which a student may be expelled from the University.

Students must not leave the hall before the time specified for the examination has elapsed, except by leave of the invigilator.

Examinations or other exercises which are part of continuous assessment are subject to the same rules as other College examinations. Where submitted work is part of a procedure of assessment, plagiarism is similarly regarded as a major offence and is liable to similar penalties.

https://www.tcd.ie/academicregistry/exams/assets/local/guideexam.pdf
School of Pharmacy & Pharmaceutical Sciences
Panoz Institute
East End 4/5
Trinity College Dublin

Basement
East End lecture theatres (LTEE 1/2/3)
- Student computer labs.

Ground floor
T Westland restaurant

1st floor
Dispensing laboratory
Stairwell

School of Pharmacy & Pharmaceutical Sciences

Ground floor
- Lecture Theatre 1 – Salmon
- Lecture Theatre 2 – Synge

1st floor
- Lecture Theatre 3 – MacNeill
- Lecture Theatre 4 – Joly
- Lecture Theatre 5 – Maxwell

2nd floor
- Hamilton library
- Stairs to School of Pharmacy staff offices

Other:
- Undergraduate mailbox (incoming mail)
- Staff mailboxes in lobby

Student health centre
Creche
Botany lecture theatre (BOLT)

Nassau Street entrance
Moyne lecture theatre (MOYNLT)

N
W E
S

Chem. small lecture theatre (CHSLT)
Chem. large lecture theatre (CHLLT)
Chem. science lecture theatre (CHSCLT)

Hamilton shop
€ Bank
T Hamilton restaurant

Stairwell
Page card entry

Trinity College Dublin

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