



# COURSE OUTLINE

## CHMI2220

Prepared: Ann Boyonoski Approved:

<b>Course Code: Title</b>	CHMI2220: CLINICAL CHEMISTRY														
<b>Program Number: Name</b>	3400: COLLAB BSCN														
<b>Department:</b>	BSCN - NURSING														
<b>Semester/Term:</b>	17F														
<b>Course Description:</b>	A course designed for students in nursing to develop an appreciation for the usefulness of the objective data generated by the clinical chemistry laboratory. Students should gain insight into the relationship between various common diseases, the underlying biochemistry and the clinical tests used in their diagnosis and therapeutic monitoring.														
<b>Total Credits:</b>	6														
<b>Hours/Week:</b>	6														
<b>Total Hours:</b>	144														
<b>Prerequisites:</b>	BIOL2105														
<b>This course is a pre-requisite for:</b>	BSCN3005, BSCN3056, BSCN3084, BSCN3206, BSCN3406, NURS3084														
<b>Course Evaluation:</b>	Passing Grade: 60%, C														
<b>Evaluation Process and Grading System:</b>	<table border="1"> <thead> <tr> <th>Evaluation Type</th> <th>Evaluation Weight</th> </tr> </thead> <tbody> <tr> <td>Case study</td> <td>10%</td> </tr> <tr> <td>Final Exam</td> <td>35%</td> </tr> <tr> <td>Midterm</td> <td>25%</td> </tr> <tr> <td>Term test 1</td> <td>10%</td> </tr> <tr> <td>Term test 2</td> <td>10%</td> </tr> <tr> <td>Term test 3</td> <td>10%</td> </tr> </tbody> </table>	Evaluation Type	Evaluation Weight	Case study	10%	Final Exam	35%	Midterm	25%	Term test 1	10%	Term test 2	10%	Term test 3	10%
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<b>Course Outcomes and Learning Objectives:</b>	<p><b>Course Outcome 1.</b></p> <p>Introduction to Clinical Chemistry and Evidence-based Laboratory Medicine</p>														

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### **Learning Objectives 1.**

Outline the factors involved in acquiring objective data  
Describe and employ the statistical techniques used to ensure quality control  
Discuss the role of the laboratory in effective patient care  
Explain and demonstrate the factors used in assessing biochemical data  
Discuss the role of the laboratory in therapy and evaluation

### **Course Outcome 2.**

Basic Biochemistry and Techniques

### **Learning Objectives 2.**

List the major categories of organic molecules in the human body.  
Describe the structure and function of the macromolecules  
Demonstrate an understanding of the most common techniques utilized by the laboratory

### **Course Outcome 3.**

Metabolic Aspects of Malignant Disease

### **Learning Objectives 3.**

Describe the role of membrane proteins in the transport of molecules in and out of cells as well as receptors for regulation extracellular molecules such as hormones.  
Review the general pathophysiology of cellular changes  
Describe the pathophysiological changes occurring in paraneoplastic endocrine syndromes  
Discuss the biochemical changes that can be detected in malignant endocrine syndromes  
Discuss the presence and detection of tumour markers as a means of diagnosing a variety of malignant conditions

### **Course Outcome 4.**



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Renal Management of Fluid, Electrolyte, Acid, and Base Balance

### **Learning Objectives 4.**

Discuss the homeostasis of water and sodium and the consequences of breakdown in this system

Outline and discuss the laboratory testing employed in the assessment of sodium and water excess and depletion

Discuss the homeostasis of potassium and the consequences of breakdown in this system

Outline and discuss the laboratory testing employed in the assessment of potassium excess and depletion

Discuss the homeostasis of calcium, phosphate, and magnesium and the consequences of breakdown in this system

Outline and discuss the laboratory testing employed in the assessment of calcium, phosphate, and magnesium

Discuss the buffering of solutions in the human body

Describe the tests employed in assessing the acid/base status of a patient

Outline the common tests in the biochemical investigation of renal function

Determine the effect of a variety of renal disorders on the maintenance of fluid, electrolyte, acid, base balance

### **Course Outcome 5.**

Endocrine Function and Dysfunction

### **Learning Objectives 5.**

Review and discuss the structure and function of the endocrine system

Discuss special considerations in diagnosing endocrine disorders

Examine in detail conditions and biochemical tests involving the hypothalamus and pituitary gland

Examine in detail conditions and biochemical tests involving the thyroid gland

Examine in detail conditions and biochemical tests involving the adrenal glands

### **Course Outcome 6.**



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Lipids, Diagnostic Enzymes, and Cardiovascular Disease

### **Learning Objectives 6.**

Discuss the importance of plasma protein homeostasis and the biochemical means by which it can be evaluated

Examine in detail a variety of plasma proteins for function, diagnostic, and pathophysiological considerations

Describe the major types of plasma lipids, their sources, metabolism, and physiological role  
Examine the diagnostic potential of plasma lipids and plasma enzymes in cardiovascular disease

Discuss the laboratory involvement in the detection and monitoring of haemoglobin deficiencies, porphyrias, and iron deficiencies.

### **Course Outcome 7.**

Metabolic Disorders and Nutrition

### **Learning Objectives 7.**

Describe the various metabolic pathways

Identify the nutrients associated with human nutritional requirements and manifestations associated with their deficiency and/or toxicity

Describe the laboratory measurement of the various nutrients

Examine the complex fashion in which carbohydrates are processed and utilized in the human body

Describe the laboratory measurement for glucose concentration

Discuss laboratory involvement in the diagnosis, management, and treatment of diabetes

Examine the metabolic complications of diabetes and related comorbidities

Discuss the root cause of a variety of inherited metabolic disorders

### **Course Outcome 8.**

Gastrointestinal, Hepatic, and Biliary Considerations



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### **Learning Objectives 8.**

Describe the common biochemical tests used in the investigation of gastric disorders  
Describe the common biochemical tests used in the investigation of pancreatic disorders  
Describe the common biochemical tests used in the investigation of enteric disorders  
Describe the biochemical and physiological impact of a variety of gastric, pancreatic and enteric disorders  
Describe the most common disease processes affecting the liver  
Discuss the potential for icterus and bilirubin measurements as a diagnostic indicator of liver disorder  
List and describe the tests most commonly utilized in the biochemical assessment of liver function  
Describe the biochemical impact of a variety of biliary tract/liver dysfunctions

### **Course Outcome 9.**

Musculoskeletal and Nervous System Disorders

### **Learning Objectives 9.**

Discuss the relevant pathophysiology underlying a variety of metabolic bone diseases and articular diseases  
Describe the relevant biochemical indicators of bone and arthritic conditions and the usefulness of  
Discuss the relevant pathophysiology underlying a variety of muscle diseases  
Describe the relevant biochemical indicators of muscle conditions and the usefulness of the clinical lab in the diagnosis of these conditions  
Discuss the relevant pathophysiology underlying a variety of nervous system disorders  
Discuss the biochemical investigations that are commonly employed in the detection and management of a variety of nervous system disorders

**Date:**

Wednesday, August 30, 2017

Please refer to the course outline addendum on the Learning Management System for further information.