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
Honours Immunology Option 2: Molecular Immunology

Course Summary
The aim of this course is to provide an in-depth understanding of how the immune system acts to protect us at a molecular level, and how in the future we could manipulate it to generate novel immunotherapies. Main Learning Outcomes include understanding the molecular mechanisms that allow the immune system to respond to the many challenges it faces. These include drawing out functional insights from recent studies that identify novel signalling pathways and molecular interactions affecting disease susceptibility and resistance. It also covers recent progress of how early interactions with infection through the innate immune system can shape and tailor immune responses, for example, by altering macrophage and dendritic cell activities to provide crucial information to the adaptive immune response.

Course Aims & Learning Outcomes
The subject-specific learning outcomes are such that, at the end of the course you will be able to;

- describe the human adaptive immune response and the role that inheritance genes of the immune system play in disease susceptibility; how immunological homeostasis is maintained by regulatory cells, and how immunological dysfunction can lead to disease.
- understand how specialized antigen receptors of T and B lymphocytes function to induce immunity, tolerance or disease.
- understand and describe the interaction of cells cytokines, chemokines and other immune mediators that regulate leucocyte trafficking and migration during inflammation
- describe the role of phage display technologies in elucidating immuno-genetic repertoires and understand the contribution of MHC structure to its function in T cell recognition

Course Teaching Staff
Course Co-ordinator(s):
Dr Frank Ward (f.j.ward@abdn.ac.uk)

Other Staff:
Dr Heather Wilson (h.m.wilson@abdn.ac.uk)
Dr Isabel Crane (i.j.crane@abdn.ac.uk)
Assessments & Examinations
This course is assessed via a written examination (worth 70% of the overall course grade) in the May exam diet and one piece of continuous assessment (worth 30% of the overall course grade).

The continuous assessment associated with this course is detailed below, with two other pieces of work being associated with your other “Option” course and the “Core” course.

It is vital that the deadlines for your continuous assessments are adhered to. Submit an incomplete piece of work rather than miss a deadline. Work not submitted on time will not be accepted unless accompanied by either a medical certificate or a written explanation justifying this.

A complete submission of your work consists of:

- uploading an electronic copy of the work via MyAberdeen before 12 NOON on the deadline date.

The deadlines for all three pieces of work are:

- Core course Research Perspective: 12 NOON, Monday 1st October.
- Option 1 course Research Tutorial Spotlight: 12 NOON, Monday 5th November.
- Option 2 course Essay: 12 NOON, Monday 3rd December.

Research Essay

The essay topics are given below. You should select one title from the list.

1. Immune checkpoint inhibitors such as CTLA-4 and PD-1 as immunotherapy targets for cancer.
2. Discuss molecular mechanisms that enable natural killer cells to distinguish tumours, virally infected or stressed cells from normal cells.

You are welcome to use subheadings to structure the essay as you see fit, but the following should be included on a title page.

- Title (do not modify the title from above)
- Name
- Student ID
- Word Count
Word limit for your Research Essay is **2,000 words** and you can use as many appropriate figures/tables as you wish. The word limit does not include text in tables, figure legends, or references.

**Scientific Writing**

Writing is an important scientific skill. Its function in the Honours courses is to provide you with training in finding, reading, analysing and communicating scientific ideas. Although it is usually necessary to start your reading from reviews that provide an expert overview of a topic, it is critical to your development that you read a significant number of original papers that describe the experiments underpinning key scientific advances. Central to these skills is the development of the ability to judge the important points made in a paper and what are the central pieces of evidence that support those points. Finally, it is important for all graduates to have a working knowledge of the key experimental procedures and techniques that generate the data that we use to test hypotheses.

**Word Limit:** Adhering to a word limit (excluding figure legends, tables and the reference list) requires you to be disciplined in the preparation of the piece of work; being able to write to a required length is a very useful skill, so we expect you to stay within the limit set. Your computer will give you a word count; this must be included at the end of the work submitted. **We reserve the right to return work exceeding the word count for shortening. Submissions returned for shortening must be re-submitted within 24 h.** Having to resubmit your work again will delay marking and subsequent feedback.

**Assessment:** The continuous assessment for Honours will be assessed by two members of staff, using criteria that will be published in MyAberdeen alongside the submission links for each piece of work. This assessment is not open to negotiation, although if asked, the markers will clarify any points of constructive criticism. Please use the assessment criteria as a guide and read them with care; the notes on scientific writing also give you guidance on what we judge to be important in a well-written piece of work. If you have particular doubts about your ability to write scientifically, either in terms of organising material or in the mechanics of good scientific writing, seek help from a member of staff or the Honours Coordinators during the first term. Do not wait until your first assignment is causing you anxiety.

All submissions should make reference to the latest literature on the subject you have chosen. While you may be guided through an unfamiliar subject area by reference to a review, your work should specifically not paraphrase the review article, but should be a synthesis of your own views of the subject, written in your own words arrived at by reading of the original research papers from resources such as Web of Science/Medline/PubMed/Google Scholar. This will give insight into how information is
Avoiding Plagiarism

The definition of Plagiarism is the use, without adequate acknowledgement, of the intellectual work of another person in work submitted for assessment. A student cannot be found to have committed plagiarism where it can be shown that the student has taken all reasonable care to avoid representing the work of others as his or her own.

The instruction given above to write assignments in your own words and not to copy whole sentences from articles is crucially important to avoid plagiarism.

The University views this offence extremely seriously indeed; it can have dire consequences, including the awarding of no higher than a pass degree.

Continuous assessment assignments and your thesis are all submitted as electronic copies via MyAberdeen so they can be checked for originality. The programme will detect passages of text copied from other sources, and also if sentences from various text sources were used throughout the text, both indicators of plagiarism. MyAberdeen accepts most common formats, but it is advised that you submit your work as PDF files to avoid problems with reformatting of figures and/or text during the submission process. Any evidence of copying from other sources that is detected in your final submissions will be brought to the attention of the Head of School, who will investigate and determine whether cheating has occurred and take the appropriate action.

Feedback

As for all elements of continuous assessment, you will be given feedback on the Honours classification your work has attained, with the grading on the University Common Grading Scale (CGS). Feedback is normally given within 3 weeks of submission.

Guide to Writing

Students should refer to "A Guide to Scientific Writing" by David Lindsay (Longman Cheshire) for more general guidance on writing. What follows is not a substitute for reading this book, but gives general guidance on writing and on how we assess your work.

PLANNING YOUR WRITING

Think

- What do I know already?
- Where will I find the information needed to develop my views on this issue?
- Where can I find more information?
• What are the best examples to illustrate the points that I want to make?
• How many words do I devote to each example?

Prepare

• Read a mix of reviews and use these to identify the major original scientific papers that have resulted in our current understanding of the topic.
• Read these papers and make notes on: research strategy use to analyse the problem, key experimental procedures that generate the data and critical controls that validate the data.
• Devise a set of themes and ideas for your work using the core information from above.
• Organise evidence under the theme headings: remember that arguments pro and contra are equally important.
• Select illustrations (diagrams/schemes) that reflect the themes and ideas.

Plan

• Place themes in a logical order, and have a clear, and planned, introduction and conclusion.
• Start simply and develop towards more complex arguments.
• Do not hop from one theme to another and then back again.
• Identify the links between themes as a mechanism of ensuring continuity.

Execute

• Write short sentences and keep clauses simple.
• Use appropriate tenses.
• Be consistent in the organisation of sections.
• Have diagrams in front of you when writing about them.
• Support statements with evidence, usually a citation; ensure your citation style is consistent

Complete

• Read over what you have written - can you read it out loud without stumbling?
• Have you answered the question?
• Have you done what you said you would do at the start of the assignment?
• Have you checked it carefully for typographical errors?
Assessment of Written Work

Every piece of work in your Honours year will be assessed using a standardised assessment form. The assessment forms ensure that you get useful feedback on your written work. The Continuous Assessment form covers the following criteria.

Content and Presentation

Each piece of work will be judged on content and also on style of presentation. More marks are given for the content of the work than are given for the presentation. Look at the structure of the feedback form to see what the priorities are in giving marks. However, remember also that a written piece of work must always be more than a collection of facts and ideas. Good presentation is central to clear communication.

Knowledge: It is expected that any piece of work will contain a substantial body of facts gleaned from appropriate original literature, which should be cited within the text (Citations). The length of the work and its intended audience will dictate how many facts can be given in support of a given statement.

Analysis: Students are expected to develop their analytical skills. This is most readily demonstrated by use of carefully selected examples, which should show a good understanding of the material. Remember that examples may either support or undermine an argument.

Understanding: Students are expected to display a clear grasp of fundamental concepts in the context of the work and their discipline. This is sometimes illustrated by the lack of mistakes about fundamentals of the cell and cellular processes, but it is also expected a student will develop, through their reading, an understanding of the subject area and display this by writing logically about it.

Techniques: Scientific information is derived from experimentation. It is important to understand how information is derived. For example what technique was used, how was the experiment conducted etc.

Figures: An argument can often be supported by Figures or Tables that present information more effectively than text alone. Figures and Tables should not be an add-on, but must be an integral feature of the text and must be described and discussed. A poor or inappropriate figure or table will usually detract from the work. Appropriate figures prepared by hand or using a drawing programme are preferred to reproductions of complex diagrams from other people’s work (if used, make sure you acknowledge the source).

Citations: Papers and reviews used as source material should be cited in the text. Direct quotes should be indicated by quotation marks, although their use should be kept to a minimum, and they must be referenced (see University Web page on plagiarism). Use of the Harvard style of citation is essential and a list of citations should be presented at the
end of the work (referencing of EMBO Journal articles is a good example). The reference list does not have to be included in your word count.

In the text a reference should be cited by author and date; e.g. 'Water is known to boil at 100°C (Jones and Brown, 1872; Brown et al, 1873) and freeze at...'. Not more than two authors may be cited per reference; if there are more than two authors use et al. References should be listed alphabetically according to the initial letter of the surname of the first author. Where the same authors have published more than one paper, list them in the order in which their papers appeared. If necessary use a and b, e.g. 1990a., with the authors' surnames and initials inverted.

References should include, in the following order:

authors' names; year; article or chapter title; editors (books only); journal or book title; name and address of publisher (books only); volume number and inclusive page numbers.

The name of each journal should be abbreviated according to the World List of Scientific Periodicals (see an EMBO J. paper for reference) and italicised. References should therefore be listed as follows:


**Structure**: A good piece of writing will be clearly structured by division into appropriate sections, including an introduction, which provides a clear and concise statement of the issue to be discussed, and a conclusion, which briefly sums up the issues discussed.

**Introduction**: a clear and brief introduction of the topic of the work that describes the specific areas questions or issues that the reader should focus on.

**Viewpoint**: Students should form a view on the subject about which they are writing and should be able to support their views with balanced use of appropriate examples. A balanced piece of work will consider the relative strengths of the arguments for and against a particular point of view.

**Conclusions**: this section is used to pull the main themes of the work together and to briefly state the principal outcome of the analysis that you have performed. It should leave the reader with a clear impression of what you think about the subject matter presented.
Sentence construction, spelling, grammar: Students are expected to spell correctly and to follow the basic rules of grammar. Short, clear sentences are preferable to complex, tortuous, rambling constructions. You should be able to pick up the eight clear grammatical, punctuation and spelling errors in the sentence that follows. If you can’t, then revise your grammar/spelling rules. “Its clear to the company that there commercial targetted young people of the same age as Johns friends who where clearly able to recieve it’s message.”

Organisation: A written assignment is easier to read if it is attractively set out on the page (wide margins, double spaced, font size ≥12) with a logical progression and structure.

Specific comments: This section is provided for the staff to make comments that amplify the box assessments in the top half of the form.

Note that computer failure is not accepted as a reason for late submission - it is good practice to maintain at least two copies of computer files.
## Sample Assessment/Feedback Form

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<thead>
<tr>
<th>Standard Achievement:</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td><strong>CONTENT:</strong></td>
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<td>Knowledge</td>
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<td>Clear grasp of fundamental concepts</td>
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<td>Poor grasp of fundamentals</td>
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<td>Lack of technical insight</td>
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<td>Poorly integrated with text</td>
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<td>Incoherent / out of date / confusing / format inconsistent</td>
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<td>Techniques</td>
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<td>Use appropriate tools</td>
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<td>Range of current sources used &amp; accurately cited</td>
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<td>Structure</td>
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<td>Clear, concise, focused</td>
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<td>Clear logical structure</td>
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<td>Confused order of topics</td>
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<td>Poorly defined, not always relevant to the work presented</td>
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<td>Conclusions</td>
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<td>Concise, reflecting content of the work presented</td>
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<td>PRESENTATION:</td>
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<td>Sentence construction</td>
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<td>Visually attractive, well-organised, legible</td>
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<td>Unreadable, poorly organised, illegible</td>
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<td>Figures &amp; Tables</td>
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<td>What was good and how can future work be improved</td>
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1. Excellent: hard to improve upon. 2. 3. 4. 5. Needs major improvement to reach an acceptable Honours standard.
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 g.t.a.mcewan@abdn.ac.uk)
• Adviser of studies
• Medical Sciences Disabilities Co-ordinator (Dr Derryck Shewan d.shewan@abdn.ac.uk)

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 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
This course does not have recommended textbooks as you are expected to read the primary research literature, so no specific course texts will be recommended. That said, your previous texts from third year would be useful for basic and fundamental knowledge.

Lecture Synopsis
The aim of the molecular immunology module is to focus on recent discoveries that have shaped our understanding of how the adaptive immune system (mainly comprised of B and T lymphocytes) discriminates and functions at a molecular level.

T-cells are of fundamental importance to the adaptive immune system and require interaction with polymorphic major histocompatibility molecules (MHC). The genomic organisation and molecular composition of MHC, and their significance in autoimmune disease, will be explored. T-cell mediated immunological tolerance is of great interest because it could be harnessed for therapies to suppress damaging inflammatory responses in immune-mediated disorders. We will review immunological tolerance and elaborate proposed models to explain how the immune system discriminates harmful from non-harmful challenges. CD4+ regulatory T-cells contribute to immunological tolerance, and their function and potential as therapeutic agents will be explored. Understanding immune evasion strategies at a molecular level is of prime importance especially in tumour immunology where there are clear links between tumour formation and persistence of particular microbial pathogens.

A second theme summarises the decision-making processes that permit T-cells to generate an appropriate response after antigen encounter. Naïve and memory T-cell activation, effector cell differentiation, and the molecular signalling mechanisms behind them are reviewed.
Several new lectures have also been introduced to cover a number of exciting areas of immunology: Aire is a gene that contributes to self-non-self-discrimination in thymic selection, but recent work has uncovered some unexpected roles for this molecule. Activational and inhibitory receptors act to balance immune response intensity – too weak or strong a response against a pathogen can be equally damaging.

Finally, up to 20% of emerging clinical pharmaceutical therapies are based on engineered monoclonal antibodies. The final theme in this course is to evaluate the strategies that have been successfully employed in antibody-based technology from elucidating antibody structure through to designing antibodies and antibody fragments that form a basis for new therapies.

Material for the course will be drawn from a wide range of sources and in particular, cutting edge publications will be covered in lectures.

**Practical/Lab/Tutorial Work**

This course contains one set of research tutorial sessions and you will also complete another set of corresponding research tutorial exercises in your other Option course.

The research tutorials are small group teaching exercises at which, supported by a staff member, you will discuss a specialist subject, based upon self-directed reading of the literature. Five papers have been chosen that reflect the development of a particular topic, and you must have read the five papers before attending the first research tutorial. You will be required to develop an understanding of what constitutes a key and important paper, how the information is derived (techniques and their application), the design of those experiments, an understanding of the crucial data and an appreciation of what in the field is controversial. You are also expected to read outside the prescribed five papers and such 'use of extensive original literature' (CAS marking scheme) will be taken as an indicator of a first class student.

You will thus build up a set of your own notes on the particular subject area within the research tutorial. For each tutorial, you will be divided into small groups and attend two tutorials, each of 1-2 hours. You will subsequently be examined on your knowledge and understanding of the subjects, in particular how they are studied and how given practical techniques function, what are the merits of different approaches, and in what situation their application is appropriate. In addition, your understanding of the biology described in the five papers will be tested.

**Preparation:**

The time spent with the tutors for each tutorial is very limited (3-4 hours). For this reason, it is important to 'hit the ground running' and go into the first of your two 2-hour sessions fully prepared. It is thus essential that you read the appropriate notes page(s) which follow, and
prepare by reading any supporting review recommended by the tutors, as well as the 5 papers listed. This reading of the papers should be thorough, making sure in particular you understand the rationale of the results sections, how all the techniques work that are described and how the results lead to the main conclusions of the paper. If anything is not clear, bring those questions along to the tutorial with you; if you are critical of anything in the papers, bring these discussion points along as well. Remember, the tutors are there to support your learning, not to spoon-feed you with the answers. You should therefore go to the tutorial prepared to ask questions, to think, and to contribute to the group discussion subjects suggested in the tutorial notes (below). The tutorials are spaced so as to allow time to prepare for each of the two 2 hour sessions, each of which will have a different focus and address a different set of questions.

IMMUNOLOGY RESEARCH TUTORIAL
New perspectives on T cell function
Tutor: Dr Frank Ward (mmd475@abdn.ac.uk)

Th17 T cell responses – beneficial or detrimental in cancer?

Introduction

One of the fundamental questions regarding the TH17 T cell subset is whether tumour-associated TH17 cells are functional effector T cells with any protective role against cancer. This reflects other observations, especially in mucocutaneous TH17 T cell responses, which demonstrate a clear dichotomy dependent on precise environmental cues received by naïve T cells during TH17 T cell priming. It is clear that we need to understand these subtle differences in TH17 T cell function if we are to exploit this important T cell subset in therapy.

Tutorial 1: This tutorial will examine a number of papers that provide evidence for or against TH17 T cell responses being an important component in anti-tumour immune responses. We will then decide on the overall importance of TH17 T cell anti-tumour responses. Would you develop a therapy to increase TH17 T cells in the tumour environment?

Background reviews:

Key papers:


**Tutorial 2:** T cell help has been recognised to determine antibody class and subclass, and here we will cover how the precise effects of antibodies of different isotypes can be dissected in an exemplar autoimmune disease, using modern techniques. Aim to be able to discuss the techniques used in these more recent studies and relationships between autoantibody pathogenicity and isotype. Think how these relationships might be exploited therapeutically.

**Background review:**


Key papers:


**Your Preparation for the Tutorials:**

1. It is important that you read the key papers.
2. Prepare a written summary of the key papers with bullet points on the main findings.
3. Pay attention to the rationale and objectives of the work, the methodologies used and importantly the results and their interpretation.
4. Try to identify areas of the paper which could be strengthened or followed up with additional experiments.
5. Come prepared to discuss all the papers during the tutorial.
6. Importantly, have questions ready and also be prepared to debate points and offer answers to the other students.

**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](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 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's Infohub webpage or by visiting the Infohub.

The information included in the institutional area for 2018/19 includes the following:

- Absence
- Academic Appeals & Complaints
- Assessment (Common Grading Scale)
- Codes of Practice on Student Discipline (Academic and Non-Academic)
- Class Certificates
- Exam Results
- Transcripts
- MyAberdeen
- TurnitinUK
- Feedback
- Communication
- Aberdeen Graduate Attributes
- The Co-Curriculum
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<th>Category</th>
<th>Honours Class</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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           |          |               |             |
# IM4307 Course Timetable: 2018-2019

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Place</th>
<th>Subject</th>
<th>Session</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Week 13</strong></td>
<td></td>
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</tr>
<tr>
<td>Mon 22 Oct</td>
<td>14:00-15:00</td>
<td>BMP LT</td>
<td>Introduction: MHC molecules and their association with autoimmune disease</td>
<td>Lecture</td>
<td>Dr F Ward</td>
</tr>
<tr>
<td></td>
<td>15:00-16:00</td>
<td>BMP LT</td>
<td>Ultimate control freaks - Regulatory T Cells</td>
<td>Lecture</td>
<td>Dr F Ward</td>
</tr>
<tr>
<td>Tue 23 Oct</td>
<td>11:00-12:00</td>
<td>1:143/144</td>
<td>T Cell Polarisation - tailored immunity for a broad range of pathogens</td>
<td>Lecture</td>
<td>Dr F Ward</td>
</tr>
<tr>
<td></td>
<td>12:00-13:00</td>
<td>1:143/144</td>
<td>T cell polarisation and its control by cytokine signalling</td>
<td>Lecture</td>
<td>Dr H Wilson</td>
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<td><strong>Week 14</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon 29 Oct</td>
<td>14:00-15:00</td>
<td>1:147</td>
<td>Cytokines and cytokine receptors - targets for treatment of disease</td>
<td>Lecture</td>
<td>Dr H Wilson</td>
</tr>
<tr>
<td></td>
<td>15:00-16:00</td>
<td>1:147</td>
<td>Fast track evolution in B cells? The role of activation induced cytidine deaminase (AID) in antibody function</td>
<td>Lecture</td>
<td>Dr F Ward</td>
</tr>
<tr>
<td>Tue 30 Oct</td>
<td>14:00-15:00</td>
<td>1:147</td>
<td>Aire: the identity of “Self”</td>
<td>Lecture</td>
<td>Dr F Ward</td>
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<tr>
<td></td>
<td>15:00-16:00</td>
<td>1:147</td>
<td>Regulating movement of naïve T and B cells</td>
<td>Lecture</td>
<td>Dr I Crane</td>
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<td><strong>Week 15</strong></td>
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<tr>
<td>Mon 5 Nov</td>
<td>14:00-15:00</td>
<td>1:155/156</td>
<td>Regulating recruitment of effector T cells</td>
<td>Lecture</td>
<td>Dr I Crane</td>
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<td><strong>Week 16</strong></td>
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<tr>
<td>Mon 12 Nov</td>
<td>09:00-10:00</td>
<td>1:147</td>
<td>Tutorial</td>
<td>Tutorial</td>
<td>Dr I Crane/ Dr H Wilson</td>
</tr>
<tr>
<td></td>
<td>12:00-13:00</td>
<td>1:147</td>
<td>Modulatory receptors - tutorial</td>
<td>Lecture</td>
<td>Dr F Ward</td>
</tr>
<tr>
<td>Tue 13 Nov</td>
<td>13:00-14:00</td>
<td>1:147</td>
<td>Inflammasomes and autoinflammation</td>
<td>Lecture</td>
<td>Dr P Cao</td>
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<td><strong>Week 17</strong></td>
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<tr>
<td>Mon 19 Nov</td>
<td>15:00-17:00</td>
<td>1:154</td>
<td>Immunology 2 Tutorial 1 - Th17 plasticity in cancer</td>
<td>Tutorial</td>
<td>Dr F Ward</td>
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<tr>
<td>Tue 20 Nov</td>
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<tr>
<td>Wed 21 Nov</td>
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<tr>
<td>Thu 22 Nov</td>
<td>10:00-12:00</td>
<td>1:154</td>
<td>Immunology 2 Tutorial 2 – TFH cells and antibody development</td>
<td>Tutorial</td>
<td>Dr F Ward</td>
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<tr>
<td>Fri 23 Nov</td>
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