SMC Core Curriculum Course Proposal Form
Fall 2014

Electronically submit this course form and attachments to the Chair of the CCC by October 1. Please submit a separate proposal for each desired learning goal.

1. Name of Proposer: Rebecca Jabbour
2. Email address: rsj2@stmarys-ca.edu
3. Department/Program of Proposer: Biology

4. Name of Department/Program housing the course: Biology
5. Name(s) of Program Director/Department Chair housing the course: Vidya Chandrasekaran

6. Course Acronym, Number and Title: BIOL 080/081 Human Biology
7. Proposal is for All Sections of the course: _yes____
   Proposal is for instructor's section(s) (Engaging the World only): _____
8. Course Prerequisites (if any): none
9. Unit Value of Course: 1.0

10. Mark with an X the Learning Goal for which the course is being proposed. (Please submit a separate proposal for each desired goal.)

Pathways to Knowledge (at most one)
Artistic Understanding – Artistic Analysis only: ____
Artistic Understanding – Creative Practice only: ____
Artistic Understanding – Both Artistic Analysis and Creative Practice: ____
Mathematical Understanding: ____
Scientific Understanding: __X__
Social, Historical, Cultural Understanding: ____
Christian Foundations: ____
Theological Explorations: ____

Engaging the World (as appropriate, generally zero to two)
American Diversity: ____
Common Good: ____
Community Engagement: ____
Global Perspectives: ____

11. Expected Attachments:
    a) Syllabus
    b) Teaching and Learning

Human Biology Lecture/Lab (BIOL 80/81)
Syllabus

Required Texts:
Human Biology, by Sylvia S. Mader and Michael Windelspecht
Lab materials will be distributed in class or posted to Moodle.

Course description:

This course is an introduction to the science of human biology, designed for students who are not majoring in a biological science. It satisfies the Scientific Learning Outcomes of the Mathematical and Scientific Understanding Learning Goal. The course will consider human biology as both a body of knowledge and a process by which we gain understanding of human health, anatomy, physiology, and evolution. It will cover topics such as the chemistry of life, the cell, the systems of the body, human development, inheritance, human evolution, and human ecology. Social and ethical issues, such as those relating to advances in genetics and to threats to the biosphere from humans, will be explored. The class will emphasize the importance for our health of understanding how our bodies function and the importance for our collective future of understanding our relationship with the planet.

This course must be taken concurrently with BIOL 81, a weekly three-hour laboratory that accounts for 25% of the final course grade in BIOL 80.

Learning Outcomes:

1. Demonstrate basic knowledge of the process of science, chemistry, cells, and tissues.
    - This outcome will be assessed primarily through Exam 1.

2. Demonstrate basic knowledge of the organ systems of the human body.
    - This outcome will be assessed primarily through Exams 1 and 2.

3. Demonstrate basic knowledge of human development, genetics, human evolution, and human ecology in the context of the modern world.
    - This outcome will be assessed through Exam 3.

4. Examine social or ethical issues that arise as a result of advances in various fields of human biology and as a result of the impact of humans on the biosphere in which we live.
    - This outcome will be assessed through the Social Issues Paper.

5. Critically evaluate a news report on a topic in human biology, based on your knowledge of the scientific process.
    - This outcome will be assessed through the Human Bio in the News assignment.

6. Experience and explore the process of science through collecting, analyzing, and interpreting empirical data gathered in the lab.
    - This outcome will be assessed through BIOL 81 exercises and lab quizzes.

Basis for Final Grade:

Your grade will be based on:
Exam 1 – 20%
Exam 2 – 20%
Exam 3 – 15%
Social Issues Paper – 10%
Human Bio in the News – 10%
Lab – 25%

Good classroom participation can push up a borderline grade.

E**xams:**

Midterm exams will consist of multiple-choice and written-response questions. Written-response questions are answered with a brief paragraph. Exams will test your knowledge and comprehension of information and concepts presented in lecture and in your textbook.

Social Issues Paper:

During the last two weeks of class, we will focus on the impact of human life on the rest of the planet. You will write a two-page (double-spaced) paper on one particular way human populations or human behaviors threaten the biosphere. Your paper will describe the problem, based on lecture material and your textbook, and will thoughtfully discuss how the problem could be addressed and different perspectives on these proposed solutions. The full assignment will be distributed later in the semester.

Human Bio in the News:

Human biology is in the news every day, mostly with regard to human health. We regularly see stories about health problems in human populations, new discoveries that could improve human health, and social consequences of health, disease, and medicine. We sometimes read about advances in understanding how the human body works and how it evolved. Further, an important topic in the news is how human behavior and population size impacts the rest of life on Earth. It benefits every one of us to be informed about human biology.

In order to encourage you to get in the habit of reading and thinking about human biology in the news, we will begin many class periods with student presentations of human-biology-related news stories, followed by short discussions. For your presentation, you will select a news article on a biological topic from *The New York Times* or *Science News* that you think is interesting. On your scheduled day, you will make a brief presentation to the class about the article you have selected, and you will turn in a short write-up. The full assignment is given on a separate handout.

Lab:

BIOL 80 must be taken concurrently with BIOL 81, Human Biology Laboratory. Your grade in this lab section will constitute 25% of your BIOL 80 course grade. Your lab grade will be based on your performance on lab exercises and quizzes. In lab, you will gain hands-on experience with science as a process. You will explore questions about human biology by collecting, analyzing, and interpreting data. You will also dissect and observe preserved animal specimens in order to gain firsthand appreciation of the anatomy we share with other mammals.

Academic Honor Code:

I expect students to uphold the Academic Honor Code. Academic dishonesty will be reported to the Academic Honor Council. Please refresh your memory of the pledge below and refer to the Student Handbook for details.

As a student member of an academic community based in mutual trust and responsibility, I pledge:
• to do my own work at all times, without giving or receiving inappropriate aid;
• to avoid behaviors that unfairly impede the academic progress of other members of my community; and
• to take reasonable and responsible action in order to uphold my community's academic integrity.

Student Disability Services:

Reasonable and appropriate accommodations for individuals with qualifying disabilities are extended through the office of Student Disability Services. Students with disabilities are encouraged to contact the Student Disability Services office at (925) 631-4358 to set up a confidential appointment to discuss accommodation guidelines and available services. Additional information may be found at the following address on the Saint Mary's website: http://www.stmarys-ca.edu/sds

Human Biology Lecture Schedule

SCHEDULE – Lectures, Readings, and Exams

Week 1

Tues – Lecture 1
Intro to course
Exploring Life, Science, Ethics, and Society
Reading: Ch. 1

Thurs – Lecture 2
Chemistry of Life
Reading: Ch. 2

Week 2

Tues – Lecture 3
Cell Structure and Function
Reading: Ch. 3

Thurs – Lecture 4
Organization and Regulation of Body Systems
Reading: Ch. 4

Week 3

Tues – Lecture 5
Cardiovascular System
Reading: Ch. 5

Thurs – Lecture 6
Blood
Reading: Ch. 6

Week 4

Tues – Lecture 7
Lymphatic and Immune System
Reading: Ch. 7

Thurs – Lecture 8
Digestive System and Nutrition
Reading: Ch. 8

Week 5

Tues – **EXAM 1**
Lectures 1-8

Thurs – Lecture 9
Respiratory System
Reading: Ch. 9

Week 6

Tues – Lecture 10
Urinary System
Reading: Ch. 10

Thurs – Lecture 11
Skeletal System
Reading: Ch. 11

Week 7

Tues – Lecture 12
Muscular System
Reading: Ch. 12

Thurs – Lecture 13
Nervous System
Reading: Ch. 13

Week 8

Tues – Lecture 14
Senses
Reading: Ch. 14

Thurs – HOLIDAY

Human Biology Lecture Schedule

Week 9

Tues – Lecture 15
Endocrine System
Reading: Ch. 15

Thurs – Lecture 16
Reproductive System
Reading: Ch. 16

Week 10

Tues – **EXAM 2**
Lectures 9-16

Thurs – Lecture 17
Human Development and Aging
Reading: Ch. 17

Week 11

Tues – Lecture 18
Patterns of Chromosomal Inheritance
Reading: Ch. 18

Thurs – Lecture 19
Cancer
Reading: Ch. 19

Week 12

Tues – Lecture 20
Patterns of Genetic Inheritance
Reading: Ch. 20

Thurs – Lecture 21
DNA Biology and Technology
Reading: Ch. 21

Week 13

Tues – Lecture 22
Human Evolution
Reading: Ch. 22

Thurs – HOLIDAY

Week 14

Tues – Lecture 23
Global Ecology and Human Interferences
Reading: Ch. 23

Thurs – Lecture 24
Human Population, Planetary Resources, and Conservation
Reading: Ch. 24

EXAM 3
Lectures 17-24

Social Issues Paper due at the time of Exam 3.

Human Biology Lab Schedule

SCHEDULE – Lab Topics

Lab 1

Food Nutrient Analysis
Starch Breakdown

Lab 2

Diffusion/Osmosis Experiments
Microscopy: Observation of Cells and Tissues

Lab 3

Heart Dissection
Pulse and Blood Pressure Tests
Blood Types and Transfusions

Lab 4

Digestive System Dissection
Gastric and Intestinal Enzymes

Lab 5

Respiratory System Dissection
Testing Lung Function

Lab 6

Urinary System Dissection
Urine Examination and Urinalysis

Lab 7

Skeletal System Observation
Muscular System Dissection

Lab 8

Brain Dissection
Testing the Senses and the Cranial Nerves

Lab 9

Reproductive System
Embryology and Fetal Development

Lab 10

Patterns of Inheritance

Lab 11

DNA Structure and Function

Lab 12

Human Evolution – Fossils

Core Curriculum Course Proposal – Fall 2014
Scientific Understanding
Human Biology (BIOL 80/81)

Teaching and Learning

Teaching:

Learning Outcome #1 guidance will be provided by lectures, textbook readings, video clips, student presentations on news items, and discussions that cover important concepts, principles, and theories relating to human anatomy, physiology, disease, inheritance, evolution, and ecology. A more detailed list of topics can be found on the lecture schedule included with the syllabus. This list of topics constitutes a broad overview of the biology of being human. Because many aspects of human biology are shared to a large extent with other mammals, this course more broadly provides a foundation for understanding mammalian biology in general, through the lens of human biology.

Learning Outcome #2 guidance will be provided by BIOL 81 laboratory exercises. Students will spend three hours per week in a laboratory section, where they will engage in science as a process by conducting experiments (including collecting, analyzing, and interpreting empirical data) to enhance their understanding of how the human body functions, varies, and evolves. For example, they will collect and analyze data in order to test hypotheses about the nutrient contents of various foods; how pulse and blood pressure respond to exercise; and the relationship between lactase production and lactose digestion or intolerance.

Learning Outcome #3 guidance will take the form of discussions of current social and ethical issues arising from developments in human biology. Examples of such debates include how to balance the potential benefits and risks of personal genomics, whether it is acceptable to treat diseases with stem cells derived from embryos, and how to slow down growth in the world's population while respecting cultural and religious differences. These topics will be considered as they arise over the course of the semester. Discussions will be based on readings from the textbook, outside sources, and news items presented by students.

Learning:

Achievement of Learning Outcome #1 will be measured using three exams in which students will be asked to demonstrate their understanding of concepts, principles, and theories relevant to human biology. Exams will consist of multiple-choice and written-response questions. Written-response questions will be answered with a brief paragraph, requiring students to demonstrate greater understanding of the material than is required by multiple choice questions.

Achievement of Learning Outcome #2 will be measured through BIOL 81 lab exercises and quizzes that will require students to demonstrate their understanding of the experimental

process (including collecting, analyzing, and interpreting empirical data) and the concepts tested by the experiment.

Achievement of Learning Outcome #3 will be measured by a two-page (double-spaced) Social and Ethical Issues paper. Students will describe a current problem arising from the impact of human behaviors or populations on the biosphere, identify one or more potential solutions, and thoughtfully consider different perspectives on potential solutions.