PROGRAMME STUDY GUIDE

1st Medical Year Study Guide 2013/2014
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</tbody>
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# CONTACT DETAILS

**Interim Head of School of Medicine:**  
Prof Paul Browne ([medicine@tcd.ie](mailto:medicine@tcd.ie))  
Tel: 01 896 1476 (School of Medicine Office, TCD)

**Director of Undergraduate Teaching & Learning & Associate Professor in Medicine:**  
Dr Martina Hennessy  
Tel: 01 896 2893 (School of Medicine Office, TCD)

## Student Affairs

**Programme Manager:**  
Ms Aine Wade ([awade@tcd.ie](mailto:awade@tcd.ie))  
Tel 01 896 4439 (School of Medicine Office, TCD)

**Medical Student Coordinators:**  
- **Years 1-2:** Marie McPeak ([mcpekm@tcd.ie](mailto:mcpekm@tcd.ie))  
  Tel: 01 896 1378 (School of Medicine Office, TCD)
- **Years 3-5:** Ms Sharon Thompson ([sthomps@tcd.ie](mailto:sthomps@tcd.ie))  
  Tel: 01 896 3829 (School of Medicine Office, Tallaght Hospital)

**Executive Officers:**  
- **Years 1-2:** Ms Rowena Newman ([medadmin@tcd.ie](mailto:medadmin@tcd.ie))  
  Tel 01 896 1075 (School of Medicine Office, TCD)
- **Years 3-5:** Alison Collie ([colliea@tcd.ie](mailto:colliea@tcd.ie))  
  Tel 01 896 3772 (School of Medicine Office, Tallaght Hospital)

**International Student Advisor:**  
Ms Rita Keane ([keaneri@tcd.ie](mailto:keaneri@tcd.ie))  
Tel: 01 896 3049 (School of Medicine Office, TCD)

## Contact Details Year 1

**Year Coordinator:**  
Dr Aileen Patterson (School of Medicine Office, TCD)  
Tel: 01 896 2349, ([patteram@tcd.ie](mailto:patteram@tcd.ie))

**Biochemistry:**  
Dr Richard Porter, Dept of Biochemistry  
Tel: 01 896 1617 ([rkporter@tcd.ie](mailto:rkporter@tcd.ie))

**Anatomy:**  
Dr Paul Tierney, Dept of Anatomy  
Tel: 896 1242 ([ptierney@tcd.ie](mailto:ptierney@tcd.ie))

**Physiology:**  
Prof Veronica Campbell, Dept of Physiology  
Tel: 01 896 1192 ([vacmpbell@tcd.ie](mailto:vacmpbell@tcd.ie))

**Family Case Study:**  
Dr Aisling Ní Shúilleabháin, Dept of Public Health & Primary Care  
Tel: 01 896 3737 ([nishuia@tcd.ie](mailto:nishuia@tcd.ie))

**Behavioural Sciences:**  
Dr Kenneth O’Reilly, Dept of Psychiatry  
Tel: 01 2157400 ([oreilli5@tcd.ie@tcd.ie](mailto:oreilli5@tcd.ie@tcd.ie))

**Medical Ethics:**  
Dr Ruth Pilkington, School of Medicine ([pilkinr@tcd.ie](mailto:pilkinr@tcd.ie))

**Medical Humanities**  
Prof Orla Sheils, Professor of Molecular Pathology & Director of Medical Ethics ([osheils@tcd.ie](mailto:osheils@tcd.ie))
Mission Statement

The mission of the School of Medicine at TCD is to facilitate and provide Medical Education to the highest international standards; to train clinicians who are equipped to fulfill their professional roles in a caring, competent and patient centered manner; to produce individuals who through critical thinking and outstanding professional and ethical standards will become leaders in their field of practice.

The School aims to be a leading research-intensive institution that fosters life-long learning in its graduates in preparation for post-graduate training. It aims to integrate its educational obligations with other missions for high-quality patient care, research excellence and new knowledge generation.

The School embraces an ethos of social responsibility, accountability, public service and community involvement, and is dedicated to meeting the health care needs of the wider community by training doctors to practice medicine with integrity, and a deep understanding of the impact of psycho-social influences and inequity on health and disease.

Professional Behaviour and Fitness to Practice

The School of Medicine at Trinity College Dublin must ensure that students abide by a number of School, College and professional regulations. These regulations are cognisant of your position as a medical student and future medical practitioner. While the School strives to strike a balance between creating a collegial atmosphere and these requirements, we are bound to meet a number of legal requirements in order to ensure your degree is recognized by national and international professional accreditation bodies.

Your professional behavior must at all times be appropriate with regard to confidentiality, attendance and behaviour towards patients and colleagues. Students will be required to sign the Undergraduate Medical Student Professional Practice Agreement, a declaration of professional conduct and ‘fitness to practice’ to signify that they have read and understood the relevant guidelines and policies e.g. Confidentiality, Medical Council Ethical Guide, Attendance etc.

Medical Absences

In the case of absence due to medical reasons, a medical certificate must be submitted to the Medical Student Executive Officer in the School Office, Biomedical Science Institute as soon as possible after illness, ideally within 3 days.

If you miss an examination due to Medical Reasons, you should notify the School. You should also, in the cases of medical absences from an examination, contact your tutor should you wish to seek Permission to Defer from the Senior Lecturer.

Social Media

Students on the Medicine course should be mindful that they represent Medicine at Trinity College at all times including while engaged in social media. All rules regarding the code of conduct, professional behaviour, confidentiality and fitness to practice must be adhered to on social media and students found in breach of this may be disciplined accordingly.
Programme Structure

YEAR 1 MEDICINE

This year is designed to:

- Promote personal development and facilitate the development of skills necessary for the successful transition from secondary student to novice health care worker
- Enable students to understand the evolution of man in his environment
- Ensure a thorough and integrated knowledge of normal human structure and function and man’s relationship with society

The first medical year will comprise of the following modules accruing 60 credits in total:

Human Development, Behavioural Science and Ethics (15 credits) MD1007
Evolution and Life (10 credits) MD1006
Human Form and Function (30 credits) MD1009
Science and Humanities (5 credits) MD1008

The Subjects which contribute to these modules are: Biology, Anatomy, Biochemistry, Behavioural Science, Ethics, Physiology, Psychology, Public Health & Primary Care and Sociology.

Multiple modes of delivery of course content are used. These include lectures, small-group learning tutorials, practical classes and e-learning. This facilitates the development of a balanced and active approach to learning for all students.
## 2013/14 Academic Year Structure

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Schedule may be subject to change.
Human Development, Behavioural Sciences & Ethics MD1007

Details
ECTS Weighting 15
Semester/Term Taught All year
Contact Hours: Lectures: 29 hrs Tutorials: 10.5 hrs PBL: 10 hrs Family Visit: 3hrs

Module Co-ordinators:
Dr Aisling Ní Shúilleabháin, Dr Kenneth O’Reilly & Dr Ruth Pilkington

Learning Outcomes:
1. Describe the key developmental milestones for a new baby, in terms of nutrition, physical development and communication
2. Recognise the importance of your duty of confidentiality in establishing a professional doctor-patient relationship and an awareness of the duties and responsibilities of students of medicine
3. Explain the social determinants of health
4. Describe the basic determinants of psychological development from childhood through adolescence to adulthood and old age
5. Demonstrate an awareness of how adversity impacts on psychological development
6. Describe the factors that predict the influence of family and peer groups on individual attitudes and health behaviours
7. Demonstrate your knowledge (using core terminology) of medical ethics/bioethics as a discipline, its foundation in the philosophical tradition of ethics and its central role in medical training

Module Learning Aims:
• To give you an understanding of the concepts of normality in physical and psychological human development, based on a lifespan developmental perspective.
• To enable you to understand the development of the individual, and how this is influenced by social and environmental factors
• To introduce you to the main theories of psychological development, including learning theory, attachment theory and systems theory
• To initiate you in the study of medical ethics and help you to develop the skills to recognise and evaluate ethical concerns

Methods of Teaching & Learning:
You will be encouraged to learn actively, that is by curiosity and exploration.
• The lecture course will provide the theoretical underpinning to practical observations.
• The Behavioural Science small groups will be in the format of ‘problem based learning’, designed to promote ‘broader understanding’ or ‘deep learning’.
• The Family Case Study will give you the opportunity to work in a practical and independent way. You will establish a professional relationship with your assigned family, allowing you to obtain demographic, social, health and development information, and to observe human behaviour and family dynamics. Small group tutorials with your Family Case Study tutor will give the opportunity of discussing relevant issues pre and post visits.
• The medical ethics component initiates your study by exploring the key principles and concepts of the subject. With the use of sample cases, you will begin to develop the skill of recognizing and evaluating ethical concerns, in addition to articulating ethical arguments on more than one side of a variety of issues.
Assessment:

<table>
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<th>Assessment Details</th>
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<tr>
<td>Annual Examinations - Written Paper (2.5 hours) of which Ethics = 10%</td>
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<tr>
<td>Family Case Study tutorials, visits, and logbooks</td>
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<tr>
<td>Behavioural Science &amp; reflective diaries</td>
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<tr>
<td>Ethics Tutorials</td>
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Recommended Reading List:

Human Development

Behavioural Science

Medical Ethics


Evolution and Life MD1006

Details
ECTS Weighting 10
Semester/Term Taught All year
Contact Hours: Lectures: 56hrs  PBL tutorials 50hrs  Practicals: 16hrs

Module Co-ordinator:
Dr. Richard Porter

Lecturers
Dr. Richard Porter, Dr. Ken Mok, Dr. Tim Mantle, Dr. Paul Voorheis, Prof. Keith Tipton, Prof. Andrew Bowie, Dr. Daniela Zisterer, Dr. Jack Bloomfield, Dr. Sinead Corr, Dr. Joe Carroll. Genetics: Prof Pete. Humphries

Module Overview

Rationale and Aims
This module introduces students to the molecular basis of life, the cellular metabolism determining human physiology and the pathological consequences of biochemical dysfunction.

The purpose of the module for Junior Freshman medical students, is to develop knowledge and understanding of the molecular basis of normally functioning mammalian cells and how diseases and mutations can disrupt normal metabolism. The course has been designed to be vertically integrated with the following courses taught to medical students: clinical biochemistry, endocrinology, immunology, pharmacology, pathology, haematology and molecular medicine. The course is mandatory. Prerequisite subjects from School for getting to grips with the course are biology and/or chemistry. The lecturer is there to guide the students through the fundamentals of the course. Don’t hesitate to ask her/him questions about the course.

Learning Outcomes:
To appreciate the importance of DNA replication, transcription & translation in regulating cellular process in mammal.
To appreciate the central role played by proteins and enzymes in the functions of the mammalian cell.
To be familiar with the principle biochemical pathways that dictate metabolism in mammals, to appreciate how they are physiologically regulated and be familiar with diseases associated with their dysfunction and how drugs, targeted to these pathways, can benefit humans.
To be familiar with membrane structure(s) and how it defines mammalian cells & organelles
To be familiar with how signals for a physiological processes that arrive on the outside of the cells are translated into function inside mammalian cells
To be familiar with how the chronological development and growth of a cell is co-ordinated.
To be familiar with examples of human cells with specialized functions

Methods of Teaching & Learning:
Students experience Biochemistry through Lectures, Practical classes, Tutorials and Small Group Learning and direct interaction with staff. The course has been designed to be vertically integrated with the following courses taught to medical students: clinical biochemistry, endocrinology, immunology, pharmacology, pathology, haematology and molecular medicine.

Resources
Details of teaching materials can be accessed at the School of Biochemistry and Immunology website at the following link: http://www.tcd.ie/Biochemistry/courses/meds.php
Assessment:

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<td>Small Group Learning (SGL) Tutorials</td>
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Key Texts


Module Content

**Summary headings of lecture topics to be covered – 56 hours:**

Introduction to Cellular Biochemistry (Porter)[1]
Protein (and macromolecule) structure and function (Mok)[5]
Enzymology (Mantle)[3]
Membranes (Porter) [1]
Membrane Transporters (Porter)[1]
Cell division and cell cycle (Voorheis)[4]
Carbohydrate metabolism (Porter)[4]
Lipid metabolism (Mantle)[4]
Nitrogen metabolism (Mantle)[4]
Bioenergetics [2] (Porter)
Integration of Metabolism [1] Porter
Cholesterol and Bile salts/acids (Porter)[1]
Gene expression/replication/transcription/translation (Bowie/Zisterer)[5]
Folate/B12/anaemias [5]
Alcohol metabolism (Tipton)[2]
Inflammation (Bloomfield)[4]
Hormones and cell signalling (Voorheis)[6]
Growth factors, oncogenes and apoptosis (Corr)[3]

**Summary of Practicals (4 hours each):**

- Spectroscopy (Carroll)
- Enzyme Kinetics (Mantle)
- Subcellular fractionation (Porter)
- Oxidative Phosphorylation (Porter)

**Tutorial on Practical Biochemistry (2 hr)**
FEEDBACK
Knowledge of course work and informal feedback on course work is discussed with each student during practical biochemistry.
Feedback for those who struggled in their first semester examinations is given to individual students in the second semester.
Breakdown of results is given to all students on request
- Course co-ordinators can be contacted with any reasonable requests about the course and the examinations.

Lecture Details

Introductory lecture: (1 lecture) Dr Richard Porter
Introduction to Biochemistry and its role in medicine, summary of lecture course, practical classes in biochemistry, examination structure and format.

Proteins: (5 lectures) Dr Ken Mok
The amino acids; acid-base behaviour; classification. The peptide linkage. General properties of proteins: size, shape, classification, amino acid composition. The amino acid sequence of insulin, interspecies variants. Pro-insulin and the processing of insulin. Other post-translational modifications.
Learning Objectives:
To appreciate how peptides and proteins are formed
To discover and analyse protein structure
To appreciate the dynamics of ligand binding to proteins

Enzymes: (3 lectures) Dr Tim Mantle
Overview of the reactions catalysed by enzymes, systematic names, general aspects of catalysis, Kinetics of enzyme-catalysed reactions. Tissue distribution and functions.
One-substrate rate equations (rapid equilibrium and steady state methods), reversible inhibition mechanisms, competitive, uncompetitive, mixed inhibitors, diagnostic plots, calculation of kinetic parameters Km Vmax, and Ki.
Time-dependent irreversible inhibition, pseudo-first order kinetics, two substrate mechanisms, diagnostic plots.
Factors involved in rate-enhancement, proximity effects, “effective concentration” covalent catalysis, general acid-base catalysis, strain, chemical models.
Regulation of enzyme activity, mechanisms that involve modulating the steady state level of enzyme. Allosteric regulation.
Structure, function and mechanism of specific examples: serine protease, lactate dehydrogenase, aspartate transcarbamylase and phosphorylase.
Learning objectives:
To realize that in many instances “genes means nanomachines”
To know the fundamentals of initial rate enzyme kinetics.
To understand the behaviour of reversible enzyme inhibitors.
To understand the mechanisms by which enzyme activity is regulated in vivo.

The Composition of Membranes and Their Function in Biochemistry,
(1 lecture) Dr Porter
Summary of topics covered in Membrane lectures: What are membranes? Different types of membranes (e.g. mammalian cell plasma membranes; Organelle membranes). Components of membranes-Lipids (e.g. phospholipids and their fatty acids; cholesterol) - Membrane Proteins. Fatty acid types. Phospholipid structure. Phospholipid nomenclature. Role of cholesterol in membranes. Hydrophobicity/hydrophilicity components in membranes. Micelles. Liposomes. Lipid bilayer structure. Integral, peripheral and transmembrane membrane proteins. Hyropathy

Learning objectives:
To know the components that make up membranes.
To understand the physical nature of membranes
To be able to describe the evidence for the dynamic nature of membranes
(To describe the process of glycosylation of membrane proteins)

Membrane Transporters and Their Function in Biochemistry (1 lecture) Dr Porter
Summary of topics covered in Transporter lectures:
Learning objectives:
To know the principles of transport processes
To understand the classification of transporters
To describe examples of transport structure and mechanism
To learn examples of transporter function and physiological roles and examples of transporter dysfunction and disease

Cell Cycle – Dr Paul Voorheis (4 Lectures)
I. Cell cycle overview and cell synchrony: Components of cell reproduction, rate of cell reproduction in adult humans, generation time, sections of cell cycle: G₁, S, G₂ & M or D, cell cycle arrest - “start” / restriction point, G₀, growth during cycle, cell synchrony: natural synchrony -- sea urchin system, experimental synchrony -- selection synchrony - induced synchrony, inhibitors of DNA synthesis, amino acid deprivation, release from density-dependent growth.
II. Characteristics of early phase: G₁: variable length, absence of G₂, requirement for RNA & protein synthesis; cells with more than one nucleus, mitochondrial genome. S: Initiation, nuclear - cytoplasmic interactions, nuclear transcription expts, cytoplasm transfer expts, independence of micronuclear & mitochondrial DNA replication G₂: Chromosome condensation & construction of spindle, arrest in G₂, cell fusion expts, G₂ progress inhibited by G₁+S factor, RNA & protein synthesis requirement, protein expression restricted to G₂ M: initiation, phosphorylation of histone F₁, cell fusion expts, M-phase cytosolic factors, reversible changes in nuclear membrane & nucleolus, cell surface changes during cycle
III. Regulation of cell cycle: Dominance of cell cycle stages - cell fusion experiments, embryonic & somatic cell cycles, meiotic & mitotic divisions, role of progesterone; maturation producing factor, discovery, temporal activity, concept of the cell cycle engine & downstream events, discovery of cyclins & role of ubiquitin. genetic analysis of the cycle, purification of MPF, antibodies reveal identity of cyclin and kinase subunits, Thr/Ser & Tyr phosphorylation in MPF, tyrosine kinase & protein phosphatase activities.
IV. Membranes and organelles during mitosis and cytokinesis: The nuclear envelope & chromosomal receptors, nuclear lamina, lamin A & lamin B, homotetramers as repeating units of lamina filaments, dissolution by MPF-mediated ser phosphorylation, specific locations of lamin A & B during mitosis, re-polymerization of lamina after end of M.

Text and other reading material for Cell Cycle:

Carbohydrate Metabolism – Dr Richard Porter (4 Lectures)
Learning Objectives:
To be familiar with the biochemical steps through principle biochemical pathways of carbohydrate metabolism
To understand the control of flux through principle biochemical pathways of carbohydrate metabolism
To understand how physiological context effects the principle biochemical pathways of carbohydrate metabolism
How medical conditions can effect principle biochemical pathways of carbohydrate metabolism

Lipid Metabolism – Dr Tim Mantle (4 lectures)
Lipids (or fat) Chemical nomenclature and chemical structures of the important lipids - triglyceride, monoacylglycerol, phospholipids etc. Enzymes that metabolise phospholipids — important in signal transduction — Fatty acid nomenclature. Overview of Lipid Digestion, Absorption, Transport, Storage and Metabolism. Digestion of Dietary Lipids, bile salts Transport of newly absorbed lipids. Chylomicron formation. β-oxidation. ketone bodies. Very low density lipoprotein (VLDLs). High Density Lipoproteins (HDLs). LDL-Cholesterol. Control of Lipid Metabolism. Lipid Storage. Overview and Integration of Lipid and Carbohydrate Metabolism
Learning Objectives:
To be familiar with the biochemical steps through principle fatty acid metabolism and lipoprotein metabolism pathways in man
To understand the control of flux through principle biochemical pathways of fatty acid metabolism
To understand how physiological context effects the principle fatty acid and lipoprotein metabolism pathways
To understand the medical conditions resulting from defective lipoprotein metabolism

Cholesterol and Biles Salts Dr Richard Porter (1 lecture)
The objective in this lecture is to understand cholesterol metabolism and the biosynthethic pathways to bile salt/acid synthesis, the role of bile salts, enterohepatic circulation and how bile salts regulate cholesterol synthesis.
Learning Objectives:
To be familiar with the how cholesterol levels are controlled in humans
To be familiar with origins and role of bile salts/ acids

Bioenergetics Dr Richard Porter (2 lectures)
[N.B. detailed practical class on subject in second term]
Learning objective:
To understand how mitochondria make ATP
Bioenergetics reference:

Nitrogen Metabolism – Dr Tim Mantle (4 lectures)
Learning Objectives:
To be familiar with the biochemical steps through principle biochemical pathways of amino acid interconversion, deamination and oxidation
To understand the control of flux through principle biochemical pathways of amino acid interconversion, deamination and oxidation
To understand how physiological context effects the principle biochemical pathways of amino acid interconversion, deamination and oxidation

How medical conditions can affect the principle biochemical pathways of amino acid interconversion, deamination and oxidation

**Biochemical aspects of ethanol and alcohol-related diseases - Prof. Keith Tipton (2 lectures)**

Definitions – tolerance and dependence. Enzymes, and isoenzymes, of ethanol metabolism; individual and species variations. "Japanese flushers" and antabuse (disulfiram). Consequences of metabolic changes in terms of NADH/NAD levels and competition with other metabolic systems. Lipid and neurotransmitter alterations. Alcohol related liver disease.

Learning objectives:
To be able to describe the pathways and enzymes involved in ethanol metabolism.
To understand the ways in which metabolism of ethanol may affect the normal cellular processes.
To understand the effects of ethanol on membranes and membrane-related processes.
To appreciate the genetic and personality factors contributing to alcoholism
To be able to relate the primary and secondary effects of ethanol to alcohol-related diseases.

**Nutritional Anaemias - (5 lectures)**

Almost everybody under clinical investigation will have a full blood count (FBC). The main objective of this is to determine the presence of absence of anaemia. Should such be present a significant proportion will be due to iron deficiency. The other main cause of a nutritional anaemia will be folate or to a lesser extent, vitamin B12 deficiency. To understand this area one needs a knowledge of the underlying causes of iron deficiency (and its counterpart, iron overload or haemochomatosis). Also, it is essential to understand the causes and effects of folate deficiency and how vitamin B12 deficiency causes an identical megaloblastic anaemia are essential. This background in folate biochemically leads to an understanding of the mode of action of some of the most important anti-cancer drugs (Methotrexate, Fluorocracil) and the most important antimicobial drugs (Trimethoprim and the Sulpha drugs) all of which are anti folates and work directly or indirectly to disrupt folate metabolism.

Learning objectives
1. The role of the folate in cell division and how this results in anaemia and risk of Spina Bifida and other neural tube defects (NTDs).
2. Vitamin B12 metabolism and how when the vitamin is deficient either through diet (vegans) or more commonly, due to mal-absorption (pernicious anaemia or gastric atrophy) an anaemia and neuropathy develop. How excess folic acid prevents the diagnosis of the anaemia allowing the neuropathy to progress undiagnosed.
3. Why some of the most important anti-cancer and anti-microbial drugs have a mechanism of action that directly or indirectly inhibits folate metabolism.
4. The antifolate methotrexate is the drug of choice to treat rheumathoid arthritis. Why?
5. The dynamics of iron distribution and metabolism in the body.
6. Haemochromatosis as an example of an infrequent medium penetrance, genetic variant compared to the genetic variants involved in NTDs which are very common but of low penetrance.

Core and Optional Reading List

Two copies of each article be given to class representative and one copy will be behind the counter in the Hamilton library

Folate/Vitamin B12
4) Weir D.G., Scott J.M. "Vitamin B12; Cobalamin", Modern Nutrition in Health and Disease, Editors: Shils M.E., Olson J.A. Shike M and Ross A.C. Williams and Wilkins, Baltimore, Maryland, USA.

These last two articles can be downloaded from PubMed.

Gene Structure and Expression Course (2 lectures) - Dr Daniela Zisterer

DNA replication (1 lecture)

Summary of topics covered in Replication lecture: DNA replicated by polymerases that take instruction from templates. General features of DNA polymerases. Problems associated with replication. Synthesis of DNA at replication fork: leading strand, lagging strand (Okazaki fragments). Enzymes at the replication fork. DNA replication of E. Coli as a model system. Comparison of prokaryotic and eukaryotic replication. Regulation of replication initiation in eukaryotes. Many enzymes involved in replication as targets for anti-cancer drugs e.g. topoisomerases

Learning objectives:
- To know the general features of DNA polymerases
- To be able to describe how DNA is synthesised at the replication fork
- To understand the problems associated with DNA replication
- To be able to compare prokaryotic and eukaryotic DNA replication

Translation (protein synthesis) (1 lecture)


Recommended Texts:

Learning objectives:
- To understand how nascent RNA become mature mRNA
- To know the different RNA molecules involved in protein synthesis
- To be able to describe the process of translation
- To learn examples of therapeutic drugs that target protein synthesis

Structure of DNA (1 lecture) - PROF ANDREW BOWIE

Summary of topics covered in DNA structure lecture:
Introduction to genome complexity. Content of the human genome. Chemical structure of DNA. The double helix. The need for the cell to ‘package’ DNA. Role of histones and nucleosomes in organising DNA. Euchromatin and heterochromatin. Chromosome structure. Human chromosomes. How chromatin is re-modelled to allow proteins and enzymes to access DNA when necessary. The role and relevance of modification of histone protein tails in making DNA more accessible, for example during gene expression.

Learning objectives:
- To know the chemical components that make up DNA.
- To understand why DNA has to be tightly packaged yet also readily accessible.
- To be able to describe how DNA is packaged in a cell.
- To understand the purpose of chromatin remodelling and histone modification.
- To understand basic chromosome structure
Gene expression and transcription (2 lectures) - PROF ANDREW BOWIE

Summary of topics covered in Gene expression and transcription lectures:
Transcription by RNA Polymerase II: The formation of the pre-initiation complex, and the role of the GTFs TFIID, A, B, E, F, and H. Structure of TFIID. General features of transcription factors, and how they interact with DNA. DNA response elements allow cells to respond to signals from the extracellular environment. Example of glucocorticoid and steroid hormone receptors. Common DNA binding motifs found in transcription factors. How amino acid sequence in these motifs determines specificity for a particular DNA sequence. Activation domains.

Textbooks
Lewin's Genes X. Krebs, Goldstein and Kilpatrick (Chapters 1, 4, 20, 28).

Learning objectives:
To appreciate the importance of transcription in regulating cellular processes.
To be able to describe the DNA elements in a gene that allow initiation and regulation of transcription.
To be able to define and describe different classes of transcription factors
To be able to describe how transcription is initiated for RNA Polymerase II promoters.
To learn the different DNA-binding motifs common to transcription factors, and know how these allow specific interaction with DNA.

Biochemistry of the Inflammatory Process: - Dr Jack Bloomfield (4 lectures)
Definition of inflammation and inflammatory diseases.
Degranulation causes release of inflammatory mediators.
Treatment of inflammatory diseases. Anti-inflammatory drugs.
Psoriasis as a model of inflammatory skin disease.
Role of neutrophil in the perpetuation of chronic inflammation.
Role of leukotrienes in pathogenesis of psoriasis.
Neutral proteinases in psoriasis.
Role of prostaglandins and leukotrienes in inflammation.
Helicobacter pylori in peptic ulcer disease.
Effect of H2-receptor antagonists on peptic ulcers.
Study of prostaglandin and leukotriene production in peptic ulcer disease.
Anti-inflammatory effects of H2-receptor antagonists.

Mechanisms of hormone action: - Dr Paul Voorheis (6 lectures)
Overview: Major types of cell-cell communication, differential response of different cells to the same hormone, response time and general mechanism, amplification, termination of response, sensitisation and down-regulation, hydrophilic versus hydrophobic hormones, second messengers versus first messengers.
Receptors: Single transmembrane segment receptors, EGF & insulin receptors as examples, functional domains determined from cloning & sequencing expts., tyrosine kinase activity, self & G-protein phosphorylation, entry by receptor-mediated endocytosis, P1-glycan linkages & possible 2nd messenger activity, receptor regulation by serine/threonine phosphorylation, oncogene analogues.
Receptors: Seven-transmembrane-segment receptors, ß-adrenergic receptor as example, transmembrane disposition & charged residues, agonist-antagonist binding within transmembrane portions 2/3 & 5/6/7, G-protein coupling domain in cytoplasmic segments 5/6 & C-terminus, fatty acylation of receptor, oncogene analogues; cerb A receptors for steroid hormones & thyroid hormone, cytoplasmic & nuclear locations, nuclear translocation, cloning & sequencing, functional domains, Zn2+ -fingers, DNA binding & promotor activity, ovalbumin gene activation by progesterone & role of nuclear scaffold proteins, oncogene analogues.
**G-proteins:** Gs, Gi & Go, α/β/γ subunit structure/function, GTP-GDP binding/exchange, open & closed nucleotide binding site, transient coupling to & function of hormone-receptor complex, GTP – a subunit coupling to target protein & activation, GTP hydrolysis, decoupling & termination of signal, cholera toxin, pertussis toxin, NAD-dependent ADP-ribosylation, other G-proteins, oncogene analogues.

**Cyclic nucleotide signalling:** Discovery & structure of cAMP, adenylate cyclase catalytic reaction, cloning, sequencing & membrane disposition of cyclase, functional domains, regulation of cytoplasmic phosphorylation consensus site, structural similarity of transmembrane segments to ion channel transmembrane segments, possible bifunctional protein, cAMP-depending protein kinase, subunit structure/function, substrate specificity, summary of steps in adrenalin signalling.

**IP3, Ca2+ & Protein kinase C signalling:** Structures of D-my o-inositol & phosphatidyl inositol, location in inner leaflet of PM, PI kinase & IP-4,5-bis-phosphate, inositol-specific phospholipase C, location, functional domains derived from cloning/sequencing expts, hormone-receptor interaction, catalytic reaction & products, inositol-1,4,5-tris-phosphate binding to ER/SE Ca2+ channel, basal & stimulated cytoplasmic Ca2+ levels, Ca2+ transients, calmodulin structure & Ca2+ binding, binding/activation of target enzymes, IP3 verses IP2 & entry of external Ca2+ termination of signal by signal by OP3 degradation, Li+ sensitive phosphatase; protein kinase C, location & diglyceride activation, phorbol ester & tumour promoters, phosphorylation of G-protein (ser/thr) & other proteins, regulation of endocytosis/exocytosis, phosphorylation & mitogenesis, AP3: fos/jun, helix-turn-helix & leucine zipper DNA – binding motifs, trans-acting factors, other oncogene analogues, summary of steps in IP3/ Ca2+ & protein kinase C signalling.

**Growth Factors and Apoptosis:** - Dr. Corr (3 lectures)

Lecture 1 Growth factor signalling:
To understand how cells normally grow and divide. How growth factors were discovered and what are they? EGF, PDGF and NGF as examples. Understanding the first growth factor signal transduction pathway. Receptors as tyrosine kinases: receptor dimers and tyrosine kinase activation, recruitment of SH2 proteins, activation of Ras, Raf and the MAPK signalling cascade. Changes in gene expression and entry into the cell cycle. Scaffold proteins and inhibition of MAPK cascades.

Lecture 2 Dysregulation of growth factor signalling pathways:
Key features of cancer: dysregulated cell growth. Discovery of viral oncogenes and proto-oncogenes. Description of Ras, Raf and RTK as examples. How mutations in oncogenes can initiate a cellular transformation event. Weinberg experiments. Available therapeutics for dysregulated growth factor signalling pathways.

Lecture 3 Apoptosis:
Key early discoveries: microscopic changes during development. The nematode as a key model system. Identification of caspases as key participants. The extrinsic and intrinsic pathways which lead to apoptosis. TNF family and Fas as key activators. Role of mitochondria: cytochrome c release. Inhibitors of apoptosis. Role of apoptosis in cancer cancer.

**Prof. Pete Humphries: Basic Genetics (8 lectures)**

Basic principles: the Human genome; structure of chromosomes revealed by modern methods of analysis (facs, multicolour spectral karyotyping etc), structure of DNA, gene structure and the genetic code, the Central Dogma. Aberrations of the genetic material: types of mutation – single base, frameshift, deletion, etc to whole chromosome. How chromosomes segregate – Mendel’s Laws of segregation and independent assortment using human pedigrees (not peas).

The impact of genetic disease in medicine: congenital disease syndromes caused by chromosomal imbalance; the spectrum of mendelian disease, including examples of common autosomal dominant, recessive and X-linked conditions; definition of multifactorial inheritance with examples of common multifactorial diseases; cancer as a genetic disease,

The practical value of medical genetics: knowledge of genetics enables accurate diagnosis and genetic counseling of patients and families. The work of regional genetics advisory services, using the activities of the National Centre for Medical Genetics and the North Eastern Regional Genetics Advisory service in the UK as examples; genetically-based and novel pharmacological approaches to therapy using specific examples – gene therapy for severe combined immunodeficiency (at a price); gene therapy now in use for restoration of vision in Leber amaurosis, and more examples depending on time.
Human Form and Function MD1009

Details
ECTS Weighting 30
Semester/Term Taught All year
Contact Hours:
109 lectures
72h small group learning (SGL)
27h laboratory classes in Physiology
60h laboratory classes in Anatomy

Module Co-ordinators:
Prof Veronica Campbell and Dr Paul Tierney

Lecturers
Anatomy:
- Dr. W. Ryan (wmryan@tcd.ie)
- Dr. N. Mahony (njmahony@tcd.ie)
- Dr. P. Tierney (ptierney@tcd.ie)

Physiology:
- Professor Veronica Campbell (vacmpbell@tcd.ie)
- Professor Kumlesh Dev (devk@tcd.ie)
- Dr Neil Docherty (dochertn@tcd.ie)
- Dr Mikel Egana (eganam@tcd.ie)
- Dr Áine Kelly (aikelly@tcd.ie)
- Dr Daniel Ulrich (ulrichd@tcd.ie)
- Dr Alice Witney (awitney@tcd.ie)

Module Overview

Rationale and Aims
The aim of Human Form and Function is to provide students with a sound understanding of the human body from the structural, cellular and organ perspectives. For convenience and because of the way in which available textbooks are named, we will be referring often to these perspectives in terms of histology, anatomy and physiology but you should remember that such a distinction is quite artificial – the body operates as a whole, structure and biological function are inherently linked and disease processes that affect any structure or activity will have consequences for the entire organism. As far as is practicable, the course teachers will try to emphasise this integration of form and function as the module progresses, since understanding this principle is essential for you to develop a good grasp of clinical practice.

Learning Outcomes
On successful completion of this module the student will be able to:
- Recognise the structural characteristics of the basic mammalian cell types.
- Recognise, describe and classify bones and joints.
- Recognise and describe the blood supply and lymphatic drainage of the limbs.
- Describe the development of the pre-embryo and the limbs.
- Describe the gross and microscopic structure and function of nerves and muscles.
- Record and take accurate measurements of nerve and muscle activity.
• Recognise, describe and classify the circulating blood cells and outline their functions.
• Demonstrate competency in the methods used to obtain and handle a blood sample.
• Describe the specialized functions of endocrine glands and tissues, including mechanisms of feedback regulation.
• Define the principal actions of the classical hormones and their regulated release mechanisms.
• Recall typical normal values for physiological variables commonly used in clinical practice.
• Apply physiological and anatomical knowledge to explain the pathogenesis and natural history of common clinical disorders of the musculoskeletal, haematological and endocrine systems.
• Describe the gross and microscopic structure and function of the cardiorespiratory system.
• Record and take accurate measurements of cardiac and respiratory function and recall typical normal values for cardiorespiratory variables commonly used in clinical practice.
• Describe the development of the cardiovascular and respiratory systems and related congenital abnormalities.
• Apply physiological and anatomical knowledge to explain the pathogenesis and natural history of common clinical disorders of the cardiovascular and respiratory systems.
• Describe the gross and microscopic structure and function of the gastrointestinal and genitourinary systems.
• Recall typical normal values for gastrointestinal and genitourinary variables commonly used in clinical practice.
• Describe the development of the gastrointestinal and genitourinary systems and related congenital abnormalities.
• Apply physiological and anatomical knowledge to explain the pathogenesis and natural history of common clinical disorders of the gastrointestinal and genitourinary systems.

Methods of Teaching and Student Learning

Methods of teaching and learning include Lectures, Practical Classes and Small Group Tutorials in which all students are required to participate.

Anatomy

The anatomy course component of the Human Form & Function module is delivered through three key components, with varying levels of interaction and therefore information transfer. Lectures provide an overview of a region or topic and emphasise points of functional and clinical significance, but are the least interactive and therefore the least efficient in information transfer. To improve this, lecture notes can be downloaded from Blackboard via the College network and ideally should be studied before attending the lecture, minimising the need for taking notes, and allowing lectures to take a tutorial format. Throughout the year consultant clinicians are organised to give lectures illustrating the use to which anatomical knowledge is put in clinical practice.

The second component of delivery is the anatomy practical class, for which the class is divided into two groups, consisting of twelve tables each. Here the emphasis is on cadaveric dissection, radiology and surface anatomy, and is highly interactive due to the class being grouped into tables of eight students, with attendant Lecturers and Demonstrators to direct and advise. This is the most important component of the Anatomy module as it has high student-lead, self-directed learning potential. Practical dissection sheets, outlining the practical objectives, are available via Blackboard and may be consulted before attending the class. The first 2 hours of each practical class are spent with students dissecting donor bodies at their work stations (tables) in the Dissection Theatre (DT). The remaining hour is spent learning radiologic anatomy and surface anatomy of the region under study, or in Small Group Tutorials (SGT). The relevance of these activities to clinical practice should be obvious.
The SGTs are the third component for delivery of information and are an essential part, as they are the most interactive and therefore, the most effective method for information transfer. They are based on exactly the same principles as the Small Group Learning (SGL) module, and tables will be rostered to attend during the final hour of practicals, or on other afternoons of the week. In these, small groups of students (3-5) lead the discussion, with a lecturer/demonstrator facilitating. Areas of difficulty are addressed; students are advised on aspects of critical thinking and exam strategies and are quizzed informally on course work. SGTs are critical to round off the learning process for the student, and students are expected to actively seek them out.

Physiology
The physiology course component of the Human Form & Function module is delivered through lectures and small group teaching in practical classes. Lecture notes can be downloaded from Blackboard via the College network (http://mymodule.tcd.ie/) and ideally should be studied before attending the lecture, minimising the need for taking notes.

The class is divided into groups of two or four for physiology practical classes. Here the emphasis is on measurement of physiological variables. A Lecturer and Demonstrators are in attendance to advise students. Laboratory information sheets containing information on laboratory protocols will be available to download in advance of each practical class. It is essential that you read the information sheets dealing with each day’s experiment before you come to class.

Students will complete an assessment for each laboratory practical. Normally, marks for a physiology practical assessment will be awarded ONLY to students who have attended the practical class with their correct group. A change of group will be considered only in special circumstances e.g. illness (on production of a medical certificate) or representing the College in a recognised sport (on production of a letter from the team captain). Absence due to late arrival in, or early departure from, college is not considered an acceptable reason. Students are reminded that the laboratory classes are a compulsory component of the module.

Small Group Learning Tutorials (note these will be explained further in the SGL blockbooks)
The overall aim of the small group learning tutorials is to promote self-directed and cooperative learning. This allows the exploration and integration of the knowledge presented in the lecture series in the Human Form & Function and Evolution & Life modules. There is an increased emphasis in medical education in developing key skills that will enable you as a graduate to handle the enormous advances made in health care every year.

On successful completion of the tutorials you should be able to:
• gain, assess, apply and integrate new knowledge
• communicate effectively at individual, group and community level with respect to the issues related to medical practice
• demonstrate effective team-working and leadership skills
• reflect on your practice and be proficient in realistic self assessment
• identify your own learning needs
• use different techniques to record, organise and present information
• manage your own time and that of others
Assessment

This module will be assessed through a combination of written examinations, physiology laboratory practical reports, anatomy practical & mid-term assessment and small group learning. Students must achieve an overall aggregate mark of at least 50% in order to pass the module. Assessments will be held in December 2013 and another in April 2014. Students achieving an aggregate mark of between 45% and 49% will be invited to a Pass/Fail viva voce examination with the external examiner(s) of the Human Form & Function module. The viva voce examinations will take place during the annual examination period in May 2014.

NB. To reflect the relevance of both Anatomy and Physiology to the clinical disciplines in subsequent years of the medical curriculum, if a student obtains less than 40% in either Anatomy or Physiology, yet achieves an overall aggregate mark of 50% or higher in the overall module, then the result will be considered as a QUALIFIED FAIL (i.e. the student will be deemed to have FAILED the module).

The structure of the assessment is:

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<tr>
<th>Percentage</th>
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<tr>
<td>70</td>
<td>Written paper</td>
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<td>5</td>
<td>Mid-term anatomy assessment</td>
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<td>Anatomy practical assessment</td>
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<td>3%</td>
<td>Physiology lab practicals</td>
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<td>4%</td>
<td>Small Group Learning</td>
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<td>TOTAL = 100%</td>
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SGL will be assessed by an essay in Term 1 and by a short answer question in Term 2 (included in the written paper alongside the Anatomy and Physiology SAQs, as a result there will be 10 SAQs in Term 2 written paper).

Anatomy practical examination

In the 5-8 station-based Practical Examination; students are asked to identify anatomical structures in dissection room specimens and answer functional and clinical questions; at either 1 or 2 of the stations this will involve a viva voce (one-to-one interview) with a member of Staff of the Department. All stations carry an equal mark.

The assessments for each term are weighted as follows:

Term 1 – 40% of module
Assessment includes written examination (December 2013); continuous assessment of Physiology practicals; Anatomy practical; Anatomy mid-term assessment and SGL mark (essay).

Term 2 – 60% of module
Assessment includes written examination (May 2014); continuous assessment of Physiology laboratory practicals; Anatomy practical; Anatomy mid-term assessment and SGL mark (short answer question in May written examination).

Supplemental examination

The supplemental examination papers will have the same format as the annual papers, with three exceptions. Firstly, there are no SGL questions in the supplemental examinations. Secondly, marks for the Anatomy mid-term assessment and Physiology lab assessment will not be carried forward. Thirdly, the Anatomy supplemental practical examination will take the form of a viva voce exam (one-to-one interview) with a member of staff of the Department.
Students must achieve an overall mark of at least 50% in the supplemental assessment in order to pass the module. Students achieving an aggregate mark of between 45% - <50% in the supplemental assessment will be invited to a pass/fail viva voce examination with the external examiner(s) to the Human Form & Function module. For students re-sitting exams in both Term 1 and Term 2 material, the weighting between the two is 50:50.

Key Texts
Anatomy
The three recommended textbooks are listed below. Last is more accurate but poor on visuals. Gray’s and Moore are excellent on visuals and clinical explanations, but often their information is not accurate. However, all three may offer valuable additional insights and will take your knowledge to a higher level. Have a look before you buy, as different styles suit different personalities. A core textbook in anatomy is not essential, at least not to begin with, as the emphasise will be on recognition of gross anatomy in the practical classes. The lecture notes where available on Blackboard are accurate and up to date, with embedded Web links, YouTube clips, and clinical explanations where appropriate.

An atlas of anatomy is absolutely essential. There are four popular atlases listed below, each with its strong and weak points. The department provides copies of all four in the Dissecting Room. Look at each before buying one. It is essential that students should form study groups; therefore it would be good if individual students in a study group obtained different atlases so that the group would have access to all.

An book on neuroanatomy is absolutely essential in Second Year and is desirable in First Year. Crossman and Neary is an excellent core text. FitzGerald and Folan is more advanced but is one you will keep through your clinical years.

An atlas on imaging (Radiology) is very useful, but not necessary to buy unless going cheap. Reference books and Wikipedia are useful in three main ways. Firstly books are helpful when your main textbook seems inadequate or unclear. Next, they are useful in learning how to systematically describe any structure. Finally, the introductory chapters to each system give an overview not provided in general textbooks. It is unnecessary to buy a reference book, as there are copies in the library. Wikipedia is a superb resource for the most up to date information, and is reliable in the Biomedical field. One drawback to it is that because it has so many contributors, it is hard for students to interpret. This is where the lecturer comes in useful.

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<thead>
<tr>
<th>Main Textbooks</th>
<th>Anatomy – Regional and Applied: Last: Churchill Livingstone</th>
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<tr>
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<td>Gray's Anatomy for Students: Drake et al: Elsevier</td>
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<td>Clinically Oriented Anatomy: Moore &amp; Dalley: Williams &amp; Wilkins</td>
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<tr>
<td>Atlases</td>
<td>Atlas of Human Anatomy: Netter: CIBA-Geigy</td>
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<td>Clinical Neuroanatomy,: FitzGerald and Folan: W B Saunders</td>
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<td>Reference</td>
<td>Gray's Anatomy: Williams et al: Longman (Big Gray's)</td>
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<td></td>
<td>Principles of Neural Science: Kandel and Schwartz [Ed]:Elsevier</td>
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Physiology
The core text for the course is


All students are advised to own or at least to have regular guaranteed access to a copy of this book. It is strongly recommended that you take time to read the relevant chapter in Sherwood before the beginning of the lecture sequence dealing with a particular body system. This is important because it will help to
familiarize you with the terminology and basic concepts that will be expanded by the lecturer. If you understood everything in Sherwood, then you would be sure of a good performance in the examination. However, few reference sources are perfect and lecturers will often provide additional information drawn from research papers or other textbooks. This emphasizes the importance of student attendance at all lectures. The majority of slides, however, will be taken from Sherwood.

Another good text is


For more information on clinical aspects of the subject, you can consult one of the following, which will also be referred to specifically in some parts of the lecture course


Kumar & Clark’s Clinical Medicine is the recommended textbook for Clinical Medicine, so you will need to have this book in future years and may wish to purchase it in advance.

The course starts with a sequence of lectures on basic tissue structure (ie histology). A manual to accompany these lectures can be downloaded from the departmental website (http://www.tcd.ie/Physiology/text/software/download.html). There is no need to buy a textbook, but a number of useful books are available in the Hamilton Library. The recommended textbook is:


Also highly rated is: Junqueira, LS & Carneiro, J (2003). Basic Histology: Text & Atlas. London: Lange 10th ed, [with CD-ROM]. Any other books less than ten years old and with good colour plates in the Hamilton Library at 611.018 are useful alternatives.

Summary
You must get an atlas of anatomy and should get a main textbook (for home use).
You should probably get a book on Neuroanatomy for next year.
You must have access to a Physiology textbook, preferably ‘Human Physiology from Cells to Systems’ by Sherwood.
Week 1
ANATOMY
At the end of this week, you should be able to:
- explain basic terminology concerning anatomical relations and movement
- describe the bones of the upper limb, basic features and how they join
- explain the general anatomy of joints and their classification
- describe the surface anatomy and radiologic anatomy of these bones

PHYSIOLOGY
- relate images of histological preparations to living tissues
- describe the main characteristics of epithelial tissues, and connective tissue
- describe the components of skin

Week 2
ANATOMY
At the end of this week, you should be able to:
- describe the attachments, actions and nerve supply of the muscles of the pectoral and scapular regions, and their effect on the shoulder joint
- define the axilla, describe its contents and explain injuries to these structures
- define the anatomy of the breast & its clinical significance
- describe sternoclavicular and acromioclavicular joints, their function and injury

PHYSIOLOGY
- outline the processes involved in bone formation and repair
- define the main body water compartments and be able to describe the movement of water between them
- define osmotic pressure, oncotic pressure and osmolality
- define oedema and understand the basic processes by which this can occur

Week 3
ANATOMY
At the end of this week, you should be able to:
- define the muscles of the shoulder & arm, their attachments and nerve supply
- explain the actions of these muscles on the shoulder & elbow joints
- classify the shoulder joint, demonstrate its movements and explain its injuries
- define the cubital fossa, identify its contents and its clinical usefulness
- classify the elbow joint and the joints of pronation and supination
- demonstrate the forearm muscles & movements of the above joints

PHYSIOLOGY
- describe the basic organization of the brain and spinal cord
• list typical normal concentrations of sodium, potassium, calcium, bicarbonate and chloride in intracellular and extracellular fluids
• explain the structural characteristics of neurons and how these relate to their function
• describe the ionic basis for the resting membrane potential and the role of energy in its maintenance
• describe the ionic changes that underlie local (electrotonic) and propagated depolarizations of an excitable cell membrane
• describe the ‘all-or-none’ phenomenon of the action potential
• explain the roles of myelin and axon diameter in determining axonal conduction velocity

Week 4
ANATOMY
At the end of this week, you should be able to:
• explain the attachments of the forearm muscles in the hand & their actions
• describe the surface anatomy of the wrist and hand
• explain the major injuries occurring to nerves and vessels at the wrist

PHYSIOLOGY
• describe the processes involved in chemical neurotransmission
• explain the processes by which sensory information is detected and processed
• describe the roles of spinal cord, hindbrain, thalamus and cerebral cortex in processing somatosensory information

Week 5
ANATOMY
At the end of this week, you should be able to:
• define the intrinsic muscles of the hand, their function and nerve supply
• classify the joints of the hand and wrist & their functional significance
• demonstrate the movements of these joints
• trace major nerves along the upper limb and explain their functions
• explain how they suffer trauma and how to test them
• describe all the blood vessels of the upper limb

PHYSIOLOGY
• explain the roles of the iris, lens and retina in vision
• explain the cellular basis of colour vision
• describe the brain pathways that carry visual information and how these affect the image that is detected
• describe the functional anatomy of the ear in relation to audition
• describe the functional anatomy of the vestibular system
• describe how the semicircular canals and macula enable control of balance and posture

Week 6
ANATOMY
At the end of this week, you should be able to:
• Mid-Term Assessment of the dissection of the upper limb
• each table will be assessed on the quality of its dissection
• each student will be assessed on their knowledge of their tables dissection
• marks awarded for this assessment represent 5% of the total mark for HFF
• this examination will replace the Anatomy Spot examinations that have taken place in previous years
PHYSIOLOGY
- discuss the distinctions between the somatic and autonomic nervous systems
- define the main differences between sympathetic and parasympathetic components of the autonomic nervous system and to appreciate their overall functional roles
- describe the 3-dimensional structure of a skeletal (somatic) muscle cell
- understand the functional organization of the sarcomere and how it contracts
- appreciate the main differences between transmission at the skeletal neuromuscular junction and at other chemical synapses
- appreciate the vulnerability of neuromuscular transmission to poisons

Week 7
ANATOMY
At the end of this week, you should be able to:
- describe all of the bones of the lower limb, side them, put them together and consider their movements
- classify the hip joint and gain an overview of the sacro-iliac joint and pubic symphysis
- explain the movements and surface anatomy of the hip joint
- define the muscles of the anterior thigh, and their actions on the knee

PHYSIOLOGY
- describe the factors which affect the amount of muscle tension that results from muscle activation under different circumstances
- discuss the differences in structure and function between skeletal, cardiac and smooth muscles.
- define a reflex
- describe the circuitry and functional importance of the tendon jerk reflex and the withdrawal (crossed-extensor) reflex
- describe how the brain has control over even simple reflexes

Week 8
ANATOMY
At the end of this week, you should be able to:
- define the muscles of the gluteal region, their attachments and nerve supply
- explain the actions of these muscles on the hip joint
- to identify the muscles hamstring region of the thigh, their attachments and nerve supply
- explain the actions of these muscles on the knee joint
- demonstrate the movements of the knee joint
- describe the surface anatomy of the knee

PHYSIOLOGY
- describe the basic composition of plasma
- list typical values for red blood cell size, circulating numbers and turnover rate
- describe the basic processes involved in blood cell formation (haemopoiesis) and the sites at which red blood cell formation and breakdown occur
- recognize the different types of white blood cell (leucocyte) and list their functions

Week 9
ANATOMY
At the end of this week, you should be able to:
- describe the muscles of the leg, their attachments in the foot and nerve supply
- explain the actions of these muscles on the ankle and subtalar joints
• demonstrate the movements of these joints
• describe the surface anatomy of the ankle and foot

PHYSIOLOGY
• classify endocrine hormones and hormone receptors
• list the pituitary and hypothalamic hormones and their peripheral effects
• describe the hormones involved in control of growth and associated diseases
• describe thyroid hormones and their role in disease

Week 10

ANATOMY
At the end of this week, you should be able to:
• trace all the nerves of the lower limb and explain their functions
• explain how they get injured and how to test their function
• trace all the blood vessels of the lower limb
• explain the clinical importance of some of these vessels

PHYSIOLOGY
• describe the adrenal and gonadal steroid hormones and their role in disease
• describe the hypothalamo-pituitary axis and its role in stress
• describe how hormones control glucose levels and associated illnesses
• discuss principles of hormonal regulation of calcium balance
• describe the major role of the pineal gland in endocrine regulation

Week 11 – Reading week

Week 12 – Examinations
**Week 1**

**ANATOMY**

At the end of this week, you should be able to:

- describe the thoracic wall including its ribs, vertebrae, and sternum
- define how the thoracic wall moves; its muscles, joints and nerves.
- explain the structure of the diaphragm and the mechanics of respiratory movements.

**PHYSIOLOGY**

- describe the overall organization of the respiratory tract
- recognize the notations used to identify different respiratory parameters
- define TLC, FRC, RV, VC, TV and FEV
- appreciate the absolute pressure gradients involved in respiratory air movements and how these relate to flow rate during inspiration and expiration
- discuss the concepts of anatomical and physiological dead spaces
- describe the mechanisms that normal regulate airways resistance
- describe cellular processes that underlie development of asthma

**Week 2**

**ANATOMY**

At the end of this week, you should be able to:

- define the chest plate and the lungs
- describe the major features of the lungs, side them and understand their function
- define the bronchopulmonary segments and their significance to clinical medicine
- describe the structures of the superior and anterior mediastina.

**PHYSIOLOGY**

- explain the major reasons for ventilation/perfusion mismatching
- list the percentage composition and partial pressures of O₂, CO₂, H₂O and N₂ in atmospheric and alveolar air and understand the factors that can make these values vary
- describe why pressures in the pulmonary circulation are less than those in the systemic circulation and recognise the functional consequences
- discuss the non-respiratory importance of the lungs
- explain why pneumonia and pulmonary oedema prejudice respiratory function
- define obstructive and restrictive lung disease and be able to predict how each of these types of disease will affect respiratory mechanics and gas exchange
- describe the different functional roles of dissolved and haemoglobin-bound oxygen and know their absolute normal values in arterial and venous blood
- discuss how the relationship of plasma oxygen concentration to blood oxygen content is altered by variations in haematocrit and by haemoglobin binding capacity

**Week 3**

**ANATOMY**

At the end of this week, you should be able to:

- remove the heart, place it in the anatomical position, define its chambers and major blood vessels
- trace its coronary arteries and understand their significance in disease
• describe its internal features, and describe its conduction system and understand the consequences of its dysfunction

PHYSIOLOGY
• appreciate the principles of respiratory control and the implications of changed oxygen and carbon dioxide concentrations
• appreciate the consequences of ambient pressure on gas exchange and handling by the body
• describe the absolute pressure changes experienced as one ascends to high altitude
• discuss the acute and chronic effects of breathing a hypoxic gas mixture
• define the rate at which absolute atmospheric pressure increases with descent below the surface level of water
• discuss the diverse effects of hyperbaric environments on the body

Week 4
ANATOMY
At the end of this week, you should be able to:
• recognise and describe the structures of the posterior mediastinum; oesophagus, aorta and azgos veins
• explain the sites of passage of these major structures through the diaphragm
• define the function of the diaphragm, and its relation to these structures

PHYSIOLOGY
• describe the organisation of the cardiovascular system
• discuss the main factors that affect resistance to and velocity of fluid flow in the bloodstream and be able to relate these factors, using equations
• describe the structural properties of arteries, arterioles, capillaries, veins and lymphatics and how these relate to the specialized functions of these vessels
• discuss the absolute effect of gravity on intravascular hydrostatic pressures in the vasculature of the lower limbs when standing
• describe how gravity affects venous return and water movement between plasma and interstitium
• describe the electrical properties of the heart and the principle of the ECG

Week 5
ANATOMY
At the end of this week, you should be able to:
• expose the abdominal cavity and identify the layers of the anterior abdominal wall.
• describe the inguinal canal, the course of the spermatic cord and understand the anatomy of inguinal hernias
• remove the liver and spleen, identify their major parts and review the pathology affecting them
• free up the stomach from the greater omentum and identify parts of the proximal GI tract

PHYSIOLOGY
• define cardiac output, cardiac index, preload and afterload
• list typical values for the distribution of cardiac output at rest
• explain the principle of auscultatory measurement of blood pressure

Week 6
ANATOMY
At the end of this week, you should be able to:
• uncover and dissect out both kidneys and understand their coverings
• free the GIT from the posterior abdominal wall, and trace its parts from stomach to rectum
• describe the pancreas and understand its relations, especially to the extrahepatic biliary system
• define the major vessels and muscles of the posterior abdominal wall

**PHYSIOLOGY**
• recognize typical normal values for systolic and diastolic arterial pressures and appreciate how each of these is affected by heart rate, cardiac contractility, aortic compliance and peripheral resistance
• recognize the importance of a stable arterial blood pressure and understand the main processes by which blood pressure is regulated
• discuss the independent regulation of total peripheral resistance and specific regional resistances
• describe the processes by which local regulation of regional blood flow can occur

**Week 7**

**READING WEEK**

**Week 8**

**ANATOMY**
At the end of this week, you should be able to:
• describe the arterial supply, venous drainage, lymphatic drainage and nerve supply of the entire GI tract
• explain the common pathology affecting the GI tract and its treatment

**PHYSIOLOGY**
• describe the functional architecture of the gastrointestinal tract (g.i.t.)
• appreciate the interactions of hormonal and neural factors in regulation of digestive function
• describe the basis of g.i.t. motility
• describe which segments of the g.i.t. depend on somatic muscle and which on smooth muscle
• explain the roles of the salivary glands and stomach in processing of ingested food
• explain the mechanisms that underlie ulceration of the wall of stomach or duodenum
• describe the processes by which carbohydrates, proteins and lipids are digested and absorbed
• define the volume of water normally entering the large intestine daily and to understand how this water is handled
• describe the regional specialization of absorptive function in the G.I.T. and the consequences for surgical resection of different areas
• describe the common causes of overt malabsorption syndromes of nutrients or water
• explain the basis of diarrhoea and the different ways in which this might be triggered
• appreciate the different causes of insulin-dependent and insulin-independent diabetes

**Week 9**

**ANATOMY**
At the end of this week, you should be able to:

* **Mid-Term Assessment** of the dissection of the thorax and abdomen
  * Each student will be assessed on their knowledge of their tables dissection
  * Marks awarded for this assessment will represent 5% of the total mark for HFF
  * This examination replaces the Anatomy Spot examinations of previous years

**PHYSIOLOGY**
• describe the roles of the biliary system in lipid absorption
• explain the roles of the liver in nutrient processing
• describe the wide range of other functions fulfilled by the liver
• describe the wide range of abnormalities that are consequently associated with liver damage
• explain the unique circulatory supply of the liver and the functional consequences of this
• define jaundice, describe the three ways in which it may occur and explain how these may be distinguished
Week 10
ANATOMY
At the end of this week, you should be able to:
• define the major pelvic organs from the sagittally sectioned donor pelvises
• define the bony pelvis, and explain the attachments of the pelvic diaphragm to it

PHYSIOLOGY
• describe the functional architecture of the kidney and its blood supply
• define typical normal values for renal plasma flow, glomerular filtration rate and urine production
• describe the forces involved in filtration, secretion and reabsorption and appreciate the roles of passive and active mechanisms in creating these forces
• discuss the principles employed for evaluation of the adequacy of renal function
• describe the general handling of filtered solutes by the kidney
• describe in detail the processes by which sodium and potassium are handled in the nephron

Week 11
ANATOMY
At the end of this week, you should be able to:
• describe the parts of these major pelvic organs and explain attachments to the lateral pelvic wall
• describe the arterial supply, venous drainage, lymphatic drainage and nerve supply of these major pelvic organs
• These vascular and nervous structures will not be dissected

PHYSIOLOGY
• describe the mechanisms by which osmolality of the tubular filtrate is altered in different segments of the nephron
• discuss the renal processes that maintain water balance
• define the absolute limits to urinary osmolality and volume
• describe how urine is handled in the post-rerenal urinary tract
• describe the renal processes that maintain acid-base balance
• appreciate the interaction of renal and respiratory systems in acid-base regulation
• explain how prerenal, renal and postrenal factors can cause failure of effective renal function

Week 12
ANATOMY
At the end of this week, you should be able to:
• describe the position, relations and support of pelvic organs
• explain the normal function, dysfunction and pathology of these major pelvic organs
• The perineum will not be dissected, due to its difficulty

PHYSIOLOGY
• describe the roles of gonadal hormones in prenatal sexual development
• discuss the importance of adrenal androgens in female development
• predict the consequences of foetal deprivation of testosterone, dihydrotestosterone or dihydroepiandrosterone
• recognise the major differences between germ cell maturation in males and females
• describe the roles of gonadal hormones in postnatal sexual development
• explain the hormonal control of spermatogenesis
• describe the organization of the male and female reproductive tracts
• outline the functional significance of the different components of semen
• describe the sequence of hormonal changes that occurs during the menstrual cycle and its functional consequences
• describe the processes that occur between fertilisation and implantation of the conceptus
• explain the functional organisation of the placenta and appreciate its roles
• describe the hormonal changes that occur during pregnancy and how these contribute to maternal and foetal functions
• list and describe the main maternal adaptations to pregnancy
• discuss the events important in the initiation and regulation of the progress of labour (parturition)
• describe the processes that are involved in the growth and function of the mammary glands

**Week 13**

**ANATOMY**
The perineum will not be dissected, due to its difficulty
However, at the end of this week, students should be able to:
• Describe the position, relations and support of anal canal, testes and urethra
• Explain the normal function, dysfunction and pathology of these important perineal organs

**Week 14 – REVISION**

**Week 15 - EXAMINATIONS**

**Resources**
The new Dissection Room (DR) in the Biomedical Sciences Institute, Pearse Street.
Equipped to operating theatre standard, with a nonpareil Audiovisual system
(Open from 09:00a hrs until 17:00 hrs Monday-Friday, to all students).
A full program of dissection of donor bodies.
A selection of bones, both real and plastic models, covering every area of the body.
An extensive collection of models of organs and regions of the body, for promoting greater understanding of the internal organisation of the body.
A full collection of up-to-date lecture notes, available on password protected college run Blackboard
A selection of Atlases, and a partial selection of textbooks covering all regions of the body.
A selection of proprietary DVDs on dissections of various regions of unembalmed human bodies.
A selection of radiological, CT scan and Wiegert section resources will be available on the AV system installed in the DR, for access by students, at their work stations
The new Physiology teaching laboratory in the Biomedical Sciences Institute, Pearse Street, open during class times for specific groups only. Fully equipped with the latest equipment to measure physiological variables.
Access to academic staff during practicals, and by email outside formal teaching hours
Science and Humanities MD1008

Details
ECTS Weighting 5
Semester/Term Taught All year
Contact Hours: 20

Module Co-ordinators:
Prof Orla Sheils, Dr Aileen Patterson

Module Learning Aims:
The use of student selected modules and the application of the Medical Humanities was recommended in the GMC Tomorrow's Doctors. Since then, increasing attention has been given to the inclusion of the Arts and Humanities into the medical education framework. It is intended that this will act as a complimentary strand to the scientific approach in achieving the outcome of a humane doctor. Jane Mac Naughton describes the humane doctor 'as a doctor with understanding, assisted by interpretive ability and insight, governed by ethical sensibility, (and able) to apply this scientific evidence and skills to the individual patient'.
The aim of the module is to provide you with an opportunity to reflect on medical practice through the study of the philosophy of scientific thinking and medical humanities.

Module Content:
The module involves a choice of medical humanities electives in areas such as philosophy, art, literature, history, film and ethics. These provide a different yet complimentary view of the human condition. The modules are aimed at novice level. The climate fostered will be one where ideas can be exchanged and challenged in a safe, non-threatening environment. The learning outcomes for each module, delivery methods and assessment requirements for each are published in a separate handout.

Learning Outcomes:
1. To encourage insight into, and concern for, different aspects of the human condition
2. to recognise the role of medicine to enable individuals to participate fully in life unhampered as far as possible by illness or disability
3. to develop the students' ability to listen, interpret and communicate'
4. to develop the analytical skills and the ability to present ideas and construct arguments'
5. to promote an appreciation of the convergence between medicine and the humanities

Methods of Teaching & Learning:
The module is student centred, where small group learning is encouraged and the numbers per group are limited. Various teaching methods will be used; including a mixture of lectures, small group tutorials, workshops, seminars and e-learning formats. The educational philosophy is to make the elective components interactive and to encourage student engagement regardless of the teaching method employed.

Assessment:
The module will be assessed through a combination of Written Reflection, Group Poster and SSM specific assessment

Recommended Reading List:
Will be provided for each SSM
DISTINCTIONS

First Medical Year

Distinction in Physiology
Students achieving an overall mark of 75% or more in the physiology component of both Human Form & Function modules will be eligible for a Distinction in Physiology, subject to a successful viva voce examination with the external examiner.

Second Medical Year

Distinction in Anatomy
Students achieving an overall mark of 75% in anatomy, calculated as the average of the marks of the first and second medical years, will be eligible for a Distinction in Anatomy, subject to a successful viva voce examination with the external examiner.

Distinction in Biochemistry
Students achieving an overall mark of 75% in Biochemistry, calculated as two-thirds of the marks of the first medical year plus one-third of those of the second medical year, will be eligible for a Distinction in Biochemistry, subject to a successful viva voce examination with the external examiner.

Prizes and Awards
A large number of prizes and awards are available to students of Trinity College. A full list may be found in the Calendar at http://www.tcd.ie/calendar/assets/pdf/prizesawards.pdf.
For ease of reference, below is a summary of those of the first and second medical years.

First Medical Year

Andrew Francis Dixon Prize
This prize was founded in 1946 by a gift from a former student of the School of Physic in memory of Andrew Francis Dixon, University Professor of Anatomy 1903-36. It is awarded annually to the best student of anatomy in the first medical year. Value, €64.

Second Medical Year

Walter Rennison Book Prize
This prize was founded in 1971 by a bequest from G. G. Rennison in memory of his brother Walter Rennison. It is awarded annually to the second year medical student who is placed highest in anatomy. The book(s) selected shall be in use during the medical course in Trinity College. Value, €115.

Daniel John Cunningham Memorial Medal
This prize was founded in 1909 by subscription in memory of Daniel John Cunningham, University Professor of Anatomy 1883-1903. A bronze medal is awarded to the best student in anatomy, taking the first and second medical years into account, provided the student has been not longer than two years in the School of Medicine. The Cunningham Medal is awarded to the student with highest distinction in anatomy as determined by the internal and external examiners.

William Robert Fearon Medal
This award was founded in 1976 by a bequest from Dr Brian Spencer in memory of William Robert Fearon, Professor of Biochemistry 1934-59. A bronze medal is awarded annually to the best student in biochemistry on the basis of studies in the first and second years provided that the student has been in the School of Medicine not longer than two years. The Fearon Medal is awarded to the student with highest distinction in biochemistry as determined by the internal and external examiners.

John Mallet Purser Medal
This award was founded in 1899 by subscription to mark the twenty-fifth year of tenure of the King’s Professorship of the Institutes of Medicine by John Mallet Purser. A bronze medal is awarded annually to the best student in physiology and biochemistry in the first medical year.
GENERAL INFORMATION

Student Information System (SITS) – Access Via my.tcd.ie

All communications from College will be sent to you via your online portal which will give you access to an ‘in trays’ of your messages. You will also be able to view your examinations timetables online – Medicine students must still use the timetables circulated to them from the School. All fee invoices/payments, student levies and commencement fees will be issued online and all payments will be carried out online. You will be able to view your personal details in the new system – some sections of which you will be able to edit yourself. Up until now, all examination results were published online by the Examinations Office at http://www.tcd.ie/vpcao/examinations.php – in future, it is planned that your results will also be communicated to you via the online portal. Future plans for the new system include online module registration and ongoing provision of module assessment results.

As this is a new way of doing things in Trinity, full user helpline facilities, including emergency contact details, will be available from when you register to guide you through these new processes and to answer any queries that you may have.

Blackboard

Blackboard is a learning management system (LMS): lecture material is available online. This is structured in a modular form: each module you are enrolled in has a presence on Blackboard. The module’s structure is decided by the lecturer. You can access your modules by logging onto https://mymodule.tcd.ie. Enter your college username and password to log in.

Textbooks

Medical textbooks generally are very expensive to buy new in Ireland. If you have the opportunity to buy new books abroad, do so. Second-hand books are often available from the Student Union Bookshop or from students who have finished this section of their course. However, beware of buying an old edition of a text, since the pagination at least will have changed and perhaps the contents also. Also, be cautious about disposing of your own books as you move on through the course. In particular, most students find it very valuable to be able to consult textbooks on anatomy, biochemistry and physiology during their clinical years and beyond. As well, you will be asked questions bearing on these disciplines in the clinical year of the course. Recommended texts for the various components of the Junior Freshman Year may be found in each module section.

OFFICIAL STUDENT DOCUMENTATION REQUESTS

Official student documentation can be requested from the Medical Student Executive Officer in the School of Medicine Office, 1st Floor Biomedical Sciences Institute.

Requests can be made in person at the school office or by email using the student request form; requests will not be taken over the phone.

Please give a minimum of 5 working days when requesting documentation.

Academic Transcripts: An official academic transcript showing your final published grade and mark for each academic year.

Student Status Letter: A letter certifying that you are a TCD student, the year of study you are in and your academic standing.

https://medicine.tcd.ie/local/students/doc.php
EXEMPTIONS

Students may apply for exemptions from various disciplines based on previous qualifications. They may be exempted from course work only, or from course work and examinations.

Procedure
In order to apply for exemptions students must return a “Student Module Exemption Form” to the Medical School office before Friday, 11th October 2013. Exemptions cannot be approved after this date. You will be required to submit full transcripts, a copy of a relevant academic qualification and evidence of a primary degree in the subject from which you are seeking the exemption.

Students seeking exemptions must note the following:

- In order to receive an exemption a student must be eligible to obtain an exemption for the entire module. For example you can no longer seek an exemption in one of the subject areas covered in a module. This has to do with assessment requirements and the fact that the School can only return a mark for an entire module.
- Students whom are repeating the year are not generally eligible for exemptions unless it was agreed upon as part of your Academic Appeal to the Senior Lecturer.
- The coursework being used for exemption should be worth, at minimum, an equivalent amount of credits.
- Learning that has taken place more than 5-years ago will likely not be approved due to the distance and the likelihood of advances in the topic.
- The School reserves the right to contact an institution to verify information provided.
- If you think you may wish to seek ECFMG Certification at any point in your life, you should read the details available through http://www.ecfmg.org/certification/index.html
- An official transcript with your details and dates of relevant learning along with formal syllabus/syllabi for relevant modules would be considered as appropriate supporting evidence.
- Please note the School does not have access to transcripts that were provided to College as part of your application process, so you will need to provide these.
- In instances where a student is utilizing postgraduate learning and/or research for justification for an exemption a copy of your abstract should be included as well as a recommendation from your supervisor.
- Students who wish to obtain certification through the US Educational Commission for Foreign Medical Graduates (ECFMG) should be aware that ‘for the purpose of ECFMG Certification, credits earned on or after January 1, 2008 that are transferred to the medical school that awarded or will award an applicant’s medical degrees must meet all of the following criteria:
  - Credits must be transferred from one IMED-listed school to another IMED-listed medical school.
  - Credits must be for courses taken at one medical school within seven years of the date of graduation at the medical school that accepts the transferred courses
  - Credits must be for courses that were passed at the medical school at which the course was taken’

Students who wish to apply for Exemptions may collect the forms from the School of Medicine Office, TBSI or print them Blackboard.
The following text is an extract from the College Calendar 2011 - 2012 (general regulations and information, pages H18 – H19) and should be borne in mind by all students:

“Plagiarism is interpreted by the University as the act of presenting the work of others as one’s own work, without acknowledgement. Plagiarism is considered as academically fraudulent, and an offence against University discipline. The University considers plagiarism to be a major offence, and subject to the disciplinary procedures of the University. 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.

Plagiarism can arise from actions such as: General regulations and information Calendar 2011-12 H19
(a) copying another student’s work;
(b) enlisting another person or persons to complete an assignment on the student’s behalf;
(c) quoting directly, without acknowledgement, from books, articles or other sources, either in printed, recorded or electronic format;
(d) paraphrasing, without acknowledgement, the writings of other authors.

Examples (c) and (d) 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. Students should submit work done in cooperation with other students only when it is done with the full knowledge and permission of the lecturer concerned. Without this, work submitted which is the product of collusion with other students may be considered to be plagiarism. It is clearly understood that all members of the academic community use and build on the work of others. It is commonly accepted also, however, that we build on the work of others in an open and explicit manner, and with due acknowledgement. Many cases of plagiarism that arise could be avoided by following some simple guidelines:

(i) Any material used in a piece of work, of any form, that is not the original thought of the author should be fully referenced in the work and attributed to its source. The material should either be quoted directly or paraphrased. Either way, an explicit citation of the work referred to should be provided, in the text, in a footnote, or both. Not to do so is to commit plagiarism.
(ii) When taking notes from any source it is very important to record the precise words or ideas that are being used and their precise sources.
(iii) While the Internet often offers a wider range of possibilities for researching particular themes, it also requires particular attention to be paid to the distinction between one’s own work and the work of others. Particular care should be taken to keep track of the source of the electronic information obtained from the Internet or other electronic sources and ensure that it is explicitly and correctly acknowledged.

It is the responsibility of the author of any work to ensure that he/she does not commit 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 should include, in their handbooks or other literature given to students, advice on the appropriate methodology for the kind of work that students will be expected to undertake.

If plagiarism as referred to above is suspected, in the first instance, the head of school, or designate, will write to the student, and the student’s tutor advising them of the concerns raised and inviting them to attend an informal meeting with the head of school, or 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 the student to attend. If the student does not in this manner agree to the director of teaching and learning (undergraduate) may also attend the meeting as appropriate. As an alternative to their tutor, students may nominate a representative from the Students’ Union to accompany them to the meeting. General regulations and information H20 Calendar 2011-12 attend such a meeting, the head of school, 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.

If the head of school, 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 §82 above must state their agreement in writing to the head of school, or designate. If the facts of the case are in dispute, or if the head of school, 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.

If the offence can be dealt with under the summary procedure, the head of school, or designate, will recommend to the Senior Lecturer one of the following penalties:

(a) that the piece of work in question receives a reduced mark, or a mark of zero; or
(b) if satisfactory completion of the piece of work is deemed essential for the student to rise with his/her year or to proceed to the award of a degree, the student may be required to re-submit the work.

However the student may not receive more than the minimum pass mark applicable to the piece of work on satisfactory re-submission.

Provided that the appropriate procedure has been followed and all parties in §82 above are in agreement with the proposed penalty, the Senior Lecturer may approve the penalty and notify the Junior Dean accordingly. The Junior Dean may nevertheless implement the procedures as referred to under CONDUCT AND COLLEGE REGULATIONS §2.”
VIVA Policy

- Students will be called to viva **only** if they are:
  - close to pass or
  - close to a higher honours grade where appropriate

- Students are generally notified of VIVA attendance a day before the actual VIVA.

- VIVA questions may cover any aspect of the material from the module for that academic year.

- Students can **not** be marked down in the viva

- There will be **no** mark awarded for the viva, only a move to a higher grade

- An external examiner should have oversight of the viva process and a note should be written on all students who fail and are not brought up to the pass grade at the Viva.

- Students who perform very badly in the written or clinical exam and who cannot pass irrespective of their Viva Voce performance should **NOT** be called for a Viva.
  - The department at a later date may interview them.

- A short report on each student’s performance at viva must be maintained in case of FOI requests
PERSONAL INJURY PROCEDURE

Practical Schedule

Please read carefully the information below concerning safety in the laboratory and in the clinical situation.

Safety in the Laboratory

- Make yourself aware of the emergency exits from the laboratory
- In the event of evacuation specific instructions will be given

Many cultures used in the laboratory are potentially pathogenic. It is therefore vital that good safe laboratory practice and aseptic technique should become second nature to the student. It is good practice to follow the same safety rules irrespective of the degree of hazard involved.

- You are required to own and wear a Howie style laboratory coat (sold in the Student’s Union Shop) at all practical sessions. Failure to do so will exclude you from the practical session. The coat must be buttoned up at all times. This is to protect your normal clothes from contamination and damage. This must not be worn on the wards or elsewhere.

- No smoking, eating or drinking is permitted in the laboratory.

- If you spill cultures report the fact immediately to a demonstrator, who will give you further instructions.

- All materials should be handled so that there is no inadvertent contamination of the environment or yourself. For example, wet preparations of bacteria on sides and used pipettes should be submerged in disinfectant immediately after use to prevent contamination on the bench. Do not work with bacterial cultures or chemicals over a laboratory manual or notebook.

- Do not rush around or carry sharp items around the laboratory. At any sign of misconduct you will be asked to leave the laboratory.

- Always leave the bench clean and tidy. Always remember that in shared laboratory areas other students will be using the bench and their safety should not be put at risk.

- Always wash hands with Hibiscrub before leaving the laboratory. Dry them thoroughly with a paper towel.

- Report any accident/incident, even if trivial, to a demonstrator.
Sources of Support and Help in College

- **Student Counselling Service** – 3rd Floor, 7-9 South Leinster Street, Tel: 896 1407, or email: student-counselling@tcd.ie Emergency appointments are available. (Entrance to the Service via College Campus adjacent to the Creche). This service is confidential and free to students.

- **Chaplains** – House 27, chaplaincy@tcd.ie. Tel: Paddy Gleeson and Peter Sexton: 896 1260, Darren McCallig : 896 1402 ; Julian Hamilton : 896 1901 - 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. [http://www.tcd.ie/Chaplaincy/](http://www.tcd.ie/Chaplaincy/)

- **College Health Service** – House 47 (beside the rugby pitch), Tel: 896 1556. Appointments may be made in person or by telephone. This service is free to most students. [http://www.tcd.ie/College_Health](http://www.tcd.ie/College_Health)

- **College Tutors and Senior Tutor’s Office**, House 27. Tel: 896 2551. stosec@tcd.ie. You can find your tutor’s name and contact number on the Student Information System: [http://isservices.tcd.ie/portal](http://isservices.tcd.ie/portal)

- **Niteline** - A confidential help-line for students run by students is available during term-time, by telephone between 9pm and 2.30am from Thursday to Sunday at 1800 793 793.

- **Student 2 Student** - A group of Trinity students trained in listening and support skills who are available for face-to-face supportive chats. Confidential, free, and flexible. Email: peer@tcd.ie, phone: 896 2438.

**Student 2 Student**

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’ll 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 contact with you throughout your first year and invite you to events on and off campus. They’ll 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 a coffee and a chat. S2S is supported by the Senior Tutor’s Office and the Student Counseling Service. [http://student2student.tcd.ie](http://student2student.tcd.ie), E-mail: student2student@tcd.ie, Phone: + 353 1 896 2438

**Trinity College Students Union**

[www.tcdsu.org](http://www.tcdsu.org)

The services that the Union provides include a Welfare and Education drop-in service, where students can look for help and advice on pretty much any issue affecting them, no matter how large or small. The Union also runs two shops on campus, in House 6 and at the Hamilton Building. A student travel card can be purchased in House 6 that entitles the bearer to cheaper student-rate travel and discounts in several shops. The Union also has a bookshop in House 6 and can give out small interest free loans if you’re stuck.

The JCR, located in Goldsmith Hall is another service provided by the SU which offers low cost food with a relaxed atmosphere.

Education Officer – Phone: (01) 6468 439 Email: education@tcdsu.org

Welfare Officer – Phone: (01) 6468 437 Email: welfare@tcdsu.org

The details for executive officers & school conveners can be found at [http://www.tcdsu.org/info/executive-officers](http://www.tcdsu.org/info/executive-officers)

**Disability Services**

The Disability Service promotes the needs of students with disabilities in Trinity by providing advice, support and academic accommodations in partnership with students and academic disciplines. It provides
advice and information to applicants, makes referrals, and advises academic and administrative staff on
issues pertaining to barrier free access and disability related issues.
Contact: disab@tcd.ie Tel: 01 896 3111

Bullying and Sexual Harassment
The College and affiliate Teaching Hospitals have strict policies and procedures in relation to *bullying and sexual harassment*. Details are available via the following links:

**Trinity College Dublin** *Dignity and Respect policy*
[http://www.tcd.ie/about/policies/respect.php#studbroch](http://www.tcd.ie/about/policies/respect.php#studbroch)

**Tallaght Hospital, St James’s Hospital, Naas Hospital, St Patrick’s Hospital** *Dignity at Work Policy*
[http://www.medicine.tcd.ie/education/dignity/](http://www.medicine.tcd.ie/education/dignity/)

Skills4Study Campus
Getting started
*skills4studycampus* is an online resource offering e-learning modules on: *Writing skills; Referencing and understanding plagiarism; Reading and note-making; 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. Based on *The Study Skills Handbook*, skills4studycampus is available 24 hours a day, 7 days a week.

**How do you access it?**
- Activate your TCD student username and password that you were given at registration.
- Visit: [http://www.tcd.ie/local/](http://www.tcd.ie/local/)
- You will need to use your TCD username and password to access the Local homepage.
- Click on the skills4studycampus link at the bottom right hand side of the page.
- Go to ‘First time accessing the resource?’ at the bottom of the screen, and click on the link to register.
- Complete the registration form.
- You will receive an email from skills4studycampus confirming your details.
- **You must always log in via [www.tcd.ie/local](http://www.tcd.ie/local)**

When you first access the resource, we recommend that you sign-up for the student newsletter from the creators of skills4studycampus, offering tips, advice, and competitions.

From the list on the left of the homepage, we recommend that you choose the most appealing module for you and take the diagnostic test. (Most students start with *Reading and note-making.*) This will identify which parts of the module are most useful to you. From there, simply explore the resource one page at a time. The activities are designed to appeal to a variety of learning styles, if you prefer to listen to material rather than reading it, click on the audio icon at the top-left of the screen.

**Getting ready for academic study**
Before registration and orientation week in Trinity, you can try out skills4study campus. The first section of the introductory module ‘Getting ready for academic study’ is freely available and it is not necessary for you to be registered in Trinity [http://www.palgrave.com/skills4studycampustaster/An_introduction.html](http://www.palgrave.com/skills4studycampustaster/An_introduction.html)
We also recommend that you explore subject specific resources and study tips at [http://www.palgrave.com/skills4study/](http://www.palgrave.com/skills4study/)

**Questions?**
Many common questions are answered within the resource by following the ‘Help and FAQs’ link at the top right-hand corner of the screen. If you have any other questions, please contact alison.doyle@tcd.ie
Your tutor is the person to go to if, for example:
- You are ever worried about any aspect of your personal or College life.
- You are unwell or require extra support during examinations or if you arrive late for an examination!
- Your academic work is being affected for any reason.
- You are worried or unsure about your studies, course or simply being at College.
- You wish to file an Academic Appeal.
- If you wish to take a year out.
- You are experiencing financial hardship or need financial assistance.
- You need to talk to someone who can point you in the right direction or refer you to the best people to help you.

The School of Medicine Office is happy to support you throughout your studies. Your tutor is also here to help you during your time at College.

Talk to your Tutor – they won’t mind – it’s what they do.
Friday 1st November

Take to the streets to support:

Targeted Cancer Therapy, SJH Medicine for the Elderly, AMNCH
The Burns Unit, SJH
Trinity Access Programme

Street Collection, Campus Games, Talent Show, Night Out, Med Cup and much more!

Email: medday@csc.tcd.ie  Website: tcdmedday.com  Facebook: Trinity Med Day  Twitter: @TrinityMedDay