ORIGINAL COURSE IMPLEMENTATION DATE: September 2016

REVISED COURSE IMPLEMENTATION DATE:

COURSE TO BE REVIEWED: (six years after UEC approval) December 2021

Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: : BIOC 402	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: Advanced Metabolism **Course Short Title (if title exceeds 30 characters):**	
Faculty: Faculty of Science	**Department (or program if no department):** Chemistry

Calendar Description:

The course provides a detailed examination of selected primary and secondary metabolic pathways and their relationship to human health and diseased states.

Prerequisites (or NONE):	BIO320/BIOC 320 and 6 credits of 200-level or higher Chemistry.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Equivalent Courses (cannot be taken for additional credit)

Former course code/number:

Cross-listed with:

Equivalent course(s):

Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit

Transfer credit already exists: ☐ Yes ☒ No

Transfer credit requested (OReg to submit to BCCAT):
☐ Yes ☒ No (if yes, fill in transfer credit form)

Resubmit revised outline for articulation: ☐ Yes ☐ No

To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 45

Typical structure of instructional hours:

Lecture hours	33
Seminars/tutorials/workshops	12
Laboratory hours	
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**45**

Special Topics

Will the course be offered with different topics?
☐ Yes ☒ No

If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s) ☐ Yes, no limit

Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 24

Expected frequency of course offerings (every semester, annually, every other year, etc.): annually

Department / Program Head or Director: David Fenske	**Date approved:**	Sept 16, 2015
Faculty Council approval	**Date approved:**	November 6, 2015
Campus-Wide Consultation (CWC)	**Date of posting:**	December 11, 2015
Dean/Associate VP: Lucy Lee	**Date approved:**	November 6, 2015
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	December 18, 2015

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Describe the metabolic pathways associated with primary metabolite synthesis and degradation.
2. Explain how primary metabolic pathways are interconnected.
3. Explain the importance of secondary metabolism and why it differs between species.
4. Discuss the relationship between hormones, metabolism, and human health.
6. Predict the metabolic consequence of a defect in a specific biochemical pathway.
7. Analyze metabolic data sets in the context of human health.
8. Collaborate with a team of other students to analyze metabolic data sets.
9. Communicate conclusions drawn from metabolic data analysis in a written report.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

Lectures, problem sets, group research and presentation assignments

Grading system: Letter Grades: ☒ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☒ No ☐

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Berg et al.	Biochemistry	☒	Freeman	2015
2.	Nelson and Cox	Lehninger Biochemistry	x☐	Freeman	2013
3.	Garrett et al.	Biochemistry	x ☐	Nelson	2013
4.			☐		
5.			☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

Use this section for supplies and materials for all sections of this course.

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	15%	Midterm exam:	25%	Practicum:	%
Quizzes/tests:	%	Lab work:		Field experience:	%	Shop work:	%
Other: Group Project	20%	Other:	%	Other:	%	Total:	100%

Details (if necessary): Team work is evaluated as part of group project and is based upon peer evaluation, team workload plan, and the quality of the final report.

Typical Course Content and Topics

Week 1: Review of the central role of the TCA cycle

Week 2: Amino acid metabolism in plants and microbes

Week 3: Amino acid metabolism in mammals

Week 4: Nucleic acid metabolism

Week 5: Carbohydrate metabolism and human diseases

Week 6: Pentose phosphate pathway and NADPH synthesis

Week 7: Biosynthesis of respiratory and photosynthetic pigments

Week 8 – 10: Secondary metabolism including synthesis and function of vitamins, and selected antibiotic, alkaloid, and terpene synthesis

Week 11: Hormonal integration of human metabolism

Week 12 -13: Composition of blood plasma and urine as an indication of human health