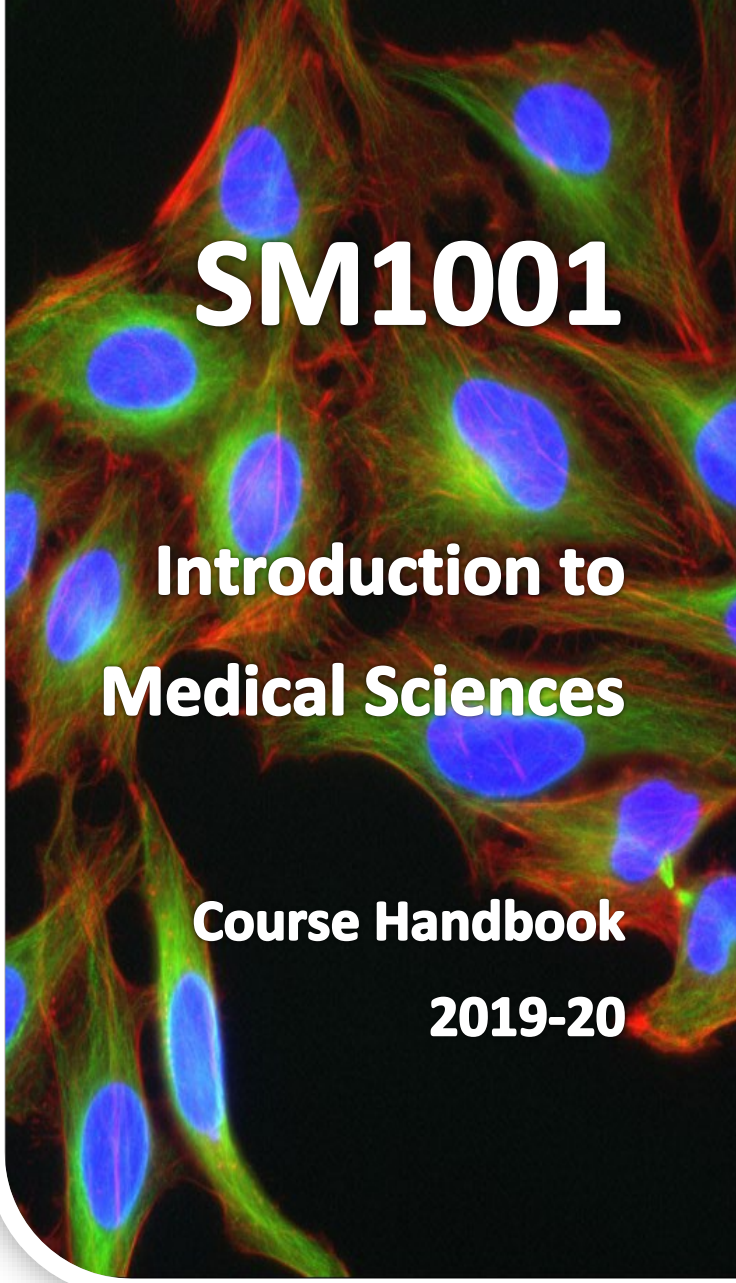
School Of Medicine, Medical Sciences & Nutrition



SM1001

Introduction to Medical Sciences

Course Handbook

2019-20

UNIVERSITY OF ABERDEEN

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Cover image:
Confocal micrograph of fluorescently labelled HeLa cells.
Nuclei are labelled in blue, tubulin in green and actin fibres in red.

Courtesy of:
Kevin Mackenzie
Microscopy and Histology Core Facility
Institute of Medical Sciences
University of Aberdeen
http://www.abdn.ac.uk/ims/microscopy-histology

Course Summary

This course sets out to map many of the key milestones in Medical Science through the ages. From early prehistoric attempts to understand the most basic problems with human health to our current position of knowing the entire human genome, this has been an incredible voyage of discovery. By focussing on some of the most important medical break-through and innovations, the course will demonstrate how we have progressed from a world where health was governed by the gods and illness was caused by evil spirits to our current highly disciplined approach to combat diseases. It will also highlight the ways technological advances have brought about revolutionary changes to the way we diagnose and treat specific diseases and conditions. Throughout the course, the multidisciplinary nature of this broad subject area will be emphasised with a view to identifying the emergence of the core disciplines associated with the School of Medicine, Medical Sciences & Nutrition. There will also be a strong emphasis on the important contributions made by Aberdeen medical scientists to the advancement of medical knowledge and the treatment of disease.

Course Aims & Learning Outcomes

- To provide a basic understanding of the medical sciences in general.
- To provide an overview of medical advancements throughout history.
- To provide an understanding of fundamental aspects of medical sciences applied to you and the wider population.
- To provide knowledge of basic techniques for assessing medically relevant topics.

Course Teaching Staff

Course Co-ordinator(s):

Dr John Barrow (**j.barrow@abdn.ac.uk**)

Prof Gordon McEwan (**g.t.a.mcewan@abdn.ac.uk**)

Other Staff:

Dr Isabel Crane (**i.j.crane@abdn.ac.uk**)

Dr Alison Jack (**a.jack@abdn.ac.uk**)

Dr Pietro Marini (**p.marini@abdn.ac.uk**)

Dr Michael Scholz (**m.e.scholz@abdn.ac.uk**)

Dr Derryck Shewan (**d.shewan@abdn.ac.uk**)

Dr Steve Tucker (**s.j.tucker@abdn.ac.uk**)

Assessments & Examinations

Students are expected to attend **ALL** lectures, practical and lab classes and to complete all exercises by the given deadlines. The minimum performance acceptable for the granting of a class certificate is attendance at 50% of the lectures and practical classes, and presentation

of all set course work. Failure to achieve this may result in your class certificate being withheld. The course assessment consists of 50% continuous assessment based on your marks from all practicals and 50% course exam. Resit assessment will be based on a resit examination constituting 70% of the resit grade; the remaining 30% will come from previous continuous assessment. Your overall performance will be expressed as a grade awarded on the Common Grading Scale (CGS).

Class Representatives

We value students' opinions in regard to enhancing the quality of teaching and its delivery; therefore, in conjunction with the Students' Association we support the Class Representative system.

In the School of Medicine, Medical Sciences & Nutrition we operate a system of course representatives, who are elected from within each course. Any student registered within a course that wishes to represent a given group of students can stand for election as a class representative. You will be informed when the elections for class representative will take place.

What will it involve?

It will involve speaking to your fellow students about the course you represent. This can include any comments that they may have. You will attend a Staff-Student Liaison Committee and you should represent the views and concerns of the students within this meeting. As a representative you will also be able to contribute to the agenda. You will then feedback to the students after this meeting with any actions that are being taken.

Training

Training for class representatives will be run by the Students Association. Training will take place within each half-session. For more information about the Class representative system visit **www.ausa.org.uk** or email the VP Education & Employability **vped@abdn.ac.uk** . Class representatives are also eligible to undertake the STAR (Students Taking Active Roles) Award with further information about this co-curricular award being available at: **www.abdn.ac.uk/careers**.

Problems with Coursework

If students have difficulties with any part of the course that they cannot cope with alone they should notify the course coordinator immediately. If the problem relates to the subject matter general advice would be to contact the member of staff who is teaching that part of the course. Students with registered disabilities should contact Mrs Jenna Reynolds (**medsci@abdn.ac.uk**) in the School Office (based in the IMS, Foresterhill), or Mrs Sheila Jones (**s.jones@abdn.ac.uk**) in the Old Aberdeen office associated with the teaching laboratories,

to ensure that the appropriate facilities have been made available. Otherwise, you are strongly encouraged to contact any of the following as you see appropriate:

- Course student representatives
- Course co-ordinator
- Convenor of the Medical Sciences Staff/Student Liaison Committee (Prof Gordon McEwan)
- Personal Tutor
- Medical Sciences Disabilities Co-ordinator (Dr Derryck Shewan)

All staff are based at Foresterhill and we strongly encourage the use of email or telephone the Medical Science Office. You may have a wasted journey travelling to Foresterhill only to find staff unavailable.

If a course has been completed and students are no longer on campus (i.e work from second semester during the summer vacation), coursework will be kept until the end of Freshers' Week, during the new academic year. After that point, unclaimed student work will be securely destroyed.

Course Reading List

Medical Firsts: From Hippocrates to the Human Genome by Robert E. Adler (2004)
John Wiley & Sons
ISBN: 0471401757

Lecture Synopsis

A series of lectures introducing medical advancements through time and then focusing on four key themes in the Medical Sciences.

Lecture 1: *Course Introduction* – Prof Gordon McEwan & Dr John Barrow
Outline of the course and general introduction

Theme 1: Medicine through the ages (Prof Gordon McEwan)

Lecture 2: *From stone hut to King Tut!*
The history of medicine from very early prehistoric evidence to the Egyptians and how they began on the road to medical understanding.

Lecture 3: *What did the Romans ever do for us?*
Actually, the ancient Greeks and Romans did quite a lot for us. Find out what in this lecture.

Lecture 4: *Out of the dark and into the light*
How the Renaissance paved the way for a modern way of medical thinking.

Lecture 5: *Cows, frogs and quackery*
From the eradication of smallpox to the discovery of nerve impulses and how medical science began to dispel the myths and folklore of the quacks.

Lecture 6: *Do you want it pasteurised?*
How the medical sciences were used in the fight against infection and germ control.

Lecture 7: *Can we cure it?*
The possible future of the medical sciences and where our knowledge will take us will be discussed.

Lecture 8: *Medical ethics* – Prof Gordon McEwan and Dr John Barrow
A real-time voting presentation which will explore your attitudes to challenging ethical issues created by medical science.

Theme 2: It's what's inside that counts (Dr John Barrow & Dr Steve Tucker)

Lecture 9: *Dissecting out the facts* – Dr John Barrow
How did we go from a society that had no knowledge of what makes us human to understanding how we are made?

Lecture 10: *The history of microscopy* – Dr Steve Tucker
A brief history of some of the greatest leaps in the medical sciences that allowed us to see a microscopic world.

Lecture 11: *Light microscopy and histology* – Dr Steve Tucker
A continuation from the previous microscopy lecture, we will discover how medical scientists changed our understanding of how life is constructed through microscopy.

Lecture 12: *Modern microscopy* – Dr Steve Tucker
How do we currently use microscopes? What do they allow us to see? What do they hold for the future of medical research?

Lecture 13: *Seeing the impossible* – Dr John Barrow
How did we make the leap from diagnosis of internal injuries or disease through touch to using x-rays and other imaging tools?

Lecture 14: *Imaging living organs* – Dr John Barrow
How can clinicians see through your body to understand your deepest thoughts? How can they image your internal organs? What does the future hold for medical imaging?

Theme 3: Drug discovery and disease (Dr Steve Tucker & Dr John Barrow)

Lecture 15: *History of opioid pharmacology* – Dr Steve Tucker
What are the opioids? How where they discovered? What are their uses both today and throughout history?

Lecture 16: *Opioids, pain and Kosterlitz* – Dr Steve Tucker
How were the opioids used to treat pain, and who is this Kosterlitz guy?

Lecture 17: *Cannabis through the ages* – Dr Steve Tucker
We all know what cannabis is used for, but how were its properties first discovered and what therapeutic uses does it have?

Lecture 18: *Drug discovery: the rise of Viagra* – Dr Steve Tucker
An example of how a drug developed for treating one condition became particularly useful in an entirely different situation.

Lecture 19: *Discovering insulin* – Dr John Barrow
A look at how insulin was first discovered and how Aberdeen had a huge role to play in its discovery.

Lecture 20: *Pharmacology of addiction* – Dr Steve Tucker
We all have the potential to be addicts. This lecture will discuss the role that the pharmacology plays in us being susceptible to addiction.

Lecture 21: *Is there life after Medical Sciences?* – Prof Gordon McEwan & Dr John Barrow
Of course there is! We will discuss some of the career options open to you after you graduate with your shiny new BSc in the medical science disciplines.

Theme 4: Blood and immunity (Dr Isabel Crane & Dr Alison Jack)

Lecture 22: *The Power of Immunology* – Dr Isabel Crane

Why do we need an immune system? What does it do? What happens if it gets out of control?

Lecture 23: *Harnessing the Power of Immunology* – Dr Isabel Crane

Vaccination was the first step to harnessing the power of Immunology and has had a huge impact on human disease. Since then our ability to use the immune system to combat disease has increased remarkably to the point where it is now the first therapy used to treat some cancers.

Lecture 24: *Blood* – Dr Alison Jack

Blood is important stuff. This lecture will outline all the amazing properties blood has and describe how the blood transfusion process has evolved over centuries from a haphazard, hit or miss affair into a very safe, commonly practiced medical procedure where strong scientific foundations have almost eradicated the catastrophic consequences of mis-matched transfusions. The immunological basis of blood typing will be described to explain this increase in safety and you will have the opportunity to engage with an interactive online blood transfusion lab.

Lecture 25: *Poisons and venoms* – Dr Alison Jack

The world is full of poisonous and venomous plants and animals but have you ever wondered what the killer ingredient in snake venom is or what is in magic mushrooms that causes your head to spin? This lecture will look at all this and more, discussing some of the world's most dangerous plants and animals and explaining why even drinking water can be deadly. We will also look at how poisons can be harnessed for good and used in the treatment of disease.

Theme 5: DNA and the book of life (Dr John Barrow)

Lecture 26: *What's all this "genes" stuff about?*

What are genes? Why are they so important? What is their purpose?

Lecture 27: *DNA + life = molecular biology*

How does molecular biology affect your everyday life? What milestones have led to molecular biology even existing as a science?

Lecture 28: *Are we all mutants?*

This lecture will focus on the mutations that can occur, some good and some bad, in our DNA.

Lecture 29: *Genomes, Pharming and more...*
Do you know what Pharming is? Ever heard of Dolly? This lecture will discuss the science behind some of the recent medical milestones that may affect us all.

Lecture 30: *Final lecture and course review* – Prof Gordon McEwan & Dr John Barrow
Final course review lecture.

Practical/Lab/Tutorial Work

You are expected to attend **ALL** practical sessions to obtain a class certificate. There are practical sessions throughout the course and each practical will be run three times during the week. You should choose a practical grouping via MyTimetable, which should then correlate with Groups A, B or C in the timetable at the back of this course guide. Swaps of practical groups are only possible if discussed with the course-coordinators **as soon as possible** after being assigned a practical group**.** Practical sessions will be based at the **Zoology Building** in **Lab G11**. Attendance will be taken at all practical classes. Practical manuals will be distributed at each practical class and they will be available on MyAberdeen a week before each class is due to start.

Please read through the practical manuals using MyAberdeen so that you have some knowledge of what is expected of you in the practical classes. Below is a brief synopsis of each practical class.

Medical Challenges – This part of the course will run over two sessions, and will culminate in the presentation of your work at a poster symposium. It is designed to provide you with an opportunity to study topical issues in the medical sciences with a chance to carry out some in-depth research. It is also intended as an introduction to carrying out project work on your own, without too much supervision. Over the sessions and in your own time you will design a scientific poster based on a topic of your choice. The first session will involve you working in groups, picking a medically relevant topic and preparing a poster on your chosen topic.

Medical Measurements – This practical class will involve you making basic medically relevant measurements on each other and yourself. This practical will make use of real-time voting to collect data from the class.

Who's the Strongest? – In this practical class you will measure grip strength. You will also gain experience of more detailed measurements using electromyography (EMG) equipment to measure electrical activity in muscle during contractions.

Blood Typing Analysis – This practical class will give you experience of blood typing in a "real life" scenario.

University Policies

Students are asked to make themselves familiar with the information on key institutional policies which been made available within MyAberdeen (**https://abdn.blackboard.com/bbcswebdav/institution/Policies**). These policies are relevant to all students and will be useful to you throughout your studies. They contain important information and address issues such as what to do if you are absent, how to raise an appeal or a complaint and indicate how seriously the University takes your feedback.

These institutional policies should be read in conjunction with this programme and/or course handbook, in which School and College specific policies are detailed. Further information can be found on the **University[1]s Infohub webpage** or by visiting the Infohub.

The information included in the institutional area for 2019/20 includes the following:

- Absence
- Appeals & Complaints
- Student Discipline
- Class Certificates
- MyAberdeen
- Originality Checking
- Feedback
- Communication
- Graduate Attributes
- The Co-Curriculum

Medical Sciences Common Grading Scale

Grade	Grade Point	Category	Honours Class	Description
A1	22	Excellent	First	• Outstanding ability and critical thought • Evidence of extensive reading • Superior understanding • The best performance that can be expected from a student at this level
A2	21			
A3	20			
A4	19			
A5	18			
B1	17	Very Good	Upper Second	• Able to argue logically and organise answers well • Shows a thorough grasp of concepts • Good use of examples to illustrate points and justify arguments • Evidence of reading and wide appreciation of subject
B2	16			
B3	15			
C1	14	Good	Lower Second	• Repetition of lecture notes without evidence of further appreciation of subject • Lacking illustrative examples and originality • Basic level of understanding
C2	13			
C3	12			
D1	11	Pass	Third	• Limited ability to argue logically and organise answers • Failure to develop or illustrate points • The minimum level of performance required for a student to be awarded a pass
D2	10			
D3	9			
E1	8	Fail	Fail	• Weak presentation • Tendency to irrelevance • Some attempt at an answer but seriously lacking in content and/or ability to organise thoughts
E2	7			
E3	6			
F1	5	Clear Fail	Not used for Honours	• Contains major errors or misconceptions • Poor presentation
F2	4			
F3	3			
G1	2	Clear Fail/ Abysmal	-	• Token or no submission
G2	1			
G3	0			

Course Timetable SM1001: 2019-2020

Date	Time	Place	Subject	Session	Staff
Week 7					
Mon 9 Sep	14:00-15:00	NK6	Lecture – Introduction	Lecture	GM,JB
Tue 10 Sep					
Wed 11 Sep					
Thu 12 Sep	13:00-14:00	NK6	Lecture – From stone hut to King Tut!	Lecture	GM
Fri 13 Sep	09:00-10:00	NK6	Lecture – What did the Romans ever do for us?	Lecture	GM
Week 8					
Mon 16 Sep	14:00-15:00	NK6	Lecture – Out of the dark and into the light	Lecture	GM
	15:00-18:00	ZG11	Lab 1A – Medical Challenges I	Practical	JB,ST,GM,PM
Tue 17 Sep	15:00-18:00	ZG11	Lab 1B – Medical Challenges I	Practical	JB,GM,ST,PM
Wed 18 Sep					
Thu 19 Sep	13:00-14:00	NK6	Lecture – Cows, frogs and quackery	Lecture	GM
Fri 20 Sep	09:00-10:00	NK6	Lecture – Do you want it pasteurised?	Lecture	GM
	15:00-18:00	ZG11	Lab 1C – Medical Challenges I	Practical	JB,GM,ST,PM
Week 9					
Mon 23 Sep	14:00-15:00	NK6	Lecture – Can we cure it?	Lecture	GM
Tue 24 Sep					
Wed 25 Sep					
Thu 26 Sep	13:00-14:00	NK6	Lecture – Medical ethics	Lecture	GM,JB
Fri 27 Sep	09:00-10:00	NK6	Lecture – Dissecting out the facts	Lecture	JB
Week 10					
Mon 30 Sep	14:00-15:00	NK6	Lecture – The history of microscopy	Lecture	ST
	15:00-18:00	ZG11	Lab 2A – Medical Measurements	Practical	JB,GM,ST,MS
Tue 1 Oct	15:00-18:00	ZG11	Lab 2B – Medical Measurements	Practical	JB,GM,DS,PM
Wed 2 Oct					
Thu 3 Oct	13:00-14:00	NK6	Lecture – Light microscopy and histology	Lecture	ST
Fri 4 Oct	09:00-10:00	NK6	Lecture – Modern microscopy	Lecture	ST
	15:00-18:00	ZG11	Lab 2C – Medical Measurements	Practical	JB,GM,DS,PM
Week 11					
Mon 7 Oct	14:00-15:00	NK6	Lecture – Seeing the impossible	Lecture	JB
Tue 8 Oct					
Wed 9 Oct					
Thu 10 Oct	13:00-14:00	NK6	Lecture – Imaging living organs	Lecture	JB
Fri 11 Oct	09:00-10:00	NK6	Lecture – History of opioid pharmacology	Lecture	ST
Week 12					
Mon 14 Oct	14:00-15:00	NK6	Lecture – Opioids, pain and Kosterlitz	Lecture	ST
	15:00-18:00	ZG11	Lab 3A – Medical Challenges II / Your degree and you!	Practical	GM,JB
Tue 15 Oct	15:00-18:00	ZG11	Lab 3B – Medical Challenges II / Your degree and you!	Practical	GM,JB
Wed 16 Oct					
Thu 17 Oct	13:00-14:00	NK6	Lecture – Cannabis through the ages	Lecture	ST
Fri 18 Oct	09:00-10:00	NK6	Lecture – Drug discovery: the rise of Viagra	Lecture	ST

	15:00-18:00	ZG11	Lab 3C – Medical Challenges II / Your degree and you!	Practical	GM,JB
Week 13					
Mon 21 Oct	14:00-15:00	NK6	Lecture – Discovering insulin	Lecture	JB
Tue 22 Oct					
Wed 23 Oct					
Thu 24 Oct	13:00-14:00	NK6	Lecture – Course review/evaluation via Ombea	Lecture	GM,JB
Fri 25 Oct	09:00-10:00	NK6	Lecture – Pharmacology of addiction	Lecture	ST
Week 14					
Mon 28 Oct	14:00-15:00	NK6	Lecture – Is there life after medical sciences?	Lecture	GM,JB
	15:00-18:00	ZG11	Lab 4A – Who's the Strongest?	Practical	JB,GM,ST,DS
Tue 29 Oct	15:00-18:00	ZG11	Lab 4B – Who's the Strongest?	Practical	GM,ST,AJ,DS
Wed 30 Oct					
Thu 31 Oct	13:00-14:00	NK6	Lecture – The power of immunology	Lecture	IC
Fri 1 Nov	09:00-10:00	NK6	Lecture – Harnessing the power of immunology	Lecture	IC
	15:00-18:00	ZG11	Lab 4C – Who's the Strongest?	Practical	JB,AJ,GM,ST
Week 15					
Mon 4 Nov	14:00-15:00	NK6	Lecture – Blood	Lecture	AJ
Tue 5 Nov					
Wed 6 Nov					
Thu 7 Nov	13:00-14:00	NK6	Lecture – Poisons and venoms	Lecture	AJ
Fri 8 Nov	09:00-10:00	NK6	Lecture – What's all this "genes" stuff about?	Lecture	JB
Week 16					
Mon 11 Nov	14:00-15:00	NK6	Lecture – DNA + life = molecular biology	Lecture	JB
	15:00-18:00	ZG11	Lab 5A – Blood typing analysis	Practical	JB,ST,PM,MS
Tue 12 Nov	15:00-18:00	ZG11	Lab 5B – Blood typing analysis	Practical	JB,GM,DS,MS
Wed 13 Nov					
Thu 14 Nov	13:00-14:00	NK6	Lecture – Are we all mutants?	Lecture	JB
Fri 15 Nov	09:00-10:00	NK6	Lecture – Genomes, Pharming and more...	Lecture	JB
	15:00-18:00	ZG11	Lab 5C – Blood typing analysis	Practical	JB,ST,GM,PM
Week 17					
Mon 18 Nov	14:00-15:00	NK6	Lecture – Final lecture and course roundup	Lecture	JB,GM
Tue 19 Nov					
Wed 20 Nov					
Thu 21 Nov					
Fri 22 Nov					
Week 18 - No teaching during this week REVISION WEEK					

Staff

JB – Dr John Barrow (Course Co-ordinator)
IC – Dr Isabel Crane
AJ – Dr Alison Jack
PM – Dr Pietro Marini
GM – Prof Gordon McEwan (Course Co-ordinator)
MS – Dr Michael Scholz
DS – Dr Derryck Shewan

ST – Dr Steven Tucker

Venues

MacRob – MacRobert Building Lecture Theatre
NK6 – New King's 6 Lecture Theatre
ZG11 – Zoology Teaching Lab (ground floor)