

**Dalhousie University  
Faculty of Medicine/ Department of Pathology & Laboratory Medicine**

**Course codes: PATHOLOGY 5013/ BIOCHEMISTRY 5813/ 4813**

**Credit hours: 3 Title: Biochemistry of Clinical Disorders**

**Autumn Term 2020**

**Course Description:** This introductory course in Clinical Medical Biochemistry, explains the pathophysiologic principles underlying a wide variety of clinical disorders, the laboratory tests that assist in their diagnosis and some methodologies involved in these tests. It also provides an overview on the principles of laboratory testing in general and the criteria of a clinically valuable test. The course is rich in medical terminology and description of clinical cases. The clinical disorders that are addressed in this course include those of the kidney, liver, heart, gastrointestinal tract, adrenal as well as other main endocrine and some metabolic disorders. Drugs of abuse, therapeutic drug monitoring and trace metals are also amongst the topics taught here.

**Course Pre-requisites:** (For 4813) BIOC 3300 and BIOC 3400 and BIOC 3700 or consent of instructor.

**Time and Place:** Pre-COVID timeslot:  
Monday, Wednesday, Friday  
8:35 a.m. - 9:25 a.m  
Teaching will be a combination of asynchronous lectures (Brightspace) and synchronous sessions.

**Course Coordinator:** Dr. Andrea Thoni Room 661 D MacKenzie building  
tel: 902- 473 6867 [Andrea.Thoni@nshealth.ca](mailto:Andrea.Thoni@nshealth.ca)

**Lecturers:**

Dr. Bassam Nassar [Bassam.Nassar@nshealth.ca](mailto:Bassam.Nassar@nshealth.ca)  
Dr. Andrea Thoni [Andrea.Thoni@nshealth.ca](mailto:Andrea.Thoni@nshealth.ca)  
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Dr. Mohamed Abou El Hassan [Mabulhassan@hotmail.com](mailto:Mabulhassan@hotmail.com)

**Course Learning Outcomes:**

Upon completion of this course, students should be able to:

- Appreciate the criteria of a valuable test from both an analytical and clinical perspective
- Understand the normal physiology of a variety of human systems in state of health.
- Understand the pathophysiology underlying a number of clinical conditions that affect various human systems/organs in states of disease.
- Demonstrate the laboratory tests that can help diagnose and manage these conditions and understand some of the basic methodology behind them.
- Demonstrate the impact of common drugs of abuse and trace metals on human health and realize some of the methods available to measure these.
- Outline some of the common metabolic disorders including those that are inherited and determine their clinical and laboratory diagnostic features.
- Diagnose certain common clinical conditions through case studies, outline their significance and management and appreciate the value of therapeutic drug monitoring.

**Course Schedule:**

Please refer to the specific schedule provided for Autumn 2020.

**Course Assessment:**

Criteria for evaluation of students in this course is as follows:

1. Attendance of Assignment Review/Case Study Sessions: **This constitutes 10% of the final grade.**
2. Regular Assignments: These relate to the lecture topics and are to be handed in as per the schedule provided. **Please see appendix A for dates and times of lectures and assignments.**
3. Student Essays: Topics are chosen by faculty specifically for **post-graduate Students only** and are usually current laboratory issues related to the lecture or course material. Students are to prepare 1500 word essay on the chosen topic. Hand in date to be negotiated, nearer the end of the term.

**\*Assignments (and essay if relevant) constitute 50% of the final grade**

4. Mid-term examination: **This will be on October 30, 2020 8:30-9:30 on Brightspace.**
5. Final examination: **This will be in December during the Dalhousie exam timeframe (TBD).** Refer to the schedule in Brightspace as it becomes available.

**\* Examinations constitute 40% of the final grade (20% for Mid-term and 20% for Final examination).**

### **Course –Specific Policies:**

1. Listening to all of the virtual lectures is expected. Assignments are reflective of the lecture content.
2. Attending all Assignment Review/Case Study sessions and all student presentations is expected. Up to 2% of the final mark may be lost **for each session/presentation** not attended without a valid reason.
3. If absence is required for a valid reason, e-mail notification to the lecturer for that day is required and copied to the course coordinator.
4. Submission of assignments beyond the date specified by the lecturer will result in a deduction of a minimum of 20% of the original mark without warning. **If an assignment is not submitted for a valid reason a new submission date will be considered**

and in the interest of fairness to the other students, it may also require a new assignment (substitution, not in addition) which will have equivalent difficulty, length and value as determined by the appropriate lecturer and course co-ordinator.

5. If an assignment extension is required for valid reasons, written communication must be made with the lecturer in advance of the deadline, denoting reason and additional time required.
6. Lecture slides will be provided in Brightspace.
7. Students are expected to review Dalhousie University policy on plagiarism  
[https://www.dal.ca/dept/university\\_secretariat/academic-integrity/plagiarism-cheating.html](https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating.html)
8. Originality checking software will not be used.

### **Resources and Study Material:**

1. **Main:**
  1. Mandatory: **Faculty lecture notes and handouts.**
  2. Optional: **Clinical Chemistry**  
8<sup>th</sup> Edition, 2016  
William Marshall, Márta Lapsley, Andrew Day,  
Elsevier
2. **Additional:**
  3. **Tietz Fundamentals of Clinical Chemistry**  
8<sup>th</sup> Edition, 2018  
Nader Rifai, Andrea Rita Horvath, Carl Wittwer  
Saunders, Elsevier
  4. **Henry's Clinical Diagnosis and Management by  
Laboratory Methods:**  
23<sup>rd</sup> ed., 2017  
Richard A. McPherson & Matthew Pincus  
Saunders, Elsevier
  5. **Medical and Scientific Textbooks and Journals:**

Chapters, reviews and articles provided or recommended by the lecturer(s)

### **Student Support Resources:**

The following links may be useful if requiring advice on academic support and or fair dealings:

1. General Academic Support – Advising  
Halifax: [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)  
Truro: <https://www.dal.ca/about-dal/agricultural-campus/student-success-centre/academic-support.html>
2. Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/guidelines/fair-dealing-guidelines.html>

### **University Policies, Statements, Guidelines:**

This course is governed by the academic rules and regulations set forth in the University Calendar and the Senate.

<https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog>

### **Academic Integrity**

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (*The Center for Academic Integrity, Duke University, 1999*). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

(read more: [http://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](http://www.dal.ca/dept/university_secretariat/academic-integrity.html))

### **Accessibility**

The Advising and Access Centre and the Student Success Centre (Agricultural Campus) serve as Dalhousie's centres for expertise on student accessibility and accommodation. Our work is governed by Dalhousie's Student Accommodation Policy to best support the needs of Dalhousie students. Our team work with students who request accommodation as a result of: disability, religious obligation, an experienced barrier related to any other characteristic protected under Canadian Human Rights legislation. (read more at: [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html))

### **Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

(read more: [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/student-life-policies/code-of-student-conduct.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/student-life-policies/code-of-student-conduct.html))

### **Diversity and Inclusion – Culture of Respect**

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported.

(read more: <http://www.dal.ca/cultureofrespect.html>)

### **Recognition of Mi'kmaq Territory**

Dalhousie University acknowledges that the University is located on Traditional Mi'kmaq Territory

### **Other Policies**

Important Dates in the Academic Year (including add/drop dates) [http://www.dal.ca/academics/important\\_dates.html](http://www.dal.ca/academics/important_dates.html)

University Grading Practices: Statement of Principles and Procedures

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

Scent-Free Program <http://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

## APPENDIX A - SCHEDULE

| Lectures (Asynchronous) |         |   |              | Assignments Due                   | Case Study Session Synchronous(Teams) | Exam                                      |
|-------------------------|---------|---|--------------|-----------------------------------|---------------------------------------|---|
| WEEK (of)               | Lecture | Title   | Lecturer     |                                   |                                       |   |
| 1<br>Sep 8              | 1       | <b>Introduction &amp; Biochemical Investigations in Clinical Medicine</b> | Elnaei       | Mon Sep 14                        | Wed Sep 23<br>(Elnaei/Beach)          |   |
|                         | 2a      | <b>Water &amp; Electrolytes I</b>   | Beach        | Mon Sep 21                        |                                       |   |
| 2<br>Sep 14             | 2b      | <b>Water &amp; Electrolytes II</b>  | Beach        |                                   |                                       |   |
|                         | 3       | <b>Renal Physiology &amp; Disorders</b>                                   | Thoni        | Mon Sep 28                        | Wed Sep 30                            |   |
|                         | 4       | <b>Acid Base Disorders</b>  | Thoni        |                                   |                                       |   |
| 3<br>Sep 21             | 5       | <b>Clinical Enzymology and Pancreatic Enzymes</b>                         | Lou          | Mon Oct 5<br>(Lou/Abouel-hassan)) | Wed Oct 7<br>(Lou/Abouelhassan)       |   |
|                         | 6       | <b>Liver Function</b>   | Abouelhassan |                                   |                                       |   |
| 4<br>Sep 28             | 7a-b    | <b>Carbohydrate Regulation &amp; Disorders I &amp; II*</b>                | Elnaei       | Tues Oct 13*                      | Wed Oct 14                            |   |
| 5<br>Oct 5              | 8a-b    | <b>Lipid Disorders I &amp; II*</b>  | Nassar       | Mon Oct 19                        | Wed Oct 21                            |   |
| 6<br>Oct 12             | 9       | <b>Cardiovascular Disorders</b>   | Lou          | Mon Oct 26                        | Wed Oct 28                            |   |
| 7<br>Oct 19             | 10      | <b>Hypothalamic/Pituitary Diseases</b>                                    | Nassar       | Mon Nov 2                         | Wed Nov 4                             | Midterm 20% Fri<br>Oct 30<br>Lectures 1-9 |
|                         | 11      | <b>Adrenal Medulla</b>  | Nassar       |                                   |                                       |   |
| 8<br>Oct 26             | 12      | <b>Adrenal Cortex</b>   | Nassar       |                                   |                                       |   |
|                         | 13      | <b>Thyroid</b>  | Elnaei       | Mon Nov 9                         | Wed Nov 25                            |   |
| 9<br>Nov 2              | 14      | <b>Female Reproductive</b>  | Elnaei       |                                   |                                       |   |
|                         | 15      | <b>Male Reproductive</b>  | Elnaei       |                                   |                                       |   |
| 10<br>Nov 9 -13         |         | <b>STUDY BREAK – NO CLASSES</b>   |              |                                   |                                       |   |

|              |    |  |        |                            |                                 |                                     |
|--------------|----|--|--------|----------------------------|---------------------------------|-------------------------------------|
| 11<br>Nov 16 | 16 | <b>Inherited Metabolic Disorders I &amp; II</b>  | Liu    | Mon Nov 23                 | Wed Dec 2                       |                                     |
| 12<br>Nov 23 | 17 | <b>Therapeutic Drug Monitoring</b>               | Lou    | Mon Nov 30<br>(Nassar/Lou) | Mon Dec 7                       |                                     |
|              | 18 | <b>Drugs of Abuse</b>                            | Nassar |                            |                                 |                                     |
| 13<br>Nov 30 | 19 | <b>Trace Metals</b>                              | Beach  | Mon Dec 7                  | Brightspace Discussion<br>Forum |                                     |
|              | 20 | <b>Clinical Chemistry at the Extremes of Age</b> | Beach  |                            |                                 |                                     |
|              |    |  |        |                            |                                 | Final (20%) TBD<br>Lectures 10 - 20 |

Assessment Breakdown: Assignments 50% Attendance for asynchronous and synchronous case studies/ assignments review sessions (10%) Mid term and Final Brightspace Quiz/Exam 40% total (20% each).



