University of Wisconsin-Whitewater

Curriculum Proposal Form #4A

# **Change in an Existing Course**

Type of Action (check all that apply)

Course Revision (*include course description & former and new syllabus)*  Grade Basis

Contact Hour Change and or Credit Change  Repeatability Change

Diversity Option  Other:

General Education Option

area:  **\***

\* Note: For the Gen Ed option, the proposal should address how this course relates to specific core courses, meets the goals of General Education in providing breadth, and incorporates scholarship in the appropriate field relating to women and gender.

**Effective Term**:

**Current Course Number** (*subject area and 3-digit course number*): Biology/Chemistry 456

**Current Course Title**: Biochemistry

**Sponsor(s)**: Christopher Veldkamp and Catherine Chan

**Department(s):** Biological Sciences and Chemistry

**College(s):**

**List all programs that are affected by this change:**

**Chemistry**

**Biological Sciences**

If programs are listed above, will this change affect the Catalog and Advising Reports for those programs? If so, have Form 2's been submitted for each of those programs?

(Form 2 is necessary to provide updates to the Catalog and Advising Reports)

NA  Yes  They will be submitted in the future

Proposal Information: ([***Procedures for form #4A***](http://www.uww.edu/acadaff/ucc/Procedures_form4A.docx))

1. **Detailed explanation of changes** (use FROM/TO format)

***FROM:***

An introduction to the chemistry of biological systems. The chemistry of the major compounds of living organisms, e.g., proteins, carbohydrates, lipids and nucleic acids, are studied. Intermediary metabolism and biological control are emphasized. The course meets for 3 lectures and 1 laboratory session a week.

Prereq: 'C' or better in Biol 120 or Biol 141 (or pass a higher level Biology course) and Chem 252. 4 u.

44 Lab hours 40 lecture hours = 84 contact hours

***TO:***

**The chemistry of biological systems,** **focusing on** **metabolism and biochemical signaling. Three lectures/week. For Chemistry majors (Biochemistry emphasis), Biology majors (allied health focus), and students interested in Biochemistry postgraduate education.**

**Prereq: 'C' or better in Biol 120 or Biol 141 (or equivalent) or instructor consent, both Biol 251 and Biol 253 or Chem 454, and Chem 251. 3 u. 48 lecture hours = 48 contact hours.**

## Justification for action

The Chemistry department is changing its curricular to meet new guidelines issued by the American Chemical Society (ACS). Specifically, we propose to expand the current one semester Biochemistry course (Biol/Chem 456) to two separate courses, Biochemistry of Macromolecules and Biochemistry of Metabolism and Signaling. The Biochemistry of Macromolecules course, Chem 454, explores fundamental biochemistry concepts, and is a required course for all Chemistry majors (pending approval by the College and University Curricular Committees). We propose to re-design Biol/Chem 456 to focus on the biochemistry of metabolism and signaling, and is intended for Chemistry majors with a Biochemistry emphasis, students interested in postgraduate education in Biochemistry (and related fields), and Biology majors with a pre-professional or allied health field focus. The laboratory component of the original Biol/Chem 456 is now proposed as a stand-alone laboratory course (Biol/Chem 458) to enable students to have maximum scheduling flexibility.

1. **Syllabus/outline** (if course revision, include former syllabus and new syllabus)

III. A. Former Biol/Chem 456 syllabus

**Lecture Class Time:** M & W 11:00 AM – 12:15 PM

(January 19, 2010 - May 7, 2010; no classes from March 22 to 26)

**Where:** UH144

**Credits:** 4 credits (including lab)

**Instructor:** Dr. Catherine Chan

Office: 209 Upham Hall

Phone: 472-5133

E-mail: chanc@uww.edu

**Office Hours:** T 12:00 noon – 1:00 PM,

W 12:30 PM – 1:30 PM,

R 10:00 AM – 1:00 PM,

or by appointment.

**Prerequisite:**

Students must have a 'C' or better in Biol 120 or Biol 141 (or pass a higher level Biology course) and Chem 252.

**Course Materials:**

Text – Biochemistry: The Molecular Basis of Life McKee & McKee 3rd edition.

Lecture outlines (Powerpoint slides) are posted on D2L course web site.

Students should provide their own scientific calculators.

**Course objectives:**

Biochemistry is the study of chemical reactions as pertained to biological systems. This is a field of intense research with numerous medical and agricultural applications. One of the main goals of this course is to introduce students to fundamental biochemical concepts, and to help them bridge the gap between chemistry and biology while developing a working vocabulary of biochemistry. Students are expected to keep up with reading and homework assignments, and actively participate in class discussions. The ability to apply concepts introduced in class to solve real life and hypothetical problems is emphasized.

**Tentative schedule:**

Week Chapters Topics

1 (20th Jan) Unit I: Water: The Medium of Life

2 (25th Jan) Ch 3, 4, 17, 18, 19 & 5 Energy (Thermodynamics)

3 (1st Feb) Nucleic Acids

4 (8th Feb) Genetic Information

5 (15th Feb) Protein Synthesis

Amino Acids, Peptides, & Proteins Discussion of primary literature

**(22nd Feb)** **Mid-term** **Exam 1 (Unit I: Ch 3, 4, 17, 18, 19 & 5) 22nd Feb (Mon)**

6 (22nd Feb) Unit II: Enzymes

7 (1st Mar) Ch 6, 7, 8, 9 & 10 Carbohydrates

8 (8th Mar) Carbohydrate Metabolism

9 (15th Mar) Aerobic Metabolism I: The Citric Acid Cycle

Aerobic Metabolism II: Electron Transport & Oxidative Phosphorylation

Discussion of primary literature

**(15th Mar)** **Research paper (draft) due**

**Spring Break (22nd - 26th Mar) - NO CLASSES**

10 (29th Mar) Unit III: Photosynthesis Ch 13, 11, 12, 14 & 15

**(5th Apr)** **Mid-term** **Exam 2 (Unit II: Ch 6, 7, 8, 9 & 10) 5th Apr (Mon)**

11 (5th Apr) Lipids (1st half of Chap 11)

12 (12th Apr) Lipid Metabolism (select topics)

**(14th Apr) Optional: Revised research paper due**

13 (19th Apr) Nitrogen Metabolism I: Synthesis (select topics)

14 (26th Apr) Nitrogen Metabolism II: Degradation (select topics)

Discussion of primary literature

**(28th Apr)**  **Mid-term** **Exam 3 (Unit III: Ch 13, 11, 12, 14 & 15) 28th Apr (Wed)**

15 (3rd May) Unit IV: Membranes (2nd half of Chap 11)

Ch 11 & 16 Integration of Metabolism

**(10th May) Final exam (Comprehensive): May 10th (Mon) 10:00 AM – 12 noon**

**Course policies**:

**A. Attendance**

* Attendance is highly recommended. **There will be important materials presented in lecture that is NOT available from the lecture outline or the text**. If a lecture is missed, it is the student’s responsibility to find out and obtain materials pertaining to what was covered in lecture, including announcement, lecture notes, assignments, etc. Students will NOT be allowed to make-up any quizzes or assignments due to missing classes.
* Please respect your fellow students and the instructor by turning off all communication devices, and refrain from noisy chatter and other disruptive behavior during class time. Disruptive students will be asked to leave the classroom.
* In the event of inclement weather, students are responsible as described in the UWW undergraduate catalog.

**B. Discussions**

* Participation in class discussions promotes active learning and is an integral part of this course. Students are expected to come prepared to be an active participant in class.

**C. Announcements**

- Occasionally, the instructor may provide additional instructions for an upcoming lecture or

assignment shortly prior to class time. These announcements will be posted on the course web site news page and whenever possible, the instructor will also attempt to contact all students in the course via e-mail. It is advised that students regularly check their university issued e-mail accounts (e-mail will only be sent to uww accounts) and/ or the course web site for updates.

**D. Exams**

* The exam schedule is included in this syllabus. Students must take their exams on the scheduled day. Students MUST take the COMPREHENSIVE FINAL EXAM in order to pass the course. THERE WILL BE NO MAKE-UP EXAMS – A missed exam will be recorded as ZERO except for the following reasons:

**(1) Religious Beliefs Accommodation**

Board of Regents policy states that students’ sincerely held religious beliefs shall be reasonably accommodated with respect to scheduling all examinations and other academic requirements. Students must notify the instructor, within the first three weeks of classes of the specific days or dates on which they will request accommodation from an examination or academic requirement. For additional information, please refer to the University Bulletin and the Timetable; “Accommodation of Religious Beliefs”.

**(2) Absence for University Sponsored Events**

University policy adopted by Faculty Senate and the Whitewater Student Government states that students will not be academically penalized for missing classes in order to participate in university-sanctioned events. They will be provided an opportunity to make up any work that is missed; and if class attendance is a requirement, missing a class in order to participate in a university-sponsored event will not be counted as an absence. A university-sanctioned event is defined to be any intercollegiate athletic contest or other such event as determined by the Provost. Activity sponsors are responsible for obtaining the Provost’s prior approval of an event as being university sanctioned and for providing an official list of participants. Students are responsible for notifying their instructors as soon as possible (at least one week in advance) of their participation in such events.

**(3) You are very sick on the day of exam**

Students must contact the instructor PRIOR to class time on/ before the day of the exam AND must present a doctor’s note to the instructor explaining your absence at the beginning of the next class period (or the first session that the student starts attending class again). The doctor's note does not need to include medical details but must specify: (1) The date the student received care in the medical facility (2) The duration in which the student is deemed unfit to attend class. If you are unable to attend class for an extended period of time, please notify the instructor to discuss possible options for making-up missed assignments/ exams.

* If the student meets one of the three criteria given above, at the discretion of the instructor, he/ she may be asked to take the mid-term exam on a different date. Otherwise, the remaining mid-term exams will be averaged to provide a score for the missed exam. A student who misses the final exam with a legitimate reason will be asked to take the final exam on a different day (A different version of the exam may be given at the discretion of the instructor). Otherwise, the student will receive a ZERO for the missed exam.

- You must PROPERLY NOTIFY the instructor of your intent and reason to miss an exam following the procedures outlined above; otherwise your request may not be honored even if your reason is legitimate.

**Grading:**

* Final grade for the entire semester will be based on students’ performance in the following categories:

**(1) Exams**

3 mid-term exams, 80 points each, and 1 comprehensive final exam, 130 points. The comprehensive final exam will contain question(s) pertaining to important concepts (but not experimental details) learned in the lab portion of the course.

**(2) Quizzes & in-class worksheets**

These will be unannounced quizzes and worksheets given during class time throughout the semester, 60 points total. NO make-up will be allowed. Absence policy for quizzes and in-class worksheets is the same as missed exams as stated in a previous section.

**(3) Research paper**

Each student is responsible for an original (cannot be from another class, or this class from a previous semester), short (5 - 7 pages, typed, double-spaced) research paper. Students should find articles from journals, magazines, newspapers and other pertinent sources that are related to the topics we discussed in class. Suggestions for possible topics will be discussed in class. Students who are not sure about the suitability of a particular topic should check with the instructor prior to writing the paper. More details concerning these research papers will be posted on D2L (and discussed in class if necessary). The research paper is worth 60 points.

**(4) Discussions**

You will be graded according to your level of active participation in individual and group class discussions throughout the semester, 30 points total. Note that attendance is NOT the same as active participation. Students who miss lectures frequently or rarely participate in class activities will receive a failing grade in this category.

**(5) Discussion of primary literature**

Students will be assigned to read recent articles on topics we covered in lecture. Students are expected to read them AHEAD of class time so that full participation in in-class discussion is possible. Take-home assignments will be given to test your comprehension of these articles, 30 points total.

**(6) Laboratory**

This course meets once a week for lab (Section 1 meets every Tue afternoon and Section 2 meets every Wed afternoon). Students must perform satisfactorily in the lab portion (earning 70% or above of total lab points) in order to pass the course. See lab syllabus for details on lab policies and scheduled experiments.

- If a student does not agree with the points received for a particular exam or assignment, a written appeal that clearly indicates the reason(s) for disagreement must be submitted by 5 PM the day following the graded exam/ assignment has been returned. The entire exam/ assignment will be re-graded and returned to the student within a week. No appeals will be considered during class time and no verbal explanations will be provided. Excessive/ frivolous requests for re-grading will be penalized 25% of the value of the exam/ assignment.

- Total possible points for the LECTURE portion of the course: [80 x 3 (mid-term exams)] + [130 (final exam)] + [60 (quizzes & in-class worksheets)] + [60 (research paper)] + [30 (primary literature)] + [30 (discussion)] = 550

- Total possible points for the LAB portion of the course: 425 (See lab syllabus for details)

- Final score in the course is determined by the following formula: [(Lecture score/ 550) x 83%] + [(Lab score/ 425) x 17%]

* Percentage scale used for determining grades in this course:

Grade % Course grade

100 – 89.5 A

89.4 – 79.5 B

79.4 – 69.5 C

69.4 – 59.5 D

59.4 – 0 F

This scale will NOT be changed.

- In case a final grade % needs to be rounded off, the following guidelines will be used:

(1) If the second decimal place is 4 or less, the final grade % will be rounded down.

(2) If the second decimal place is 5 or more, the final grade % will be rounded up.

However, the instructor may also choose to take into consideration class participation and civility when rounding off a student's grade %.

**Dropping the course:**

It is the students’ responsibility to obtain, fill out and get the necessary signatures on official drop forms before the deadline.

**Additional notes:**

* The University of Wisconsin-Whitewater is dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all undergraduates and graduate students to familiarize themselves with University policies regarding Special Accommodations, Misconduct, Religious Beliefs Accommodation, Discrimination and Absence for University Sponsored Events. (For details please refer to the Undergraduate and Graduate Timetables; the "Rights and Responsibilities" section of the Undergraduate Bulletin; the Academic Requirements and Policies and the Facilities and Services sections of the Graduate Bulletin; and the "Student Academic Disciplinary Procedures" [UWS Chapter 14]; and the "Student Nonacademic Disciplinary Procedures" [UWS Chapter 17]). These required syllabus contents were agreed upon by the actions of the Whitewater Student Government (S95- 96:09), Academic Staff Assembly, Faculty Senate (FS956-13 and FS989-11), Provost Prior, and Chancellor Greenhill (approved Nov. 17, 1998).
* If any student requires special accommodations, the instructor should be notified as soon as possible.
* **No class materials, including lecture outlines and exam questions/answers, can be posted on non-UWW web site(s) without the written permission of the instructor and the publisher.**

**Academic misconduct:**

Academic misconduct (cheating, copying, and plagiarism) will not be tolerated and will be dealt with according to UWS Chapter 14. The university believes that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin System. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others’ academic endeavors. Students who violate these standards are subject to disciplinary action. UWS Chapter 14 identifies procedures to be followed when a student is accused of academic misconduct. For additional information, please refer to the section in the Student Handbook titled, Student Academic Disciplinary Procedures.

IF YOU CHEAT, YOU WILL FAIL! There are no exceptions or mitigating circumstance.

**New Syllabus**

CHEM/ BIOL 456 BIOCHEMISTRY LABORATORY SYLLABUS

**Class time:** Section 1 - T 2:15 - 5:15 PM, Section 2 - W 2:15 - 5:15 PM.

**Where:** UH 262

**Instructor:** Dr. Catherine Chan

**Office Hours:** T 12:00 noon – 1:00 PM,

W 12:30 PM – 1:30 PM,

R 10:00 AM – 1:00 PM,

or by appointment.

**Lab materials:** All lab related materials will be available on D2L course web site or supplied as handouts during class time.

**Objectives:** The laboratory is an integral part of the course and is designed to illustrate and

complement the concepts introduced in lectures. Commonly used biochemical techniques will

be introduced.

**Important Policies:**

**(i) Attendance**

Students are expected to come to class prepared (read and understand materials for the day prior to coming to class) and remain attentive for the entire class period. This is to ensure that you can complete the assigned experiment during the allotted time and at the same time, do not hinder the progress or jeopardize the safety of other students. Some labs require that you complete a pre-lab worksheet BEFORE coming to class (designed to test your understanding of the experimental scheme; details will be discussed in class). Please have all communication devices turned OFF during class time (Inform the instructor PRIOR to class time if you need an exemption for a particular session; it will be judged on a case-by-case basis at the discretion of the instructor). Occasionally, the instructor may provide additional instructions for an upcoming experiment or assignment prior to class time. These announcements will be posted on the course web site news page and whenever possible, the instructor will also attempt to contact all students in the course via e-mail. It is advised that students regularly check their university issued e-mail accounts (e-mail will only be sent to uww accounts) and/ or the course web site for updates.

**(ii) Missed/ Late Labs**

No make-up labs will be allowed. Students with unexcused absences will not be allowed to use other students' data to complete their lab report or hand in their assignment(s) late, resulting in a score of '0' for ALL the affected assignments. To ensure everyone in class fully understands proper experimental procedures and precautions, students who are more than 5 minutes late for class will not be allowed to conduct the experiment of the day. Unless instructor approval is obtained PRIOR to class time, these cases will be considered as unexcused absences. The policy for justified absences from lab are the same as that for missed exams, as stated in the lecture syllabus. The 3 acceptable reasons for missing/ late labs are: (1) Religious Beliefs Accommodation (2) University Sponsored Events (3) Documented illness/ injury. You must notify the instructor prior to class time of your intent and reason for missing lab following the procedures outlined in the lecture syllabus; otherwise your request may not be honored even if your reason is legitimate.

**(iii) University Policies for justified absences**

The University of Wisconsin-Whitewater is dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding Special Accommodations, Misconduct, Religious Beliefs Accommodation, Discrimination and Absence for University Sponsored Events. (For details please refer to the Undergraduate and Graduate Timetables; the "Rights and Responsibilities" section of the Undergraduate Bulletin; the Academic Requirements and Policies and the Facilities and Services sections of the Graduate Bulletin; and the "Student Academic Disciplinary Procedures" [UWS Chapter 14]; and the "Student Nonacademic Disciplinary Procedures" [UWS Chapter 17]).

**(iv) Dropping the Course**

If you wish to drop the course, it is your responsibility to obtain, fill out, and get the necessary signatures on an official drop form. You must also check out of the laboratory by following the proper lab check-out procedure. **Failure to check out properly will result in a hold in your registration.**

**(v) Academic Misconduct**

The University believes that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin System. The University has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Students who violate these standards are subject to disciplinary action. UWS Chapter 14 identifies procedures to be followed when a student is accused of academic miscount.

In this course you are expected to perform to the utmost of your ability in an honest and sincere manner. Cheating, plagiarism, the use of unauthorized materials or any other form of academic misconduct will result in a severe penalty as permitted in UWS Chapter 14. Any person caught cheating in this course will receive a **failing grade** - **F**. There are no exceptions or mitigating circumstance. **If you cheat, you fail.**

**(vi) Additional Notes**

If there is anyone in the class that requires special accommodations, please see your instructor immediately. If your health condition (e.g. pregnant, etc.) prevents you from doing an experiment, you should also inform your instructor.

While the laboratory is generally a safe place to explore scientific principles and phenomena, there are things (equipment, reagents, etc) that can cause injury when misused. For this reason, it is important to be fully alert and focused when in the laboratory. If you attend a laboratory session and you fail to follow generally laboratory safety practices and procedures, disregard the written and/or verbal instructions associated with the lab, or are otherwise perceived to be a risk to yourself or others, you will be asked to leave the lab and will receive a ‘0’ for the day’s assignment(s).

**Evaluation of Student Performance in Lab:**

(a) Lab reports and pre-lab worksheets: The semester consists of a series of 5 experiments, and each experiment has an associated lab report (Lab reports 1 - 5). These lab reports are usually due 1 week after the conclusion of each experiment (Due dates are listed in the lab schedule below. **Note that the due date for Lab Report 3 is 4th/ 5th May**). Most lab sessions have pre-lab worksheets that need to be completed and handed in at the BEGINNING of the appropriate class period. Although these worksheets do not carry any points, failure to complete or hand in these worksheets will result in a 10 point deduction for each occurrence. No late assignments will be accepted - They must be handed in at the BEGINNING of the appropriate class period. If you do not agree with the grading of an assignment, please follow the procedure outlined in the lecture syllabus for re-grading. No verbal appeal will be considered.

(b) Lab performance and participation: Students who routinely do not come to class prepared and ready to participate in the day's experiment and discussion (or otherwise not engaged in class activities), and those who have bad lab habits (e.g. failure to clean up or follow safety procedures) will be penalized in this category. All students are also responsible for evaluating the performance of their lab group members, and the instructor may also take into account the result of the peer evaluation when assigning the lab performance score. 50 points total.

Total possible points for the lab: [100 x 3 (Lab reports 1, 2 & 3)] + [75 (Lab report 4)] + [50 (Lab report 5)] + [50 (Lab performance)] = 475

Students must perform satisfactorily in the lab portion (70% or above, or 332.5 points or more) to pass the entire course.

IF YOU FAIL THE LAB PORTION, YOU FAIL THE ENTIRE COURSE.

**TENTATIVE LAB SCHEDULE**

|  |  |  |
| --- | --- | --- |
| **Week (Date)** | **Experiment #**  **(# Points for lab report)** | **Experiment name (Lab report due date)** |
| 1 (Jan 19/ 20) | **---** | NO LAB |
| 2 (Jan 26/ 27) | **---** | NO LAB |
| 3 (Feb 2/ 3) | Expt 1 **(100)** | Lab check-in  Polyacrylamide gel electrophoresis I: Preparation of electrophoresis samples and polyacrylamide gels |
| 4 (Feb 9/ 10) | Expt 1 | Polyacrylamide gel electrophoresis II: Electrophoresis |
| 5 (Feb 16/ 17) | Expt 1 & Expt 2 **(100)** | Polyacrylamide gel electrophoresis III: Documentation of result **(Lab report 1 due Feb 23/ 24)**  Protein purification I: General preparation |
| 6 (Feb 23/ 24) | Expt 1 | Protein purification II: Column chromatography |
| 7 (Mar 2/ 3) | Expt 2 | Protein purification III: Preparation of electrophoresis samples and polyacrylamide gels |
| 8 (Mar 9/ 10) | Expt 2 | Protein purification IV: Electrophoresis of chromatography fractions and immobilization onto a membrane |
| 9 (Mar 16/ 17) | Expt 2 & Expt 3 **(100)** | Protein purification V: Detection of protein of interest via Western blotting and documentation of electrophoresis result  **(Lab report 2 due Mar 30/ 31)**  Microarray I: Experimental design and general preparation |
| **Mar 23/ 24** | **---** | **SPRING BREAK** |
| 10 (Mar 30/ 31) | Expt 3 | Microarray II: Hybridization  **(Lab report 3 due May 4/ 5)** |
| 11 (Apr 6/ 7) | Expt 4 **(75)** | Enzyme assay I: General preparation |
| 12 (Apr 13/ 14) | Expt 4 | Enzyme assay II: β-galactosidase enzyme assay  **(Lab report 4 due Apr 20/ 21)** |
| 13 (Apr 20/ 21) | Expt 5 **(50)** | Benedict's test for various sugars  **(Lab report 5 due Apr 27/ 28)** |
| 14 (Apr 27/ 28) | **---** | Group work on lab report 3 |
| 15 (May 4/ 5) | **---** | Lab check-out  **Lab report 3 due** |

III. B. New Biol/Chem 456 syllabus (Major changes in course content highlighted in *italics*)

**Biochemistry of Metabolism and Signaling (BIOL/CHEM 456)**

**Instructor**: Dr. Catherine Chan/ Dr. Christopher Veldkamp

**Office**: Upham Hall 209/Upham Hall 257

**Phone**: 262-472-5133/262-472-5267

**E-mail**: chanc@uww.edu/ veldkamc@uww.edu

**Class Time:** M & W 11:00 AM – 12:15 PM

**Where:** UH144

**Credits:** 3

**Prerequisite:**

Prereq: 'C' or better in Biol 120 or Biol 141 (or equivalent) or instructor consent, *Biol 251 and Biol 253 or Chem 454*, and *Chem 251*.

**Course Materials:**

*Text – Fundamentals of Biochemistry: Life at the Molecular Level*

*Voet, Voet & Pratt 4th edition.*

Lecture outlines (Powerpoint slides) are posted on D2L course web site.

Students should provide their own scientific calculators.

**Course objectives:**

Biochemistry is the study of chemical reactions as pertained to biological systems. This is a field of intense research with numerous medical and agricultural applications. One of the main goals of this course is to introduce students to fundamental biochemical concepts, and to help them bridge the gap between chemistry and biology while developing a working vocabulary of biochemistry. Students are expected to keep up with reading and homework assignments, and actively participate in class discussions. The ability to apply concepts introduced in class to solve real life and hypothetical problems is emphasized. This course focuses on metabolism and biochemical signaling.

**Tentative schedule:**

|  |  |  |
| --- | --- | --- |
| Week | Chapter | Topic |
| 1 | -- | Review on basic macromolecules |
| 2 | 14,15 | Introduction to Metabolism , Glucose Catabolism |
| 3 | 16 | Glycogen Metabolism and Gluconeogenis |
|  | Exam 1 |  |
| 4 | 17 | Citric Acid Cycle |
| 5 | 18 | Electron Transport and Oxidative Phosphorylation |
| 6 | 19 | Photosynthesis |
|  | Exam 2 |  |
| 7 | 20 | *Lipid Metabolism* |
| 8 | 21 | *Amino Acid and Nucleotide Metabolism* |
| 9 | 22 | *Nucleic Acid Metabolism* |
|  | Exam 3 |  |
| 10 | 13 | *Enzymes in Biochemical Signaling* |
| 11 | 23 | *Biochemical Signaling and the Integration and Regulation of Mammalian Fuel Metabolism* |
| 12 |  | *Additional topics determined by instructor. For example, Heme Metabolism.* |
| 13 |  | *Additional topics determined by instructor. For example, Cytochrome P450’s in detoxification of xenobiotics.* |
|  | Exam 4 |  |
| 14/15 |  | Primary literature/ Review/ Research paper due |
|  | Final Exam |  |

**Course policies**:

**A. Attendance**

* Attendance is highly recommended. **There will be important materials presented in lecture that is NOT available from the lecture outline or the text**. If a lecture is missed, it is the student’s responsibility to find out and obtain materials pertaining to what was covered in lecture, including announcement, lecture notes, assignments, etc. Students will NOT be allowed to make-up any quizzes or assignments due to missing classes.
* Please respect your fellow students and the instructor by turning off all communication devices, and refrain from noisy chatter and other disruptive behavior during class time. Disruptive students will be asked to leave the classroom.
* In the event of inclement weather, students are responsible as described in the UWW undergraduate catalog.

**B. Discussions**

* Participation in class discussions promotes active learning and is an integral part of this course. Students are expected to come prepared to be an active participant in class.

**C. Announcements**

- Occasionally, the instructor may provide additional instructions for an upcoming lecture or

assignment shortly prior to class time. These announcements will be posted on the course web site news page and whenever possible, the instructor will also attempt to contact all students in the course via e-mail. It is advised that students regularly check their university issued e-mail accounts (e-mail will only be sent to uww accounts) and/ or the course web site for updates.

**D. Exams**

* The exam schedule is included in this syllabus. Students must take their exams on the scheduled day. Students MUST take the COMPREHENSIVE FINAL EXAM in order to pass the course. THERE WILL BE NO MAKE-UP EXAMS – A missed exam will be recorded as ZERO except for the following reasons:

**(1) Religious Beliefs Accommodation**

Board of Regents policy states that students’ sincerely held religious beliefs shall be reasonably accommodated with respect to scheduling all examinations and other academic requirements. Students must notify the instructor, within the first three weeks of classes of the specific days or dates on which they will request accommodation from an examination or academic requirement. For additional information, please refer to the University Bulletin and the Timetable; “Accommodation of Religious Beliefs”.

**(2) Absence for University Sponsored Events**

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**(3) You are very sick on the day of exam**

Students must contact the instructor PRIOR to class time on/ before the day of the exam AND must present a doctor’s note to the instructor explaining your absence at the beginning of the next class period (or the first session that the student starts attending class again). The doctor's note does not need to include medical details but must specify: (1) The date the student received care in the medical facility (2) The duration in which the student is deemed unfit to attend class. If you are unable to attend class for an extended period of time, please notify the instructor to discuss possible options for making-up missed assignments/ exams.

* If the student meets one of the three criteria given above, at the discretion of the instructor, he/ she may be asked to take the mid-term exam on a different date. Otherwise, the remaining mid-term exams will be averaged to provide a score for the missed exam. A student who misses the final exam with a legitimate reason will be asked to take the final exam on a different day (A different version of the exam may be given at the discretion of the instructor). Otherwise, the student will receive a ZERO for the missed exam.
* You must PROPERLY NOTIFY the instructor of your intent and reason to miss an exam following the procedures outlined above; otherwise your request may not be honored even if your reason is legitimate.

**Grading:**

* Final grade for the entire semester will be based on students’ performance in the following categories:

**(1) Exams**

4 mid-term exams, 80 points each, and 1 comprehensive final exam, 120 points.

**(2) Quizzes & in-class worksheets**

These will be unannounced quizzes and worksheets given during class time throughout the semester, 60 points total. NO make-up will be allowed. Absence policy for quizzes and in-class worksheets is the same as missed exams as stated in a previous section.

**(3) Research paper**

Each student is responsible for an original (cannot be from another class, or this class from a previous semester), short (5 - 7 pages, typed, double-spaced) research paper. Students should find articles from journals, magazines, newspapers and other pertinent sources that are related to the topics we discussed in class. Suggestions for possible topics will be discussed in class. Students who are not sure about the suitability of a particular topic should check with the instructor prior to writing the paper. More details concerning these research papers will be posted on D2L (and discussed in class if necessary). The research paper is worth 60 points.

**(4) Discussions**

You will be graded according to your level of active participation in individual and group class discussions throughout the semester, 30 points total. Note that attendance is NOT the same as active participation. Students who miss lectures frequently or rarely participate in class activities will receive a failing grade in this category.

**(5) Discussion of primary literature**

Students will be assigned to read recent articles on topics we covered in lecture. Students are expected to read them AHEAD of class time so that full participation in in-class discussion is possible. Take-home assignments will be given to test your comprehension of these articles, 30 points total.

- If a student does not agree with the points received for a particular exam or assignment, a written appeal that clearly indicates the reason(s) for disagreement must be submitted by 5 PM the day following the graded exam/ assignment has been returned. The entire exam/ assignment will be re-graded and returned to the student within a week. No appeals will be considered during class time and no verbal explanations will be provided. Excessive/ frivolous requests for re-grading will be penalized 25% of the value of the exam/ assignment.

- Total possible points for the course: [80 x 4 (mid-term exams)] + [120 (final exam)] + [60 (quizzes & in-class worksheets)] + [60 (research paper)] + [30 (primary literature)] + [30 (discussion)] = 620

* Percentage scale used for determining grades in this course:

Grade % Course grade

100 – 89.5 A

89.4 – 79.5 B

79.4 – 69.5 C

69.4 – 59.5 D

59.4 – 0 F

This scale will NOT be changed.

- In case a final grade % needs to be rounded off, the following guidelines will be used:

(1) If the second decimal place is 4 or less, the final grade % will be rounded down.

(2) If the second decimal place is 5 or more, the final grade % will be rounded up.

However, the instructor may also choose to take into consideration class participation and civility when rounding off a student's grade %.

**Dropping the course:**

It is the students’ responsibility to obtain, fill out and get the necessary signatures on official drop forms before the deadline.

**Additional notes:**

* The University of Wisconsin-Whitewater is dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all undergraduates and graduate students to familiarize themselves with University policies regarding Special Accommodations, Misconduct, Religious Beliefs Accommodation, Discrimination and Absence for University Sponsored Events. (For details please refer to the Undergraduate and Graduate Timetables; the "Rights and Responsibilities" section of the Undergraduate Bulletin; the Academic Requirements and Policies and the Facilities and Services sections of the Graduate Bulletin; and the "Student Academic Disciplinary Procedures" [UWS Chapter 14]; and the "Student Nonacademic Disciplinary Procedures" [UWS Chapter 17]). These required syllabus contents were agreed upon by the actions of the Whitewater Student Government (S95- 96:09), Academic Staff Assembly, Faculty Senate (FS956-13 and FS989-11), Provost Prior, and Chancellor Greenhill (approved Nov. 17, 1998).
* If any student requires special accommodations, the instructor should be notified as soon as possible.
* **No class materials, including lecture outlines and exam questions/answers, can be posted on non-UWW web site(s) without the written permission of the instructor and the publisher.**

**Academic misconduct:**

Academic misconduct (cheating, copying, and plagiarism) will not be tolerated and will be dealt with according to UWS Chapter 14. The university believes that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin System. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others’ academic endeavors. Students who violate these standards are subject to disciplinary action. UWS Chapter 14 identifies procedures to be followed when a student is accused of academic misconduct. For additional information, please refer to the section in the Student Handbook titled, Student Academic Disciplinary Procedures.

IF YOU CHEAT, YOU WILL FAIL! There are no exceptions or mitigating circumstance.