Principles of Biomedical Sciences

MEDC 115.18/DENT 291.18
TERM 1

COURSE SYLLABUS
2015/2016

UNIVERSITY OF SASKATCHEWAN
College of Medicine
COURSE DESCRIPTION
The practice of medicine requires grounding in scientific principles, as well as understanding how current medical knowledge is scientifically justified, and how that knowledge evolves. The principles that underlie biological complexity, genetic diversity, human development, micro and gross anatomy, and the influence of nutrition and environment guide our understanding of human health, and disease. Curiosity, skepticism, objectivity, and the use of scientific reasoning are fundamental to the practice of medicine. This course will introduce students to the principles of physiology, histology, embryology, anatomy, genetics, oncology, nutrition, pharmacology, microbiology, immunology, and pathology that form the scientific basis of clinical medicine. (Scientific Foundations for Future Physicist: Report of the HHMI and AAMC Committee. Howard Hughes Medical Institute (HHMI) and the Association of Medical Colleges (AAMC), 2009; Future of Medical Education in Canada: A Collective Vision for MD Education. Association of Faculties of Medicine of Canada (AFMC), 2010.)

OVERALL COURSE OBJECTIVES
By the completion of the Principles in Biomedical Sciences course, students will be expected to:

1. Explain the normal form and function of the human body with introductory application to human health and disease.
2. Explain the basics of human nutrition and its role in supporting optimum health and to be able to advise patients on appropriate up-to-date dietary strategies
3. Apply, at an introductory level, principles of genetics to the diagnosis and management of common genetic disorders and have an approach to basic genetic counseling.
4. Describe the basic principles of pharmacology, how various agents alter homeostasis and, the pharmacological basis of therapeutics.
5. Explain the basic principles of general pathology, immunology and microbiology with introductory application to human health and disease.

In addition, each discipline-specific module in the course will also have its own specific objectives.

COURSE CONTACTS
Course Chair: Dr. Susan Gilmer susan.gilmer@usask.ca (306) 966-4091
Administrative Coordinator: Cheryl Pfeifer cheryl.pfeifer@usask.ca (306) 966-6138
Administrative Assistant: Karen Amundson karen.amundson@usask.ca (306) 966-7202

COURSE SCHEDULE
The Principles of Biomedical Sciences Course is organized in 5 modules running concurrently on specific assigned days. Session schedules for each of the modules will be posted in MEdIC on One45.

All information relating to this course is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

COURSE MODULES
Physiology, Histology, Embryology, and Anatomy (PHE&A)
Genetics and Oncology
Nutrition
Pharmacology
Microbiology/Immunology/Pathology (M/I/P)
COURSE DELIVERY
Students will learn through a variety of methods, including:

- Large group sessions including lectures, interactive discussions, case-based problem solving
- Facilitated small group learning sessions
- Independent self-directed reading and exercises

COURSE MATERIAL ACCESS
Course materials are available on MEdIC in One45 (in PAWS). The syllabus, forms, and other useful documents will be posted there.

- If you have not been assigned a user name (NSID – U of S Network Service ID) and password for PAWS, contact Student Central 306-966-1212 or contact IT Services Help Desk 306-966-4817.

Course materials and electronic assignment submission will be done through Course Tools (bblearn).

POLICY FOR SUCCESSFUL COMPLETION & REMEDIATION
As per University of Saskatchewan standards a passing grade is 50%. However, in order for a student to be promoted to Foundations of Clinical Medicine upon completion of the Principles of Biomedical Sciences Course (hereafter called “Principles”) students must achieve a minimum grade of 70% in each of the five modules within the Principles course [(1) PHEA (Physiology, Histology, Embryology, Anatomy), (2) Genetics and Oncology, (3) Nutrition, (4) Pharmacology and (5) MIP (Microbiology, Immunology and Pathology) Modules].

A student’s grade for each module will be determined at the end of term based on a combination of the weighted graded assessments within each individual module as described in each module section of the syllabus.

The requirements for successful completion of the Principles Course are listed below. Please note that students must meet the overall Term I promotion standards in order to be promoted to Foundations I (see Student Information Guide):

A) Students will be considered to have successfully completed the Principles Course if they have achieved a minimum 70% average grade in each of the five modules.

B) Students who have not received the required 70% average grade in any of the five modules will be deemed to be experiencing academic difficulty. The severity of academic difficulty will be based on a weighted grade deficit assessment (see Table 1 for grade deficit point allocation rubric). In order to intervene with student in danger of experiencing academic difficulty, we will meet with students having a mark of less than 70% in any three modules in any of the midterm exams. These meetings will be between the student and a course sub-committee of at least 3 people (made up of Course Chairs(s); relevant Module Director(s); Year Chair or designates) to discuss ways to improve academic performance. The goal of such a meeting is not meant to be punitive, but should be student-centered, and focused on the success and well being of the student. With any further accrual of deficit points, the student will be required to again meet with the course sub-committee.

C) At the end of term, students who are identified as being in academic difficulty as defined in (B) above may potentially be offered remediation for the modules for which they did not achieve the standard. This remediation will be in the form of additional assignments and/ or supplemental examinations as determined by the module director and/ or course chair. The determination of eligibility for either type of remediation will be based on a weighted grade deficit assessment (see Table 1 for grade deficit point allocation rubric). Students will be offered remediation up to and including the point where they have accrued a maximum of six grade deficit points for Principles. Supplemental assignments and/or supplemental exams will be written as arranged between the student, module director and/ or course chair(s). These supplemental assignments and examinations will be written in the first week of term II and must be completed within one month after the completion of final examination period, unless otherwise arranged by the student and the Course Chair.

D) Students who have accrued seven or more grade deficit points will be considered to have been unsuccessful in the Principles Course and will NOT be offered supplemental assignments and/ or examinations as per usual course policy. The Year I Term I Promotions Committee and the Student Academic Management Committee will adjudicate further decisions regarding academic outcomes.
E) Students who have not achieved the required 70% average grade in each of the five modules and who have written a supplemental examination, but who still have not achieved the required standard, will be required to meet with the Course Sub-Committee to determine a course of action, which may include additional opportunity to remediate if they have fewer than seven deficit points as defined in Section (C); or may include a decision that the student has been unsuccessful in the course and will NOT be offered further supplemental examinations.

F) Success in supplemental assessment will be accorded a maximum grade equivalent to the minimum requirement for that component of the course (70% for a Module).

G) A mark of 0% will be given for any missed assignment, quiz, or examination, unless otherwise arranged as per the College of Medicine Attendance Policy and Deferral Policy.

Students who are eligible for supplemental examination will be contacted by the Module Director and should arrange to meet with the Module Director or designate to discuss educational issues and develop a learning plan.

Table I: Grade Deficit Point Allocation

<table>
<thead>
<tr>
<th>Overall Grade Achieved in Module before Remediation</th>
<th>PHEA</th>
<th>Genetics and Oncology</th>
<th>Nutrition</th>
<th>Pharmacology</th>
<th>MIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average 69 – 60%</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Average 59 – 50%</td>
<td>II</td>
<td>II</td>
<td>II</td>
<td>II</td>
<td>II</td>
</tr>
<tr>
<td>Average &lt; 50%</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
</tbody>
</table>

| Mark of 60 – 69%                                   | I    | II                    | III       |
| Mark of 50 – 59%                                   | II   | III                   |
| Mark < 50%                                         | III  |

I: one grade deficit point; II: two grade deficit points; III: three grade deficit points

**MIDTERM AND FINAL ASSESSMENT DATES**

Midterm examinations for PHE& A will take place on September 22 and October 27, 2015
Midterm examinations for Genetics, Nutrition, Pharmacology, and M/I/P will take place on October 1 and November 3, 2015.

Practical and Written final exams for the Principles Course will be taking place on December 7, 9 and 11, 2015.
IMPORTANT AND RELEVANT STUDENT INFORMATION
The following information is extremely important for your success in medical school. To avoid duplication and ensure clarity, please refer to the Student Information Guide or UGME website for the following policies:

COLLEGE OF MEDICINE CONTACTS
LIST OF IMPORTANT DATES
ATTENDANCE POLICY
ETHICS AND PROFESSIONALISM
BREACH OF PROFESSIONALISM
STUDENT ASSESSMENT/EXAMINATION POLICIES
OFFICE OF STUDENT AFFAIRS
GUIDELINES FOR PROVIDING FEEDBACK
PROGRAM EVALUATION
Principles of Biomedical Sciences – Module Syllabus

This section of the course syllabus will describe the specific objectives, requirements and expectations, and assessment procedures for each module within the Principles of Biomedical Sciences Course.

**MODULE 1**

Physiology, Histology, Embryology, and Anatomy (PHE&A)

**MODULE COORDINATOR**

Dr. Wolfgang Walz

Email Address: wolfgang.walz@usask.ca

Phone Number: 306-966-7618

Office Location: HSB GD30.8

Office Hours: Please use email for appointment

**MODULE DESCRIPTION**

This module covers the basic principles of physiology, histology, embryology, and anatomy relevant to biomedical sciences. Each of these disciplines is presented as a section in this module. It is expected that the material covered in this module will be expanded upon, applied, and distributed into the courses presented throughout the rest of the undergraduate medical education program.

**GENERAL MODULE OBJECTIVES**

See each individual section on the following pages. (Physiology, Histology, Embryology and Anatomy). Detailed learning objectives can be found on One45 for each individual session.

**COURSE SCHEDULE**

All information relating to this course is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

**REQUIRED RESOURCES**

See each individual section on the following pages. (Physiology, Histology, Embryology and Anatomy)

**COURSE DELIVERY**

Along with didactic sessions, you will be using anatomy labs, virtual microscopy, integrative cases, in-class clicker quizzes, and other assignments.

**STUDENT ASSESSMENT**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterms *</td>
<td>30%</td>
</tr>
</tbody>
</table>
| Assignments                | 20%    | Histology and Anatomy assignments and quizzes dates are posted in One45
| Final Written *            | 25%    | Will consist of multiple and short answer questions and cases. |
| Final Practical Lab Exam   | 25%    | Anatomy and Histology stations. This mark will also include the necropsy report. |

* All sections (Physiology, Histology, Embryology and Anatomy) will be covered.
Physiology Section

SECTION LEAD
Dr. Wolfgang Walz
Email Address: wolfgang.walz@usask.ca
Phone Number: 306-966-7618
Office Location: HSB GD30.8
Office Hours: Please use email for an appointment.

SECTION DESCRIPTION
The section gives an overview about the functions of the normal body and how it handles extreme, but not yet pathological conditions. Thus the students gain an understanding on the workings of the normal human body and the limits of its functioning. As much as possible the connections to pathological conditions is made, so the students can judge the grey zone between extreme, but still functioning, situations and appearance and genesis of pathological conditions.

SECTION OBJECTIVES
By the completion of this module, students will be expected to:
- Define some of the basic terms used in Physiology.
- Explain and apply the concept of homeostasis.
  - Recall numerically important physiological variables and perform simple calculations
  - Relate the consequences of changes in normal physiology to selected disease states
- Describe in general terms the functions of the major body systems.
  - Explain how various cellular mechanisms determine the functions of the major organs.
  - Explain how cells interact with each other and how their activities are coordinated to produce organ functions.
- Describe how organ systems interact and how their activities are coordinated.
  - Explain the mechanisms underlying neural and endocrine communication.

SECTION SCHEDULE
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
There are no required resources. A recommended textbook throughout the first two years physiology is:

SECTION DELIVERY
Didactic sessions with frequent clinical examples. These clinical cases accompanied by a catalogue of questions. These problems will be discussed in class.

STUDENT ASSESSMENT
See Student Assessment section on Physiology, Histology, Embryology and Anatomy page.
**Histology Section**

**SECTION LEAD**
Dr. Helen Nichol
Email Address: h.nichol@usask.ca
Phone Number: 306-966-4094
Office Location: HSB 3B40
Office Hours: By appointment only

**SECTION DESCRIPTION**
This module begins with an introduction to cells and a review of basic cell biology. Cells and substances produced by cells are organized into the five basic tissues, namely blood, epithelium, connective, nerve and muscle tissue. The components and functions of the five basic tissues and integument are covered in module 1. In subsequent histology components in the Foundations courses, students will learn how these basic tissues are organized into organs and organ systems.

**SECTION OBJECTIVES**
By the completion of this module, students will be expected to identify the five basic tissues in a variety of histological sections. Detailed learning objectives can be found on One45 for each individual session.

**SECTION SCHEDULE**
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdiC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

**REQUIRED RESOURCES**
Textbooks: Both are available as Kindle editions.
Wheater’s Functional Histology by Barbara Young, Phillip Woodford and Geraldine O’Dowd (2013) [ISBN 978-0-7020-4747-3]
OR

**SECTION DELIVERY**
Along with didactic lectures, you will be doing histology labs using virtual microscopy and the histology study room.

**STUDENT ASSESSMENT**
See Student Assessment section on Physiology, Histology, Embryology and Anatomy page.
Embryology Section

SECTION LEAD
Dr. Greg Malin
Email Address: greg.malin@usask.ca
Phone Number: 306-966-4083
Office Location: HSB B526.2
Office Hours: By appointment only

SECTION DESCRIPTION
This section provides a brief introduction into the earliest stages of human development. The focus will be on developmental processes starting from conception through the first 4 weeks of development and cellular differentiation. This will provide the necessary embryologic background in order to learn specific organ system and tissue development and differentiation in the Foundations of Clinical Medicine course.

SECTION SCHEDULE
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
Larsen’s Human Embryology by Shoenwolf, Brauer [978-0443-06811-9]

SECTION DELIVERY
Didactic sessions

STUDENT ASSESSMENT
See Student Assessment section on Physiology, Histology, Embryology and Anatomy page.
Anatomy Section

SECTION LEAD
Dr. Adel Mohamed
Email Address: adel.mohamed@usask.ca
Phone Number: 306-966-4085
Office Location: HSB 3D01.6
Office Hours: By appointment only

SECTION DESCRIPTION
To provide an introduction to gross human anatomy, this section of this module is presented in three main formats: active cadaveric dissection, surface anatomy, and medical imaging. The majority of the section time will be spent in active cadaveric dissection.

Active Cadaveric Dissection

LEAD
Dr. Adel Mohamed
Email Address: adel.mohamed@usask.ca
Phone Number: 306-966-4085
Office Location: HSB 3D01.6
Office Hours: By appointment only

DESCRIPTION
The students’ emotional responses to their cadaver and, for many, their first confrontation with death and dying present a true teaching opportunity. “Compassion and true understanding go hand in hand, and it is only with a hands on dissection.”

SECTION OBJECTIVES
During the sessions, students will be expected to:

- Learn the vocabulary, which describes the gross structure of the human body.
- Participate in and complete a cadaveric dissection of a human body.
- Use the information gathered in the cadaver lab, in class, and in the assigned assignments to appreciate the human form.
- Practice technical skills necessary for anatomical dissection as a prelude for future clinical experiences in surgery or related areas.
- Demonstrate knowledge of common clinical problems associated with important anatomic structures (through the Necropsy report assignment).
- Relate whenever attainable planar radiograms, CT and MR images of normal structures to corresponding features revealed by dissection.

By the completion of this module, students will be expected to:

- Demonstrate effective dissection techniques.
- Explain the details of human anatomical structure.
- Demonstrate an increased appreciation for the intricacies of the human form.
- Attend the Commemorative services for the donors.
SECTION SCHEDULE
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
Students will conduct dissections on preserved embalmed human bodies, specimens. In laboratory, students will need to bring the following materials (available from university books store):

- Sharp scalpel blades, large (12)
- Forceps, blunt point (1)
- Dissecting needles or probes (1)
- Examination Gloves
- Eye protection if needed (e.g. glasses or goggles)
- Protective clothing (e.g. lab coat)
- Anatomy Atlas (one per cadaver, Grant’s or Netter’s)

Go into anatomy lab early and often. Make sure you keep up with the learning objectives throughout and ask questions if something is unclear.

One of:
Essential Clinical Anatomy by Moore KL, Agur MR [987 1145 1187496]
Grant’s Atlas of Anatomy [978 0781796125]
Netters Atlas of Human Anatomy [9781455704187]

SECTION DELIVERY
The anatomy dissection course is partly instructor directed but mostly self, independent and experiential learning driven. Each lab will begin promptly with a brief dissection demonstration by anatomy instructors as needed. Students need to prepare for the lab in advance by prior reading of dissection objectives.

The class will be divided into several groups of 7-9 students per cadaver. Half of each group will be dissecting and the other half will be assigned to other activities (Ultrasound and Surface Anatomy sessions). All groups are expected to attend the first 10-15 minutes of dissection demonstration of each lab, in addition, the undissected half of each groups are expected to return to lab and attend the last 20 minutes to learn what has been dissected.

If you must miss a laboratory session (dissection, ultrasound or surface anatomy), it is required that arrangements be made to make up the study during another time. Laboratory instructors are available for consultation during regularly scheduled office hours (8am-5pm). Students should expect a brief quiz during labs (e.g., one per single lab or one per entire upper limb labs).

STUDENT ASSESSMENT
See Student Assessment section on Physiology, Histology, Embryology and Anatomy page.

Surface Anatomy

LEAD
Dr. Tom Langer
Email Address: tlanger@saskel.net
Phone Number: 306-966-4075
Office Location: 4D01.13 HSB
Office Hours: By appointment only
OBJECTIVES

During the sessions, students will be expected to demonstrate knowledge of topographical anatomy of the entire human body.

SECTION DELIVERY

While half of each group is dissecting, the other half will be assigned to Surface Anatomy or Ultrasound sessions. All groups are expected to attend the first 10-15 minutes of dissection demonstration of each lab. The surface anatomy groups will also be expected to return to lab for the last 20 minutes to learn what has been dissected.

If you must miss a session, it is required that arrangements be made to make up the study during another time. Laboratory instructors are available for consultation during regularly scheduled office hours (8am-5pm). Students should expect a brief quiz during labs (e.g., one per single lab or one per entire upper limb labs).

Ultrasound Guided Medical Education: Anatomy

LEAD

Dr. Paul Olszynski

Email Address: p.olszynski@usask.ca

Phone Number: 306-370-0357 (cell) or 306-655-1446

Office Location: 2646 RUH

Office Hours: By appointment only

DESCRIPTION

The growing worldwide use of clinician-performed ultrasound (CPU) heralds a dramatic change in medical education, bedside medicine, and patient care. With steadily improving portability, accessibility and technology, ultrasound continues to be a rapidly growing part of healthcare worldwide. Likewise, the application of CPU in medical education is also increasing, with medical schools throughout Europe and North America integrating ultrasound-based learning throughout their undergraduate curriculum. As a learning tool, ultrasound allows students to assess (through real and dynamic imaging) and explore key anatomic and physiologic concepts as related to their course objectives and outcomes.

OBJECTIVES

During the sessions, students will be expected to:

- Demonstrate basic image generation skills
- Explain and describe human anatomical structure as seen in 2D ultrasound images
- Demonstrate an increased appreciation for the dynamic nature of human anatomy (functional anatomy)

SECTION DELIVERY

The ultrasound-guided anatomy section is instructor directed (instructors will be supervising and assisting with image generation at each session) but also requires a significant amount of self, independent and experiential learning. Students need to prepare for the lab in advance by watching short tutorial videos (~15 minutes/session) that will introduce learners to the image generation techniques required for the given session.

Class will be divided into several groups of 4-5 students per volunteer patient/ultrasound machine. While half of the groups will be undertaking their ultrasound guided anatomy session, the other half will be assigned to other activities (independent study). After an hour, the groups will swap activities. All groups are expected to return to the dissection lab and attend the last 20 minutes to learn what has been dissected.
MODULE 2

Genetics and Oncology Module

MODULE DIRECTOR
Dr. Edmond G. Lemire

Email Address: edmond.lemire@saskatoonhealthregion.ca

Phone Number: 306-655-1692

Office Location: Ellis Hall, Room 515

Office Hours: By appointment only

MODULE DESCRIPTION
Genetics is playing an increasingly significant role in the diagnosis and management of patients. This course is the largest and only formal exposure that medical students will have to medical genetics. As such, it is important that students acquire knowledge of the basic principles and concepts of medical genetics. Through a combination of quizzes (see separate handout on Clicker Quizzes), clinical case presentations, small group activities and assignments, it is hoped that the medical students, as future physicians, will be able to apply this knowledge in a clinical setting. This course consists of 19 hours of class time. The instructors will assume that students have the necessary academic requirements to successfully complete this course. Students may assess their knowledge using the Self-Assessment Test which consists of 15 multiple choice questions. Students experiencing any difficulties with the self-assessment will need to strengthen their knowledge of genetics in order to successfully complete the course.

Cancer is a complex topic and specific cancers, their diagnoses and treatments will be integrated into each system. This 3 hour introduction will provide the background information needed to understand the terminology used in diagnosing and studying cancer along with the basic principles of cancer epidemiology and management. This will be achieved through a series of lectures and case presentations. For specific information or questions on the oncology portion of this module, please contact Dr. Julie Stakiw (306-655-2980; Julie.stakiw@saskcancer.ca).

MODULE OBJECTIVES
By the completion of this module, students will be expected to:

- Recognize the importance of genetic factors in determining the health of individuals and populations.
- Apply the basic principles of genetics to the understanding, diagnosis and management of genetic diseases.
- Analyze genetic pedigrees.
- Analyze genetic test reports.
- Identify online genetic resources.
- Recognize the terms associated with studying cancer
- Identify the different cancer management modalities and their intent when used

Detailed learning objectives can be found on One45 for each individual session.

MODULE SCHEDULE
All information relating to this course is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
Turning Point clicker for in-class quizzes.

MODULE DELIVERY
Through a combination of didactic lectures, clicker quizzes, clinical case presentations and assignment, this exposure to medical genetics should provide the foundation for medical students, as future physicians, to integrate and apply this knowledge in a clinical setting. The oncology section will consist of didactic lectures.
STUDENT ASSESSMENT

One Genetics Assignment 10%
In-Class Clicker Quizzes 15%
Genetics Section of the Midterm Exam I 25%
Genetics Section of the Midterm Exam II 25%
Genetics and Oncology Sections of the Final Exam 25%

The Genetics in-class clicker quizzes will consist of two multiple choice questions based on the assigned pre-reading material.

Both the midterm and final examination will consist entirely of multiple choice questions (MCQs).
MODULE 3

Nutrition Module

MODULE DIRECTOR
Dr. Louise Gagne
Email Address: lgagne@sasktel.net
Phone Number: 306-652-0300
Office Location: Saskatoon Community Clinic
Office Hours: By appointment only

MODULE DESCRIPTION
The module covers a broad overview of basic nutrition relevant to medical practice. Topics include: nutrition and chronic disease (e.g. cancer, coronary artery disease, type 2 diabetes, obesity, depression), macronutrients (protein, carbohydrates and fats), minerals, vitamins, phytochemicals, fiber, whole foods, healthy meal planning, diets (Mediterranean, vegetarian, vegan, weight loss, cholesterol lowering), liquids, diet through the life cycle, food allergies, celiac disease, nutrient-drug and nutrient-nutrient interactions, nutritional supplements, environmental issues, organic food and nutritional resources.

MODULE OBJECTIVES
• Describe the key components of a healthy diet.
• Outline dietary strategies to prevent or ameliorate a number of chronic health conditions.
• Advise patients about the risks and benefits of some common nutritional supplements.
• Advise patients about food allergies and food intolerances
• Advise patients about potential drug-nutrient interactions
• Describe and discuss some important social and environmental issues regarding food.

Detailed learning objectives can be found on One45 for each individual session.

MODULE SCHEDULE
All information relating to this course is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
In Defense of Food by Michael Pollan [0-14-314274-7]

MODULE DELIVERY
The module will be taught through didactic lectures, case discussions, viewing of a film and assigned reading material for self-study.

STUDENT ASSESSMENT
Midterm I 30%
Midterm II 30%
Food, Inc. Film Review 10%
Nutrition Section of the Final Exam 30%
Pharmacology Module – MEDICAL STUDENTS ONLY

MODULE DIRECTOR
Dr. Kaushik (Kash) Desai
Email Address: k.desai@usask.ca
Phone Number: 306-966-2723
Office Location: 2D30.7 Health Sciences Building
Office Hours: 9:00 am to 5:00 pm

MODULE DESCRIPTION
The module of pharmacology will briefly deal with the historical development of pharmacology and major drug discoveries. The module will provide knowledge about general principles of pharmacology including pharmacodynamics and pharmacokinetics, drug interactions, principles of therapeutics in specific age groups of patients, fundamental principles of toxicology, concepts of drugs modulating the autonomic nervous system and basic principles of chemotherapy.

MODULE OBJECTIVES
By the completion of this module, students will be expected to:

- Describe the principal mechanisms by which drugs act in the body and differentiate between therapeutic effects and unwanted effects of drugs.
- Describe the pharmacokinetic factors which affect the amount of drug and its duration of action in the body.
- Apply the knowledge gained in this course to drugs taught under different systems.

Detailed learning objectives can be found on One45 for each individual session.

MODULE SCHEDULE
All information relating to this course is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
Recommended textbooks:

MODULE DELIVERY
The module will be taught through didactic lectures, assigned reading material for self-study, voluntary case presentations, and an essay on a specific drug.

STUDENT ASSESSMENT
<table>
<thead>
<tr>
<th>Assessment</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm I</td>
<td>23%</td>
</tr>
<tr>
<td>Midterm II</td>
<td>22%</td>
</tr>
<tr>
<td>Drug Essay</td>
<td>15%</td>
</tr>
<tr>
<td>Pharmacology Section of the Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>
MODULE 5

Microbiology, Immunology and Pathology Module (M/I/P)

MODULE DIRECTOR
Dr. Bill Albritton
Email Address: william.albritton@usask.ca
Phone Number: 306-966-6655
Office Location: HSB 6B61
Office Hours: By appointment only

MODULE DESCRIPTION
To provide a deeper understanding of disease processes, this section of this module is comprised of the basic principles of microbiology, immunology and pathology.

MODULEOBJECTIVES
See each individual section on the following pages. (Microbiology, Immunology and Pathology). Detailed learning objectives can be found on One45 for each individual session.

MODULE SCHEDULE
All information relating to this course is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES
See each individual section on the following pages. (Microbiology, Immunology and Pathology)

MODULE DELIVERY
See each individual section on the following pages. (Microbiology, Immunology and Pathology)

STUDENT ASSESSMENT
Midterm I 15%
Midterm II 15%
Assignments: Immunology Concept Maps, Histology and Pathology assignments and dates are posted in One45 30%
M/I/P section of the Final Exam - MCQs and high level MCQs as well as short answer questions 40%
Microbiology Section

SECTION LEAD
Dr. Kathy Malejczyk
Email Address: kathy.malejczyk@rqhealth.ca
Phone Number: 306-766-4805
Office Location: Regina General Hospital Microbiology Laboratory 1E17.05
Office Hours: By appointment only

SECTION DESCRIPTION
Microbiology is the study of micro-organisms (bacteria, viruses, fungi and parasites). Infectious diseases are diseases caused by living organisms, mostly microscopic but occasionally large enough to be visible to the naked eye (e.g. some parasites) that infect or infest the human body. Infectious diseases play a unique role in human health and disease:

- They may be transmitted from person to person
- They may be acquired from the environment, food / water or animals
- There is a complex interaction between host, microbe and environment that determines whether or not infection and disease occurs
- Infectious diseases often affect the community as well as individual patients

In contrast to many other conditions you will study in systems, you will find there is an extra layer of complexity in the study of infectious diseases in that one pathogen may cause a variety of different diseases depending on the host, the site of infection etc. and a single disease entity may be caused by a variety of different pathogens, which in turn may result in different treatment requirements.

Within the MIP module, 10 hours are dedicated to a basic foundation for microbiology and infectious diseases. With this limited time, only a very rudimentary approach to this important topic can be achieved. Students are strongly urged to obtain and use the recommended text throughout their systems to supplement the sessions in MIP and assist them in developing a more robust understanding of infectious diseases.

SECTION OBJECTIVES
By the completion of this module, students will be expected to:

- Describe how micro-organisms are classified*
- Compare and contrast bacteria, viruses, fungi and parasites.
- Describe mechanisms whereby pathogens cause disease
- Describe how infectious diseases are acquired (transmitted)
- Describe the basic principles of antimicrobial therapy
- Describe principles of diagnostic testing and the appropriate use of the microbiology laboratory

* Classification has important implications for pathogenesis, disease manifestations and treatment – and therefore identifying where pathogens ‘fit’ is an important skill that will directly impact care of patients.

SECTION SCHEDULE
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.
REQUIRED RESOURCES
Review of Medical Microbiology and Immunology (Lange ...Medical Books) Paperback. by Warren Levinson (Author). 978-0071818117
Clinical Microbiology Made Ridiculously Simple: Mark Gladwin MD, William Trattler MD, C. Scott Mahan MD: 9781935660156:

SECTION DELIVERY
This material is delivered as whole class sessions. Pre-reading as well as post-lecture reading will be required (and is essential) for all sessions. Sessions will be delivered from either Saskatoon or Regina and video conferenced to the other location. Whenever permitted by the instructor, sessions will be recorded for reference and review.

STUDENT ASSESSMENT
See Student Assessment section on the Microbiology, Immunology and Pathology page.
Immunology Section

SECTION LEAD
Dr. Peter Bretscher
Email Address: peter.bretscher@usask.ca
Phone Number: 306-966-4322 and
Office Location: HSB 6855 and
Office Hours: By appointment only

Dr. William Albritton
Email Address: william.albritton@usask.ca
Phone Number: 306-966-6655
Office Location: HSB 6861
Office Hours: by appointment only

SECTION DESCRIPTION
The overall objective is to develop a minimal framework for how the immune system functions, so students will have the basis, using the information technology available, to integrate the information provided and interpret case studies that are related to the immune system.

SECTION OBJECTIVES
By the completion of this module, students will be expected to: (Numbers in brackets refer to sections where the pertinent topic is discussed in the document called Understanding the Immune System: A Framework for First Year Medical Students).

- To describe the evolutionary and functional relationships between the innate defense system and the adaptive immune system (1.3).
- To describe how the main attributes of the adaptive immune system, namely memory, specificity, universality, self-nonself discrimination, and immune class regulation, came to be appreciated (1.4).
- To describe how important these attributes are to the physiology of the immune system, in part through explaining how the failure of some attributes leads to pathology, or creates impediments to achieving therapeutic goals in medicine (1.4.1).
- To be able to list the essential elements of the Clonal Selection Theory (3.2.1).
- To be able to outline evidence for the Clonal Selection Theory (3.2.2/3.2.3).
- To be able to develop a concept map that relates the fundamental aspects of the immune system to the patient problem (VII).

SECTION SCHEDULE
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdiC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED/RECOMMENDED RESOURCES
Understanding the Immune System: A Framework for First Year Medical Students (located on MEdiC) (Required)
Review of Medical Microbiology and Immunology (Lange ... Medical Books) Paperback. by Warren Levinson (Author). 978-0071818117
Immunology Made Ridiculously Simple: Massoud Mahmoudi: 978-o-940780-89-7
Students may access Lippincott’s Illustrated Reviews: Immunology, 2nd Edition through http://thepoint.lww.com

SECTION DELIVERY
This module will be team taught and will utilize a variety of teaching strategies to include lecture, small group work, virtual microscopy, concept mapping, and case work. There will be an integrating clinical case at the end of this module focused on the accumulation of the concepts taught during the module.

Student pre-reading is required in this module. Students are strongly encouraged to come to class prepared to participate in the learning activities.

STUDENT ASSESSMENT
See Student Assessment section on the Microbiology, Immunology and Pathology page.
Pathology Section

SECTION LEAD
Dr. Jay Kalra
Email Address: jay.kalra@usask.ca
Phone Number: 306-655-2152 (Admin Assistant: Edie Thompson – 306-655-0237)
Office Location: 3756A RUH
Office Hours: By appointment only

SECTION DESCRIPTION
This section provides involves the study of the pathogenetic mechanisms and pathology involved in clinical disease processes as applied to patient management. As such, it will provide an overview of the general pathological conditions and principles common to underlying systemic afflictions of the body as applicable to the real life practices of medicine. The role of the laboratory in the day-to-day clinical management of patients in relation to systemic and oral pathologies will be explored. Students will be engaged actively in a variety of instructional experiences that will help interweave the threads of understanding which link the pathology of diseases through multiple disciplines.

SECTION OBJECTIVES
This section will provide a temporal horizontal integration framework of pathology to the various introductory principles of anatomy and physiology in the Principles of Biomedical Sciences course as well as throughout the Foundations in Clinical Sciences courses in the pre-clerkship years and into clerkship and beyond. Detailed learning objectives can be found on One45 for each individual session.

SECTION SCHEDULE
All information relating to this section is available in One45 that can be accessed through the Medical Education Information Center (MEdIC) as well. Please check One45 DAILY to ensure that you have the most current schedule information.

REQUIRED RESOURCES

SECTION DELIVERY
See section delivery on the Microbiology, Immunology and Pathology page.

STUDENT ASSESSMENT
See Student Assessment section on the Microbiology, Immunology and Pathology page.