



CAMOSUN COLLEGE
School of Arts & Science
Department of Chemistry & Geoscience

CHEM-251-D01
Immunology
Fall 2020

COURSE OUTLINE

The course description is online @ <http://camosun.ca/learn/calendar/current/web/chem.html>

Ω Please note: This outline will *not* be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

(a) Instructor	Jamie Doran, Ph.D.
(b) Office hours	Mondays 12:30 – 1:20 PM Wednesdays 10:30 – 11:20 AM Wednesdays 4:30 – 5:20 PM Thursdays 2:30 – 3:20 PM Fridays 2:30 – 4:20 PM <i>It may be helpful to make an appointment.</i>
(c) Location	Room 350C, Fisher Building, Lansdowne Campus, Camosun College, 3100 Foul Bay Road, Victoria, BC V8P 5J2 Canada
(d) Phone	250.370.3441(voice-mail available)
(e) E-mail	jdoran@camosun.ca (available evenings and weekends throughout the semester)

2. Intended Learning Outcomes

Upon completion of this course the student will be able to:

1. Evaluate fundamental aspects of the human immune system, and relate these to a wide variety of immunologically based clinical conditions including allergies, transplant rejections, autoimmune diseases, and immunodeficiencies including AIDS.
2. Compare and contrast various types of antibody-based diagnostic tests, and various vaccine formulations.
3. Have hands-on experimental skills required to conduct the most commonly used immunological techniques including enzyme-linked immunosorbent assays (ELISA), latex bead agglutination assays, and Western-blotting detection of antigens.
4. Evaluate experimental design, design control experiments, and interpret data arising from basic immunological technologies.
5. Work in a biosafety level-1 laboratory.
6. Prepare, handle, and store many types of solutions, buffers, reagents, and equipment used in immunological experimentation.

3. Required Materials

(a) Texts

Parham, P. 2015, *The Immune System*. 4th ed. Garland Science, New York.

This **required** textbook can be purchased from the Lansdowne Campus bookstore.

(b) Other

Laboratory Manual, Selected Course Notes and Lecture Slides. 2019 Edition.

This **required** course pack contains the laboratory manual, selected course notes, and lecture slides. It can be purchased from the Lansdowne Campus bookstore.

General Materials and Supplies

Computer Each student is required to have a computer or other device for use in on-line classes and office hours. It is highly recommended that this device be a computer or a tablet fitted with a keyboard. A mobile phone may be used but it is expected that students can work very effectively on-line when participating in term tests and the final exam.

Calculator A basic scientific calculator is *required* at times for work involving experimental procedures and lecture material, and may be required during term tests and the final exam. Each student is *required* to provide her or his own calculator. Cell phone-based, tablet-based, or computer-based calculators are sufficient during this on-line offering of the course. Graphing calculators are not to be used during term tests or the final exam.

4. Course Content and Schedule

Credits	4 credits
In-class workload	6 hours per week in a synchronous offering scheduled by the College There are three 50-min lectures per week (please see below). Term test review periods will be scheduled into appropriate lecture periods prior to each term test. Laboratory periods will be used to discuss experimental techniques in immunology and related immunological subject matter. These are conducted during most of the 2 h & 50 min scheduled laboratory periods. These scheduled times are also used to host two term tests (please see below for the schedule).
Out-of-class workload	6 hours per week
Number of weeks	14 weeks
Pre-requisite	Chem 120 - College Chemistry 1 (grade of C)

Course times and locations

<u>Lectures</u>	Tuesday, 12:30 PM - 1:20 PM on-line Thursday, 12:30 PM - 1:20 PM on-line Friday, 12:30 PM - 1:20 PM on-line
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Laboratory Periods & Term Test Times

Tuesday, 2:30 PM to 5:20 PM on-line

Please refer to the laboratory and term test schedule, below.

Lecture Outline

HISTORICAL PERSPECTIVE

Reading relevant to this initial lecture material is provided in the 'Selected Course Notes' section of the course pack under the heading 'Historical Perspective on the Field of Immunology' (pages 271 to 277). Much of this information is introduced in *The Immune System*, 4th ed. by Peter Parham. However, it is portioned across several of the chapters often appearing in the introductory sections.

- Early historical evidence of immunity in humans
 - Earliest evidence of the phenomenon of 'immunity'
 - Recognition of the four basic tenants of adaptive immunity
- Variolation & the early evidence of vaccination
- Development of Jenner's smallpox vaccine
- Development of the field of immunology
 - Louis Pasteur (1860's-1890's) creates the field of immunology with seminal experiments demonstrating vaccination and acquired immunity in animals and humans.
 - Pasteur and Koch compete to create widely accepted vaccines.
 - Metchnikoff establishes the field of cellular immunology (1880's)
 - Nuttall (1888) & Von Behring (1888-1890's): humoral immunity
 - Wright (1903): synergy of cellular and humoral immunity.
 - Paul Ehrlich (early 1900's-1915): furtherance of understanding.
 - Border (early 1900's): immune responses to non-pathogenic cells
 - Lansteiner (early 1900's): blood group, ABO antigens.
 - Ramon (1928): toxoids (attenuated chemicals) as vaccines
 - Kabat (1930's): isolated immunoglobulins (antibodies) from blood
 - Chase (1940's): demonstrates transfer of cellular immunology
 - (Note the list of Nobel Prize winning immunologists at the end of the selected notes.)

GENERAL ROLE FOR THE IMMUNE SYSTEM IN MAINTAINING BODY INTEGRITY

Reading Chapter 1, sections 1-1, 1-2, 1-5, 1-6, 1-8 & 1-11 to 1-14

- Challenges to health: infectious organisms, cancer, toxins
- Innate immunity 'versus' adaptive immunity
- The lymphatic system (*will be integrated with discussion of innate immunity, below*)
 - Primary and secondary lymphatic tissues
 - Structure and function of the lymphatic system as it relates to immunity
- Primary immune responses vs. secondary immune responses

THE INNATE IMMUNE RESPONSE

Reading Chapter 1, sections 1-3, 1-4 & 1-7

Chapter 2, sections 2-1 to 2-8 & 2-9 to 2-11

Chapter 3, sections 3-1 to 3-21

Chapter 9, sections 9-17, 9-18 & 9-19 (on complement)

Chapter 10, sections 10-1 to 10-3

Selected Course Notes, 'Innate Immunity', pages 278 to 285.

Selected Course Notes. 'Complement and Activation of the Classical & Alternative Pathways', pages 286 to 293.

Browse Chapter 12, sections 12-1 to 12-9 to collect more salient information on NK cells

- General characteristics of nonspecific physical and chemical defenses
 - Physical barriers
 - Skin and mucous membranes
 - Defensive chemicals
 - pH, lysozyme, iron-binding compounds, defensins, & others
 - Natural bacterial flora and microbial antagonism
- White blood cells (leukocytes) involved in innate immunity
 - Phagocytic cell types: monocytes & macrophage, neutrophils, dendritic cells, Langerhans cells
 - Nonphagocytic leukocytes: eosinophils, natural killer cells
 - Inflammatory leukocytes: mast cells, basophils
 - Lymphocytes: B-cells and T-cells
 - Origins of myeloid and lymphoid cell lines
- The innate, acute, inflammatory responses
 - Constriction and local dilation of vessels
 - Roles for cells and soluble factors from the blood
 - Margination, extravasation (diapedesis), chemotaxis
 - Mast cell activity, soluble mediators

- The process of phagocytosis by macrophage
 - Antigen presentation links innate immunity with adaptive immunity
 - Oxygen-dependent and oxygen-independent killing mechanisms
 - Microbial strategies for the prevention of phagocytic killing
- Cytokines, an Introduction.
 - General nature and characteristics
 - Autocrine and paracrine functions
 - Classic characteristics: pleiotrophy, redundancy, synergy, antagonism
- Cytokines, other humoral factors, and cell receptors involved in innate immunity
 - Broad picture of cytokine-mediated immunoregulation
 - Chemokines
 - Interferons α & β (type 1 IFN)
 - Toll-like receptors & other pattern recognition receptors (PRRs)
 - C-reactive protein & other acute phase proteins
 - Adhesion molecules
- Complement
 - Classical complement pathway
 - Alternative complement pathway
 - Lectin-mediated complement activation pathway
 - Roles of products of complement activation and other acute phase proteins in the inflammatory response and other aspects of immunity.
- Natural killer (NK) cells
 - Roles in innate immunity
 - Cytotoxic mechanisms
 - Roles in conjunction with adaptive immunity

GENERAL NATURE OF ANTIBODIES AND ANTIGENS

This information will be introduced early in the course in support of laboratory experiments.

- Basic nature of antibodies
- Antigens, immunogens, and haptens
 - Epitopes (antigenic determinants)
 - Characteristics and properties of immunogens
 - Experimental conditions that affect the immunogenicity of immunogens
 - Vaccination conditions that affect the immunogenicity of immunogens

ANTIBODIES - STRUCTURE & DIVERSITY

Some of this information will be introduced early in the course in support of laboratory experiments.

Reading Chapter 4, sections 4-1 to 4-16

Browse Chapter 4, section 4-17

- Antibodies
 - Structure and function of a prototypic, divalent Ab molecule
 - ◊ Fab and Fc fragments
 - ◊ Globular constant domains
 - ◊ Variable and hypervariable (CDR) regions
 - Isotypes (classes) of antibodies
 - ◊ Classes of heavy and light chains
 - ◊ Immunological characteristics and functions
 - Idiotypes
- Genetics of antibody diversity & antibody production by B-cells
 - Multi-gene organization of immunoglobulin genes
 - Variable region gene rearrangements
 - Generation of antibody diversity
 - Class switching
- Monoclonal Antibodies (MAbs) (*material presented in conjunction with MAb labs*)
 - Technical means of producing MAbs
 - Roles of MAbs as drugs
 - Roles of MAbs in drug targeting
 - Roles of MAbs in diagnostics

B-CELL ACTIVATION & ANTIBODY EFFECTOR FUNCTIONS

Reading Chapter 6, Introduction, and sections 6-1, 6-2, 6-4, 6-5, & 6-9 to 6-16

Chapter 9, sections 9-1, 9-3, 9-4 to 9-6, & 9-8 to 9-16

Chapter 10, sections 10-12 to 10-15

Browse Chapter 9, sections 9-2, 9-7 & 9-21 to 9-24

- Development & processing of B-cells
- Antibody production by B-cells
 - Clonal selection and antibody synthesis
 - B-cell receptors and antigen binding
 - B-cell activation and maturation
 - Plasma cells
 - Memory B-cells
 - Affinity maturation
 - Relationship of affinity maturation to class switching
 - Relationship of affinity maturation to memory B-cells
- Antibody effector functions
 - Roles as adaptor molecules
 - Roles specific to classes (isotypes) of antibodies
- Antibody interactions with Fc receptors on macrophage, mast cells, basophils, eosinophils, and natural killer (NK) cells.
 - ADCC (antibody-dependent cell-mediated cytotoxicity)
- B-cell Receptors & cell adhesion molecules
- Role of CD4 Helper T_H2-cells in antibody production
- Role of CD4 Helper T_H2 -cells in CD4 B-cell activation
- T-independent B-cell antigens
- Role of the lymphatic system
- The role of T-helper cell - B-cell interactions
 - Affinity maturation and isotype switching
 - Prevention of harmful effects of affinity maturation

T-CELL ANTIGEN RECOGNITION AND ACTIVATION, AND T-CELL MEDIATED IMMUNITY

Reading Chapter 5, Introduction, and sections 5-1, 5-2, 5-4, 5-6 to 5-11 & 5-13 to 5-23

Chapter 7, Introduction, and sections 7-1, 7-8 & 7-10 to 7-14

Chapter 8, Introduction, and sections 8-1 to 8-3, 8-8 to 8-11, and 8-14 to 20

Chapter 10, sections 10-4 to 10-11 & 10-16

Browse Chapter 5, sections 5-3, 5-5 & 5-12

Chapter 7, sections 7-2, 7-3, 7-5 & 7-9

Chapter 8, sections 8-4, 8-5 (note phase one trial), 8-6, 8-7 & 8-13

Chapter 12 sections 12-10 to 12-16

Chapter 13 section 6 (super-antigens)

- Development and processing of T-cells.
- T-cell receptors
 - T-cell receptor diversity
 - Role of $\alpha\beta$ receptors
 - role of $\gamma\delta$ receptors
- MHC Presentation and T-cell Surface Proteins CD4 and CD8
 - Endogenous antigen processing
 - Exogenous antigen processing
 - Role of CD4 in recognition of MHC II
 - Role of CD8 in recognition of MHC I
 - 'T-cell restriction'
 - MHC polymorphism
- CD4 & CD8 T-cell subclasses
 - Cytotoxic T-cells, helper T-cells, regulatory T-cells
 - Clonal selection applies to cytotoxic T-cells
 - MHC I presentation & Tc-cell Activation
 - MHC II presentation & APC-cell Activation
 - Roles of antigen-presenting cells (APC's)
 - Macrophage
 - Dendritic cells
 - Langerhans cells
 - B-cells
- Adhesion molecules: CD molecules, selectins, integrins, toll-like receptors
- Role of CD4 Helper T_H1-cells in CD8 cytotoxic T-cell (Tc) activation
- Activity of cytotoxic CD8 T-cells
- Role of CD4 Helper T-cells in CD8 cytotoxic macrophage activation
- Role of CD4 Helper T_H2 -cells in CD4 B-cell activation

- T_H1 vs. T_H2 Responses
 - Humoral vs. cellular immune responses
 - Cytokine profiles
 - Polarization (humoral vs. cellular) of immune responses
 - Functions of cytokines in mediating polarization
- Activity of cytotoxic CD8 T-cells

IMMUNODEFICIENCY

Reading Chapter 13, sections 13-8 to 13-16 & 13-20 to 13-22

Selected Course Notes, 'Primary and Secondary Immunodeficiencies', pages 304 to 308

Read Selectively Chapter 13, sections 13-17 to 13-19, 13-21 & 13-23 to 13-25

- Primary immunodeficiencies
- Secondary immunodeficiencies including AIDS

HYPERSENSITIVITY (Allergy)

Reading Chapter 14, sections 14-1 to 14-6, 14-8 to 14-13

Selected Course Notes, 'The Hygiene Hypothesis', pages 294 to 295

Browse Chapter 14, section 14-7

- The nature of hypersensitivity and allergens
- Types of hypersensitivity
 - Immediate-type hypersensitivity
 - Type 1 - Anaphylactic hypersensitivity
 - ◇ Systemic anaphylaxis
 - ◇ Localized anaphylaxis
 - Type 2 - Antibody-dependent cytotoxicity hypersensitivity
 - Type 3 - Complex-mediated hypersensitivity
 - ◇ Systemic
 - ◇ Localized
 - Delayed type hypersensitivity
 - Type 4 - Cell-mediated hypersensitivity
- Allergy rates and the hygiene hypothesis

IMMUNOTOLERANCE

- Significance of immunotolerance to health
- Mechanisms of immunotolerance
 - Self-tolerance
 - Immunological silence
 - ◇ Central tolerance
 - ◇ Peripheral tolerance
 - ◇ Cross-tolerance
 - Immunological ignorance
 - Functional tolerance

AUTOIMMUNITY

Reading Chapter 16, sections 16-1, 16-2, 16-5, 16-6, 16-8 to 16-10, 16-12 to 16-14 & 16-16 to 16-18

Selected Course Notes, 'Characteristics of Some Autoimmune Diseases', pages 296 to 303

Browse Chapter 16, sections 16-3, 16-4, 16-7 & 16-11

- Major sources of autoimmunity
- Autoimmune diseases
 - Tissue-specific diseases
 - Aspermatogenesis
 - Sympathetic ophthalmia
 - Hashimoto's thyroiditis
 - Insulin-dependent diabetes
 - Autoimmune anemias
 - Pernicious anemia
 - Hemolytic anemias
 - Goodpasture's syndrome
 - Graves' disease
 - Systemic autoimmune diseases
 - SLE (Lupus)
 - MS
 - Rheumatoid arthritis

TRANSPLANTATION IMMUNOLOGY

Reading selectively Chapter 15, sections 15-1 to 15-14 & 15-18 & 15-23

Browse Chapter 15, sections 15-15 to 15-17 & 15-24 to 15-27

- Autograft, isograft, allograft, xenograft
- Privileged sites & privileged tissues
- Graft rejection
 - Hyperactive rejection
 - Acute rejection
 - First-set rejection
 - Second-set rejection
 - Chronic rejection
- Prevention of rejection
 - Tissue typing
 - Immunosuppressive agents
- Clinical transplantation
 - Current status
 - Graft vs. host reaction
- Acquired immunotolerance
 - Low-zone tolerance
 - High-zone tolerance
 - Immunotolerance created by certain immunization regimes
 - Natural acquisition of 'immunotolerance' in people
- Blood Group Antigens
 - Rh antigens and fetal hemolytic disease
 - ABO antigens and compatible blood donors

VACCINES

Reading Chapter 11, sections 11-1 to 11-11 & 11-14 to 11-28.

Browse Chapter 11, sections 11-12 & 11-13

- Needs, benefits, and potential risks
- Type of vaccines
 - Killed or otherwise inactivated vaccines
 - Live attenuated vaccines
 - Subunit vaccines
 - Purified biomolecules
 - Recombinant vaccines
 - Peptide vaccines
 - DNA, RNA, mRNA vaccines
 - Heterologous vaccines

CANCER IMMUNOLOGY

Reading Chapter 17, sections 17-1 to 17-11 & 17-17

Browse Chapter 17, sections 17-12 to 17-16

- Tumour-Specific transplantation antigens
 - Viral antigens
 - Chemically induced tumour antigens
- Tumour-associated transplantation antigens
 - Carcinofoetal antigens
 - Embryonic antigens
 - Alpha-feto protein antigen
- Immune response to tumours
- Cancer immunotherapy
 - Cytokine therapy
 - Interferon therapy
 - Tumour necrosis factor therapy
 - Monoclonal antibody-based therapies
 - Anti-cancer vaccines

Additional laboratory-lecture topics in Immuno-Diagnostic Formats:

- *Immunofiltration assays*
- *Immunochromatographic assays*
- *Immuno-electron microscopy*
- *Immuno-fluorescence microscopy*

Laboratory & Term Test Schedule

Please thoroughly read the introductory material and experimental protocol(s). Please make a flow chart for each experiment & complete the pre-lab questions.

Tuesday, September 8th

- ◇ General nature of antibodies and antigens
- ◇ The nature of precipitin reactions
- ◇ Gel Immunodiffusion and the Identification of Antigens by Precipitin Reactions

Tuesday, September 15th

- ◇ The nature of antibodies and antigens (continued)
- ◇ The nature of agglutination reactions
- ◇ Experiment 1. The Ouchterlony Reaction - Discussion
- ◇ Experiment 2. The Radial Immunodiffusion (RID) Assay - Discussion

Tuesday, September 22nd

- ◇ The nature of antibodies and antigens (continued)
- ◇ Experiment 3. Identification of *Aeromonas salmonicida* by Latex Bead Agglutination Assay - Discussion

Tuesday, September 29th

- ◇ Principles of ELISA
- ◇ Experiment 4. Detection of *Aeromonas salmonicida* Antigens, and Determination of Anti-*A. salmonicida* Polyclonal Antibody Titer Using an Indirect ELISA - Discussion and interpretation of results

Tuesday, October 6th

- ◇ Experiment 5. Western Blotting Analysis of *Aeromonas salmonicida* Antigens (Part 1) – Discussion
- ◇ The Basis of Western Blotting for the Detection of Specific Antigens
- ◇ The Principles of SDS-Polyacrylamide Gel Electrophoresis for Separation of Antigens

Tuesday, October 13th **Term Test 1 2:30 PM to 4:20 PM on-line**

Tuesday, October 20th

- ◇ Experiment 5. Western Blotting Analysis of *Aeromonas salmonicida* Antigen (Part 2) - Discussion
- ◇ Electrophoretic transfer of proteins onto nitrocellulose
- ◇ The western blotting technique
- ◇ Antigen detection and characterization by western blotting

Tuesday, October 27th

- ◇ Experiment 6. Propagation of CHO Cells in Tissue Culture - Discussion
- ◇ The use of a laminar flow hood and a biosafety hood for sterile tissue culture work
- ◇ Techniques for the propagation of tissue cultures

Tuesday, November 3rd

- ◇ Experiment 7. ELISA Detection of Hsp70 Expression in CHO Cells Treated with Heat or Oxidative Stress
- ◇ Conducting an ELISA for Hsp70 – Discussion and interpretation of results

Tuesday, November 10th

- ◇ Experiment 10. Monoclonal Antibody Production and Characterization – Discussion
- ◇ Techniques for creating hybridomas for producing monoclonal antibodies (MAB's)
- ◇ Propagation of monoclonal antibody producing hybridoma cell tissue cultures

Tuesday, November 17th. **Term Test 2 2:30 PM to 4:20 PM on-line**

Tuesday, November 24th

- ◇ The basis of immunochromatography diagnostic tests
- ◇ Experiment 10. (Continued) Immunochromatography Isotyping of the Monoclonal Antibodies (MAB's) in the Hybridoma Cell Tissue Culture Supernatants – Discussion
- ◇ The basis of immunofiltration diagnostic tests

Tuesday, December 1st

- ◇ Comparison of Immunodiagnostic techniques for lab-based, field-based, and OTC formats

Tuesday, December 8th

◇ Final exam preparations

The date and time of the on-line final exam will be published by the College during the semester.

5. Basis of Student Assessment (Weighting)

(a) Tests

Term Test #1

This test covers relevant material from approximately the first third of the course, including the laboratory component. The delineation of material students are responsible for will be provided in class about one week before the date of the test. This is a 110 min. test that will be written on Tuesday, October 13th from 2:30 PM to 4:20 PM on-line. The results of this test contribute to **20%** of the final grade.

Term Test #2

This test covers relevant material from approximately the second third of the course, including the laboratory component. The delineation of material students are responsible for on this test will be provided in class about one week before the date of the exam. This is a 110 min. test that will be written on Tuesday, November 17th from 2:30 PM to 4:20 PM on-line. The results of this test contribute to **20%** of the final grade.

If either of the term tests is missed due to illness, or other justifiable reason, with supporting documentation the percentage value of that term exam (25%) will be added to the percentage value of the final exam.

(b) Exams

Final Exam

The final exam is a comprehensive exam that includes components from the laboratory section of the course. The value this exam contributes to the final grade is **35%**. The date and time of the on-line final exam will be published by the College during the Fall Semester. *(Please note that neither the exam time nor the final exam date **will not** be changed by the college to accommodate vacation plans.)*

Attendance at the final exam is mandatory. Appropriate documentation must accompany any explanation for absence if an incomplete grade (I grade) is warranted for medical or other justifiable reason.

(c) Other

Laboratory Experiments

Attendance in the lab periods is mandatory. Participation and pre-lab assignments including flow charts contribute **5%** to the final grade.

Students are responsible for understanding the principles, technical bases, and the nature of the results of each experiment. These aspects of the laboratory work will be subject to examination on the term tests and the final exam.

On-line lecture attendance and participation contributes **20%** to the final grade.

6. Grading System

(If any changes are made to this part, then the Approved Course description must also be changed and sent through the approval process.)

(Mark with "X" in box below to show appropriate approved grading system – see last page of this template.)

Standard Grading System (GPA)

Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course

Please refer to descriptions of the required textbook, and required course packages, in Section 3, above.

Within D2L are tutorials that provide instruction on the use of Brightspace and Blackboard Collaborate Ultra.

8. College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @

<http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non-GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum, or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum, or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum, or field placement.

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

Academic Honesty

Please become familiar with the School of Arts & Science guide on academic honesty:

<http://camosun.ca/learn/school/arts-science/images/Arts%20and%20Science%20Academic%20Honesty%20Guidelines.pdf>

Based on College policy, the outcome of an incident of academic honesty on an evaluation (lab-related submission, term test, exam) is a **failing grade** for that evaluation.

Please Note:

Students may **not** use recording devices without the prior permission of the instructor or the Centre for Accessible Learning. The instructor's permission is not required when the use of a recording device is sanctioned by the College's Centre for Accessible Learning in order to accommodate a student's disability, *and* when the instructor has been provided with an instructor notification letter which specifies the use of a recording device. Such recordings are for the student's personal use only, and distribution of recorded material is prohibited. Recordings made during the course would include statements, questions and comments made by students in the class, and these are not to be disseminated or repeated in any manner based on the recordings. Otherwise, please have all recording devices turned off and put away while in lectures.