1495 UNIVERSITY OF ABERDEEN

BM4301-The Science of Ageing-From Cradle to Grave

Course Handbook 2023-2024

School of Medicine, Medical Sciences & Nutrition

Undergraduate Medical Sciences

Contents

Course Summary

This course investigates the mechanisms of ageing and its impact on different human systems. Systems that will be investigated include the musculoskeletal, cardiovascular, renal, hepatic, brain and nervous system and cognitive function. The development and progression of common diseases such as osteoporosis, sarcopoenia, osteoarthritis, and cognitive decline that are prevalent in old age will be investigated, along with current interventions to prevent and/or treat these diseases (including exercise). Other age-related issues such as age-related psychological changes and polypharmacy will also be explored.

Course Aims & Learning Outcomes

The main learning outcomes will be:
1. Appreciation of the current ageing demographics in societies.
2. Exploration of the proposed mechanisms that underlie the ageing process in mammals based on current research evidence.
3. Understanding the impact of ageing on the cardiovascular, respiratory, renal and hepatic systems. The development and progression of associated diseases, such as aortic valve stenosis, will be investigated in detail. Current interventions to prevent and/or treat these diseases (including lifestyle changes) will be explored.
4. Comprehension of the impact of ageing on the musculoskeletal system. The development and progression of associated diseases, such as osteoarthritis, and sarcopoenia, will be investigated in detail. Current interventions to prevent and/or treat these diseases (including lifestyle changes) will be explored.
5. Understanding the impact of ageing on the brain and nervous system. The development and progression of associated diseases, such as Parkinson's, depression and cognitive impairment will be investigated in detail. Current interventions to prevent and/or treat these diseases (including lifestyle changes) will be explored.
6. Understanding of the psychological implications of the ageing process, in particular investigate the age-related change in a range of emotional skills and discuss the effects of age on memory and problem-solving
7. Appreciation of the complicated interactions between different drug treatments commonly prescribed in different populations.

Course Teaching Staff

Course Co-ordinator(s):
Professor Derek Scott (ext 7566) **d.scott@abdn.ac.uk**

Other Staff:
Prof G. Nixon (GFN), Medical Sciences
Prof L. Phillips (LHP), Psychology
Dr M. Scholz (MES), Medical Sciences
Dr V Henderson (VH), Whangarei Hospital, New Zealand – formerly NHS Grampian
Dr Derek Ball (DB), Medical Sciences
Dr Iain Rowe (IR), Medical Sciences
Prof Alison Jenkinson (AMJ), Medical Sciences

Assessments & Examinations

Students are expected to attend all timetabled classes and to complete the two laboratory sessions by the appropriate deadline. It is imperative that any reasonable explanation for not attending is made to the course organiser before the labs take place. Otherwise there will be no continuous assessment mark and the class certificate, which is required to sit the examination, may be withheld.
Continuous assessment: (30%) of the course assessment is based on 2 laboratory reports and a case study (each accounting for 10%).
Written Examination: 70% of the course assessment is based on one two hour written paper.
The degree examination for this course will be held in the April/May examination diet.

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 the medical sciences office, (medsci@abdn.ac.uk) (based in the Polwarth Building,

Foresterhill) 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
- 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 Sciences 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 half session during the summer vacation), coursework will be kept until the end of Fresher's Week, during the new academic year. After that point, unclaimed student work will be securely destroyed.

Course Reading List

Recommended textbooks

1. Coni N, Nicholl C, Webster S, Wilson KJ (2003) Lecture Notes on Geriatric Medicine 6th edition Oxford: Blackwell Publishing
2. Stanner S, Thompson R, Buttriss JL (2009) Healthy Ageing: The Role of Nutrition and Lifestyle Oxford: Wiley-Blackwell for the British Nutrition Foundation
3. Taylor AW and Johnson MJ (2008) Physiology of Exercise and Healthy Aging Human Kinetics
4. Timiras PS (2007) Physiological Basis of Aging and Geriatrics. 4th edition New York: Informa Healthcare USA, Inc.
The lecturer(s) responsible for each section of the course will also provide a separate reference list, which will enable students to follow up the latest research advancements on each one of the topics covered.

Lecture Synopsis

This course is designed to provide advanced knowledge and insight, based on current scientific research, in the issues associated with the process of ageing. Common diseases that are highly prevalent in the elderly will be investigated and lifestyle approaches that could affect those diseases will be considered.

Course introduction - Prof Derek Scott
Distribution of course material, outline of the course and general introduction

Demographics and theories of ageing - Dr Michael Scholz
Overview of the age demographics in different social and cultural contexts, links between environment, society and age distributions, changes to age distribution over the last centuries. Cultural versus biological age, introduction into theories of ageing, causes of senescence: biological and genetic theories.

Ageing and the Gastrointestinal System – Prof Derek Scott
This lecture will discuss how the gut adapts and changes throughout life. The muscular contractions, secretions, microbial flora, sensory processing and many other factors have been shown to change significantly. This lecture will explain why this may been an issue when considered the nutritional status of an individual, their vulnerability to disease/illness and how they may respond to medications.

The Ageing Kidney - Prof Derek Scott
The kidneys are major regulators of physiological function and also play a key role in the metabolism and excretion of xenobiotics such as drugs. This lecture will focus on how renal function changes from birth up until old age. We will consider why this is important and how it can influence the administration/dosage of medications. This lecture will provide a useful foundation for the lectures relating to prescribing/pharmacology later in the course.

The Ageing Liver - Prof Derek Scott
The liver is a major regulator of physiological function and also play a key role in the metabolism and excretion of xenobiotics such as drugs. This lecture will focus on how hepatic function changes from birth up until old age. We will consider why this is important and how it can influence the administration/dosage of medications. This lecture will provide a useful foundation for the lectures relating to prescribing/pharmacology later in the course.

The Ageing Neurone – Dr Iain Rowe
This lecture will review the susceptibility of neurones to damage with increasing age.

Control of urinary and GI function in early life – Prof Derek Scott
In early life, we manage to work out how to engage specific reflexes at particular times in order to propel various nutrients and waste products in, around and out of the body. This lecture will explore what mechanisms we use during childhood so that we retain continent and can excrete waste in a socially acceptable and efficient manner. This lecture will discuss some of the novel research that is being undertaken to work out which brain circuits and local physiological processes are used to regulate such everyday functions and the reasons why sometimes these mechanisms do not work, as they should.

Control of urinary function in later life – Prof Derek Scott
This second lecture will examine why loss of efficient urinary control is an issue in later life and discuss the reasons why these physiological processes do not work, as they should. The influence of physiology, drug treatments, injury and disease will be covered. Strategies to improve function in these systems and an exploration of why such research is important to healthcare providers will be covered.

Sarcopoenia - Dr Derek Ball
Sarcopoenia is the loss of muscle mass and function that occurs with normal ageing. Sarcopoenic obesity is the combination of sarcopoenia with an increased fat mass. A plethora of possible causes of sarcopoenia have been identified of which three are more prominent: a) loss of motor neurones and muscle fibres b) anabolic resistance and c) a loss of satellite cells and satellite cell dysfunction. We will explore these concepts.

Aortic Valve Stenosis - Prof Graeme Nixon
The aortic valve prevents reflux of oxygenated blood back into the heart. 25% of adults over 65 years have thickening of the aortic valve which decreases valve efficiency. This eventually develops aortic valve stenosis and loss of valve function. Valve replacement surgery is typically required. This lecture will identify the pathology and causes of aortic valve disease and additionally examine the treatments. New therapeutic options will also be explored.

Age changes in cognition - Prof Louise Phillips
Declining memory is amongst the most feared consequence of old age. In this lecture the effects of age on memory and problem-solving will be discussed, outlining the pattern of both spared and impaired cognitive skills in the course of normal ageing.

Age changes in emotion - Prof Louise Phillips

In contrast to some stereotypes, older people generally experience more positive emotions than young adults. In this lecture, the pattern of age effects on the experience and regulation of emotion will be discussed, along with age-related change in a range of emotional skills.

Biological and neurological changes during ageing - Prof Derek Scott
Normal ageing in healthy individuals is associated with structural, chemical and functional changes in the brain, as well as in other parts of the nervous system. This lecture will introduce the clinical aspects of neurological changes associated with ageing.

Disease or 'just old age': the geriatrician's perspective – Prof Derek Scott/Dr Victoria Henderson
A decline in health and well-being is frequently considered a normal part of the ageing process but many chronic diseases become more prevalent with old age. This lecture will consider the medical and social models of health, and particularly how they relate to the classification of health and disease in later life. It will cover the common geriatric syndromes of falls, confusion, immobility and incontinence, and explore how these are usually multi-factorial in aetiology, typically requiring multi-disciplinary assessment and management.

Prescribing drugs in the older patients – Prof Derek Scott/Dr Victoria Henderson
This lecture will discuss general principles of correctly identifying treatment options in older patients with several co-morbidities in different health care settings.

Polypharmacy and irrational prescribing in the older patient – Prof Derek Scott/Dr Victoria Henderson
This lecture will describe the clinical relevance of drug-related adverse effects in older patients and their impact on independence and quality of life.

Chronobiology and Ageing – Dr Iain Rowe
Alterations in responses to light and changes in circadian rhythms with age. Relationship between chronobiology and disease states and drug treatment.

Practical/Lab/Tutorial Work

Practical 1: Changes in nervous response with age (DS/IR)
Details on the practical will be provided in advance of the session on MyAberdeen and the Lt system. Students are required to submit their work on the online Lt system during the practical class.

Practical 2: Exploring age-related autonomic function changes (DS/IR)
Students are required to submit their work on the online Lt system during the practical class.

Details of both practicals will be released in advance of the classes on the Lt system so that students can preview it beforehand.

University Policies

Students are asked to make themselves familiar with the information on key education policies, available here. 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 how the University will calculate your degree outcome.

These University wide education policies should be read in conjunction with this programme and/or course handbook, in which School specific policies are detailed. These policies are effective immediately, for the 2023/24 academic year. Further information can be found on the University's Infohub webpage or by visiting the Infohub.

The information included in the institutional area for 2023-24 includes the following:

- Assessment
- Feedback
- Academic Integrity
- Absence
- Student Monitoring/ Class Certificates
- Late Submission of Work
- Student Discipline
- The co-curriculum
- Student Learning Service (SLS)
- Professional and Academic Development
- Graduate Attributes
- Email Use
- MyAberdeen
- Appeals and Complaints

Where to Find the Following Information:

C6/C7- University of Aberdeen Homepage > Students > Academic Life > Monitoring and Progress > Student Monitoriung (C6 & C7)

https://www.abdn.ac.uk/students/academic-life/student-monitoring.php#panel5179

Absences- To report absences you should use the absence reporting system tool on Student Hub. Once you have successfully completed and sent the absence form you will get an email that your absence request has been accepted. The link below can be used to log onto the Student Hub Website and from there you can record any absences you may have.

Log In - Student Hub (ahttps://www.abdn.ac.uk/studenthub/loginbdn.ac.uk)

Submitting an Appeal- University of Aberdeen Homepage > Students > Academic Life > Appeals and Complaints

https://www.abdn.ac.uk/students/academic-life/appeals-complaints-3380.php#panel2109

Academic Language & Skills support

For students whose first language is not English, the Language Centre offers support with Academic Writing and Communication Skills.

Academic Writing

- Responding to a writing task: Focusing on the question
- Organising your writing: within & between paragraphs
- Using sources to support your writing (including writing in your own words, and citing & referencing conventions)
- Using academic language
- Critical Thinking
- Proofreading & Editing

Academic Communication Skills

- Developing skills for effective communication in an academic context
- Promoting critical thinking and evaluation
- Giving opportunities to develop confidence in communicating in English
- Developing interactive competence: contributing and responding to seminar discussions
- Useful vocabulary and expressions for taking part in discussions

More information and how to book a place can be found here

Medical Sciences Common Grading Scale

Grade	Grade Point	% Mark	Category	Honours Class	Description
A1	22	90-100	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	85-89			
A3	20	80-84			
A4	19	75-79			
A5	18	70-74			
B1	17	67-69	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	64-66			
B3	15	60-63			
C1	14	57-59	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	54-56			
C3	12	50-53			
D1	11	47-49	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	44-46			
D3	9	40-43			
E1	8	37-39	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	34-36			
E3	6	30-33			
F1	5	26-29	Clear Fail	Not used for Honours	• Contains major errors or misconceptions • Poor presentation
F2	4	21-25			
F3	3	16-20			
G1	2	11-15	Clear Fail/Abysmal		• Token or no submission
G2	1	1-10			

G3	0	0			

Course Timetable BM4301: 2023-2024

Date	Time	Place	Subject	Session	Staff
Week 13					
Mon 23 Oct	1200-1300	Polwarth 2:054	Course introduction	Lecture	DS
Tue 24 Oct					
Wed 25 Oct	1200-1300	Polwarth 2:054	Demographics and theories of ageing	Lecture	MES
Thu 26 Oct	1000-1300	STH 0.004	PRACTICAL 1: EEG and Nerve Conduction	Practical	DS/IR/AMJ
Fri 27 Oct	0900-1000	BMP Workshop D2	Ageing and Gastrointestinal Function	Lecture	DS
Week 14					
Mon 30 Oct	0900-1100	BMP LT	Disease or 'just old age': the geriatrician's perspective & Prescribing drugs in the older patients	Lecture	DS
	11.00-12.00	BMP LT	Polypharmacy and irrational prescribing in the older patient	Lecture	DS
	12:00-13:00	BMP LT	Chronobiology and ageing	Lecture	IR
Tue 31 Oct					
Wed 1 Nov	1200-1300	Polwarth 2:054	The Ageing Liver	Lecture	DS
Fri 3 Nov	0900-1000	BMP Workshop D2	The Ageing Neuron	Lecture	IR
Week 15					
Mon 6 Nov	1200-1300	Polwarth 2:054	Control of urinary and GI function in early life	Lecture	DS
Tue 7 Nov					
Wed 8 Nov	1200-1300	Polwarth 2:054	Sarcopoenia	Lecture	DB
Thu 9 Nov	10:00-13:00	STH 0.004	Practical 2: Autonomic Function Testing	Practical	DS/IR/AMJ
Fri 10 Nov	0900-1000	BMP Workshop D2	Aortic Valve Stenosis	Lecture	GFN
Week 16					
Mon 13 Nov	1200-1300	Polwarth 2:054	Age changes in cognition	Lecture	LHP
Tue 14 Nov					
Wed 15 Nov	1200-1300	Polwarth 2:054	Age changes in emotion	Lecture	LHP
Thu 16 Nov					
Fri 17 Nov	0900-1000	BMP Workshop D2	The Ageing Kidney	Lecture	DS

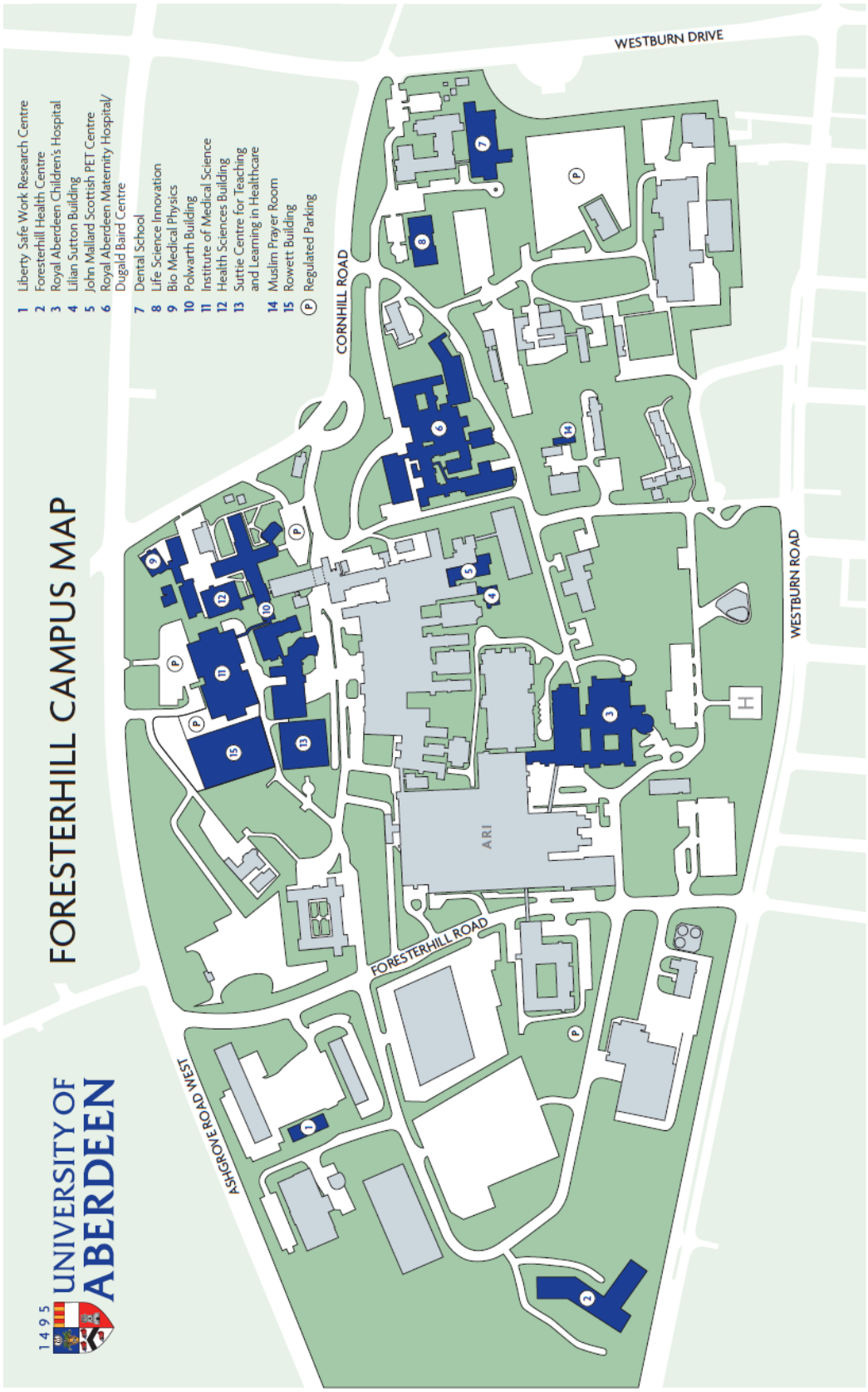
Week 17					
Mon 20 Nov	1200-1300	Polwarth 2:054	Brain Changes During Ageing	Lecture	DS
Tue 21 Nov					
Wed 22 Nov	1200-1300	Polwarth 2:054	Control of urinary function in later life	Lecture	DS
Thu 23 Nov					
Fri 24 Nov	0900-1000	BMP Workshop D2	Cognitive changes in the elderly	Lecture	DS

Staff

Prof Derek Scott (DS)
Dr Michael Scholz (MES)
Prof Graeme Nixon (GFN)
Prof Louise Phillips (LHP)
Dr Victoria Henderson (VH)
Dr Derek Ball (DB)
Dr Iain Rowe (IR)
Prof Alison Jenkinson (AMJ)

Campus Maps - Foresterhill

Floor Plans


FORESTERHILL CAMPUS MAP
1 Liberty Safe Work Research Centre
2 Foresterhill Health Centre
3 Royal Aberdeen Children's Hospital
4 Lilian Sutton Building
5 John Mallard Scottish PET Centre
6 Royal Aberdeen Maternity Hospital/ Dugald Baird Centre
7 Dental School
8 Life Science Innovation
9 Bio Medical Physics
10 Polwarth Building
11 Institute of Medical Science
12 Health Sciences Building
13 Suttie Centre for Teaching and Learning in Healthcare
14 Muslim Prayer Room
15 Rowett Building
(P) Regulated Parking
WESTBURN DRIVE
CORNHILL ROAD
WESTBURN ROAD
FORESTERHILL ROAD
ASHGROVE ROAD WEST
ARI
1495 UNIVERSITY OF ABERDEEN

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POLWARTH BUILDING

First floor

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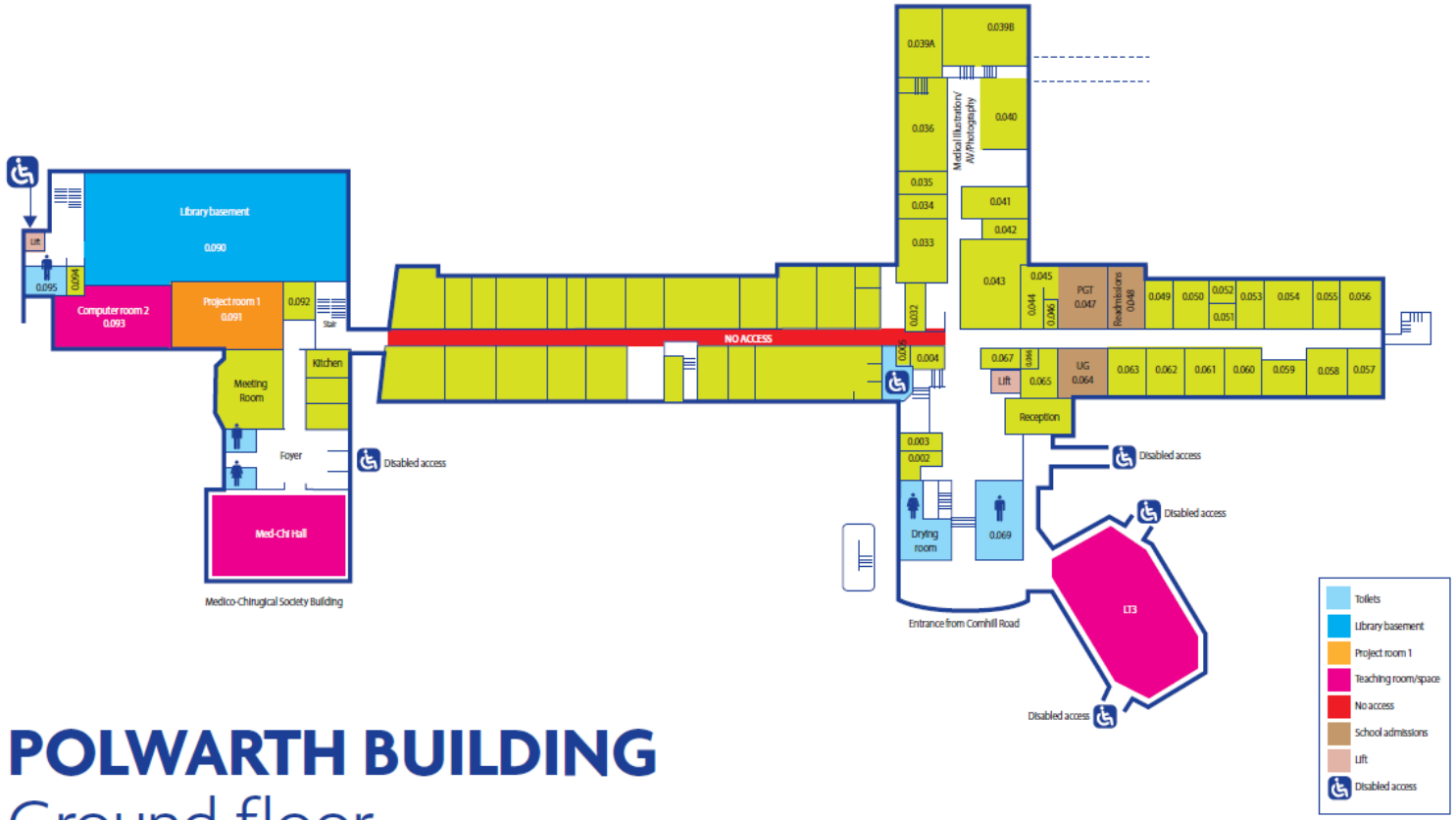

POLWARTH BUILDING
Ground floor

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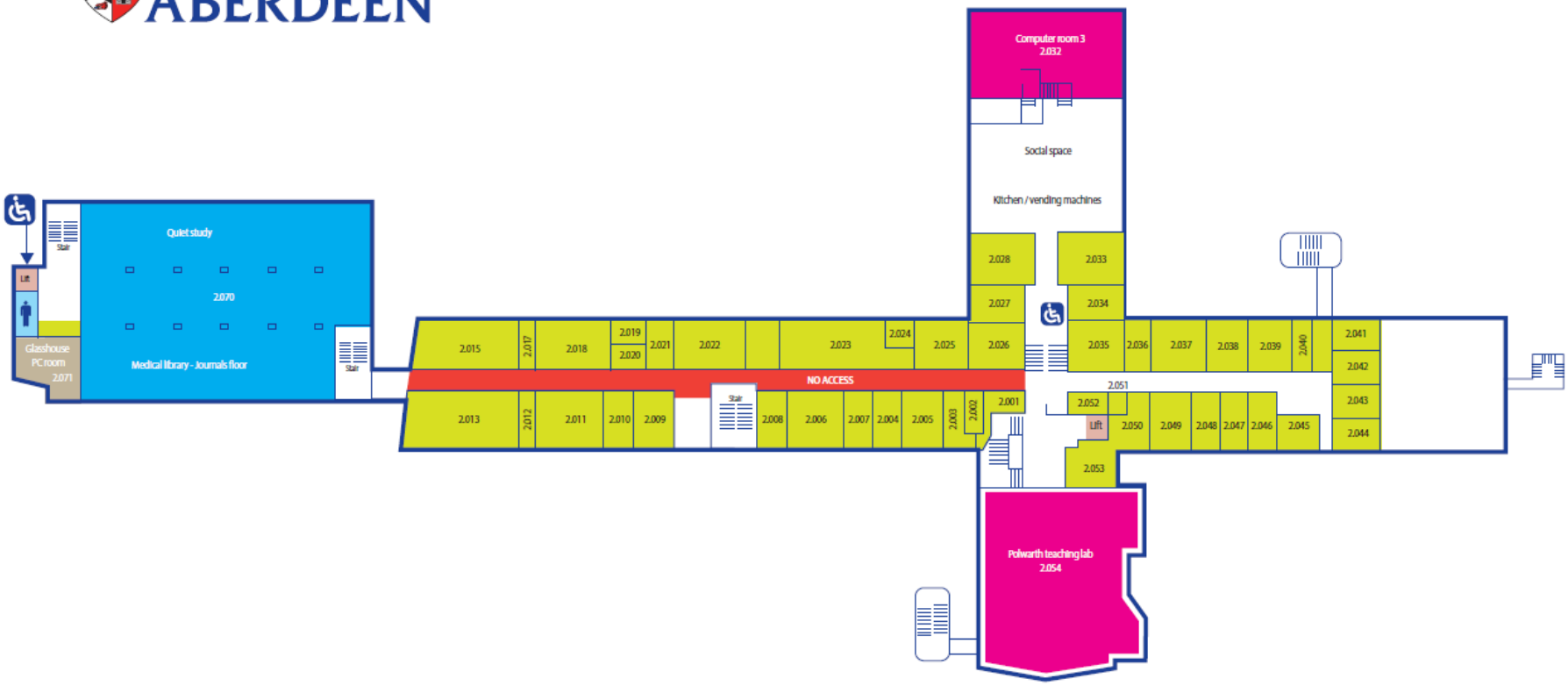

POLWARTH BUILDING
Second floor