Appendix C: Reference Syllabi

For users new to the syllabus rubric, we recommend the following norming process:

- score the following six reference syllabi;
- compare your scores with the expert-rated scores (appendix D);
- read the annotated syllabi (Appendix D) carefully to resolve scoring discrepancies.

These six reference syllabi span a range of disciplines and the range of content- to learning-focused syllabi. The syllabi describe the following courses:

- A 1st-year seminar course titled “Fairy Tales in Literary and Popular Culture” (pre- and post-CDI syllabi)
- A 2nd-year biomedical engineering course titled “Biotransport” (pre- and post-CDI syllabi)
- A 2nd-year sociology course titled “Economy & Society” (post-CDI syllabus)
- A 4th-year biology course titled “Cell Mechanisms” (post-CDI syllabus)

FYS 100: Twice-Told Tales: Fairy Tales in Literary and Popular Culture

[Professor Name]
[Office / Phone Number]
[Office Hours]
[Writing Consultants]

Welcome

This fall the "Twice-Told Tales" seminar will focus on a case study of perhaps the most popular fairy tale in the Western canon, "Cinderella," and its variants. We will begin by remembering and retelling the tale, moving from there into a close study of some of the oldest, most popular and most familiar versions of the tale, as told by Giambattista Basile, Charles Perrault, and Jacob and Wilhelm Grimm. Students will explore alternate tellings and revisions of the tale, both contemporary and historical, as they consider such questions as:

- what makes a story a "fairy tale"?
- how and why do certain versions of tales survive?
- do fairy tales express universal truths or culturally-specific issues–or both?
- what does it mean to revise and/or rework a fairy tale?
- are fairy tales for children?

Other questions will no doubt arise during the course of the semester as well. Students will write every day, read voraciously, and engage in vigorous class discussion as they develop their research questions for presentation to the class by the end of the semester.

Things you'll need for Twice-Told Tales:

- An open and curious mind.
- A willingness to re-examine some deeply-held beliefs.
- Respect for your fellow students.
- A notebook! And something to write with.

Course Goals

All FYS courses have the same five interlocking goals:

- expand and deepen students' understanding of the world and of themselves
- enhance their ability to read and think critically
- enhance their ability to communicate effectively, in writing, speech, and other appropriate forms
- develop the fundamentals of information literacy and library research
- provide the opportunity for students to work closely with a faculty mentor

We will approach these goals in a variety of ways, but primarily through intensive in-class writing and discussion, and out-of-class reading, viewing, and writing. More specifically, my hope is that in this

class you approach some familiar texts (fairy tales) with new insights, deepening your awareness of the cultural, literary, and political implications of this familiar form. Through attention to oral and written communication skills and library research skills, you will, by the end of the semester, have posed a research question, completed some preliminary research, and presented your findings in both written and oral form.

Course Assignments and Grading Breakdown

In-class writing and class participation: 20%

Much of our writing in class will be unstructured and ungraded. However, on occasion I will collect and respond to in-class writing. I will also provide periodic feedback on your class participation. Postings to the class blog are also considered part of class participation.

Formal papers (3): 60%

Each paper will go through at least one draft before being turned in for a grade. On occasion, further rewrites may be encouraged. See the course rubric for written work for more on grading standards.

Class presentation: 20%

You will present your research findings to the class in a formal presentation during the last two weeks of the semester. Early consultations with a Speech Consultant are strongly encouraged. (More on this in class.)

Course Policies

This is a discussion and writing class—we write every day, we talk every day. Obviously you can't participate if you're not here. So the first and most important policy for this class is to come, and come prepared. "Prepared" means you've done the reading (or the viewing, or the writing) for the day, thought about it, taken some notes, and even given some thought to what you'd want to say about it in class. Class meetings can't be made up**. You may miss two class meetings (one full week) with no questions asked; after that, missed classes will begin to affect your grade.** See me if you have a conflict such as a game, field trip, or family obligation beforehand—email or call if you'll miss class because of an illness.

In class: no laptops; cellphones off—unless we have a use for them, specified ahead of time. Since our class meets at what may feel like a mealtime, you may bring food & drinks into the classroom, but try to be discreet: onion sandwiches probably won't go over too well with your classmates.

Papers are due at the time and date specified in the syllabus, **with no exceptions.** You will be working either with your peers or with your Writing Consultant on your draft and you can't get good feedback from them if you haven't given them time to read it. Final drafts must be accompanied by marked drafts and any editorial feedback you've received. If I don't receive those materials with your paper, I won't read it until I get them—and I'll mark it late. **Be forewarned.**

The library workshop and consultations with your Writing Consultant are mandatory. Miss them at your peril.

This class is exploratory in nature—it's more about finding the right questions to ask than mastering a body of material. So at times the syllabus may change as we decide to follow a different set of questions. If/when that happens, I'll give you plenty of notice both in class and online—**please check your email regularly so you know what's going on.**

Week One: 8/23-8/26

1. Course Introduction, telling the story
2. Read: Basile, Perrault, Grimm (in Dundes, 3-29 and H&K, 97-102)
    a. Due in class: a 1-2 page version of Cinderella in your own words

Week Two: 8/30 – 9/2

1. Read: Rowe, "Feminism & Fairy Tales" (H&K, 342-358); Hjortshoj ch. 3
2. Read: Bettelheim, "The Struggle for Meaning" (H&K, 323-335) and Yolen, "America's Cinderella" (Dundes 294-306)

Week Three: 9/6 – 9/9

MW class

1. Read: Hjortshoj ch. 4 & 6; View in class: Ashpet
2. Class meets in Boatwright Library Computer classroom
    a. Complete the library tutorial before today's class: http://library.richmond.edu/services/students/fys/

TR class dates reversed:

1. Class meets in Boatwright Library Computer classroom
    a. Complete the library tutorial before today's class: http://library.richmond.edu/services/students/fys/
2. Read: Hjortshoj ch. 4 & 6; View in class: Ashpet

Week Four: 9/13 – 9/16

1. Draft due: paper #1; View in class: Disney's Cinderella
2. Read: Wood, "Domesticating Dreams" (electronic reserve); Hearne, "Disney Revisited" (H&K 386-393)

Week Five: 9/20 – 9/23

1. Revised draft due: paper #1; in class: Rylant, Cinderella
2. Read: "Vasilisa the Beautiful" and "Cap O'Rushes" (H&K, 102-111); Hamilton, "Catskinella" (handout); "Donkeyskin" (online: http://www.pitt.edu/~dash/perrault11.html)

Week Six: 9/27 – 9/30

1. Read: Warner, “Absent Mothers: Cinderella,” Tatar, “Tyranny at Home: ‘Catskin’ and ‘Cinderella’” (electronic reserves)
2. Read: Lee, “When the Clock Strikes,” Maitland, “The Wicked Stepmother’s Lament,” Sexton, “Cinderella” (H&K 117-138)); Hamilton, “Mary Belle and the Mermaid” (handout)

Week Seven: 10/4 – 10/7

1. Library project #1: begin reviewing Cinderella stories from blog
2. Read: Nodelman, “The Hidden Meaning and the Inner Tale,” Zipes, “Once Upon a Time in the Future” (electronic reserve)

Week Eight: 10/11 – 10/14

1. Fall Break
2. Read: A Little Princess

Week Nine: 10/18 – 10/21

1. Draft due: Paper #2; ; continue discussion of A Little Princess
2. Read: Hjortshoj, ch. 8; more blog reviews; additional reading/viewing TBA

Week Ten: 10/25 – 10/28

1. Revised draft due: Paper #2; in class: Rodgers & Hammerstein’s Cinderella
2. Annotated bibliographies due; in class: Film, continued

Week Eleven: 11/1 – 11/4

1. Read: Harry Potter and the Sorcerer’s Stone
2. Harry Potter, continued

Week Twelve: 11/8 – 11/11

1. Reading/viewing TBA
2. Paper proposals due

Week Thirteen: 11/15 – 11/18

1. Reading/viewing TBA
2. presentations in class

Week Fourteen: 11/22 – 11/25

1. presentations in class
2. Thanksgiving

Week Fifteen: 11/29 – 12/2

1. presentations in class
2. presentations in class

Final papers are due Thursday, 12/9 by noon for both sections

Assignments for Twice-Told Tales:

PAPERS

Paper #1: This is a 3-5 page paper in which you apply the insights of a critic to a text—in this case, a short film. Karen Rowe's essay "Feminism and Fairy Tales" claims that fairy tales harm women by depicting them as passive and offering only a single path to development through heterosexual (and patriarchal) marriage. Does Tom Davenport's short film, "Ashpet," address Rowe's objections to the traditional fairy tale? Ground your response in specific details from both Rowe's analysis and from the film.

Draft due: Monday, 9/13 or Tuesday, 9/14

Revised draft due: Monday, 9/20 or Tuesday, 9/21

Your first draft should be a completed paper, with a central claim, supporting evidence, analysis of that evidence, and a brief conclusion. You will work through the draft with your Writing Consultant, make any necessary revisions, and turn in both your revised and original draft (with your Consultant's commentary) one week later.

Paper #2: This is a 4-6 page paper in which you either compare and contrast two versions of "Cinderella" or analyze one version through the lens of one of the critics we have read so far.

A. For a comparison/contrast paper: select two Cinderella (or Cinderella-inspired) texts we have read in the course so far. Selecting key details from both texts, argue for the importance of their similarities/differences. That is, are both texts more similar, or more different? What do their similarities and differences mean?

   [Example: a comparison/contrast of two versions of "Little Red Riding Hood" might make the following claim: In the Grimms' version of "Little Red Riding Hood," the title character is rescued by a passing woodsman, while in Perrault's, she is killed and eaten by the wolf—end of story. This central difference—and others—suggests that the Grimms' version is not a cautionary tale but a tale of female helplessness and, especially, patriarchal power, while Perrault's more explicitly warns against sexual dangers.]

B. For a "critical lens" paper, choose one critic we've read and apply his/her insights to a text s/he does not address in the selected essay. Do his/her analysis and conclusions also apply to this text? This essay roughly follows the format of the first paper, but requires you to select both texts for consideration.

Draft due: Monday, 10/18 or Tuesday, 10/19

Revised draft due: Monday, 10/25 or Tuesday, 10/26

As with your first paper, your first draft should be a completed paper, with a central claim, supporting evidence, analysis of that evidence, and a brief conclusion. You will work through the draft with your Writing Consultant, make any necessary revisions, and turn in both your revised and original draft (with your Consultant's commentary) one week later.

Paper #3: This is a 7-10 page research paper on any element of the Cinderella tradition that interests you. It will be completed in several stages. **Completion of the library tutorial, attendance at the library workshop, and all the component parts listed below are required for the final paper: failure to complete any single part of the assignment by the relevant date will significantly affect your final grade.**

1. Annotated Bibliography: Due Wednesday, 10/27 or Thursday, 10/28

   An annotated bibliography is a brief listing of 4-6 articles or books you might consult for your final paper. Your annotation should note their relevance to an assigned text for the class, either an essay or a version of Cinderella. It should also note at least one significant claim made in the text. You may include up to two primary texts in your annotated bibliography: these should be versions of Cinderella, or references to the text, that we have not discussed so far in class. We will discuss how to develop a research question in class, and you will have ample time to come up with an interesting and workable topic.

2. Paper proposal: Due Wednesday, 11/10 or Thursday, 11/11

   Your paper proposal should be a 1-2 page exploration of your chosen topic, with a preliminary thesis and a brief analysis of some of your supporting evidence. If you like, you may also turn in an outline of your paper with the proposal.

3. Research Paper: Due Thursday, 12/9 by noon (in my mailbox)

   The final draft of your research paper should set out the research question posed by your proposal, and answer it with evidence drawn from a variety of sources, both primary and secondary. Your paper should include a works cited list in MLA format (this is separate from the annotated bibliography), a title page, and appropriate in-text citations where relevant. **Please turn in your (marked) annotated bibliography and paper proposal with your final draft.**

BLOG

The course blog is a place for us to post interesting resources and references to Cinderella that we find online and elsewhere. Each student must post at least once, and comment at least three times, on the course blog; dates will be announced in class.

PRESENTATION

During the last two weeks of class, we will hear presentations on your work in progress. Each student will prepare a 5-7 minute presentation on his/her work, which will be followed by a discussion period.

Your responsibility as a presenter is to be clear and analytical; as an audience member, to be attentive and curious.

Your presentation should include the same elements as your proposal—a statement of your research question or claim, an indication of your approach, and evidence in support of your claim. However, the presentation need not be quite so rigidly formatted as the presentation, and should focus primarily on either a demonstration that the research question is indeed a worthy one, or a more detailed analysis of some of the relevant evidence in support of the research claim. Handouts and visual aids may be used where appropriate. (For example: if you plan to analyze a long quotation, it's often better to provide it in a handout than to read it to your audience.)

You may either read a prepared paper or speak from notes, but in either case make sure that your presentation is clear and logically organized, and that you speak clearly and understandably. (This may mean slowing down your normal speech pattern, for example.)

Be prepared to take questions on your research.

FYS 100: Twice-Told Tales: Fairy Tales in Literary and Popular Culture

[Professor]
[Office]
[Phone]
[Email]
[Office Hours]
[Time]

COURSE DESCRIPTION

Fairy tales are among the most popular, and least understood, literature and entertainment we provide to children. But did you know that most fairy tales were not originally intended for children? That they contain stories of violence, adultery, cannibalism, and more? How did these become "nursery fare"? Do those origins still leave their traces in the children's movies and books that we know and love? And why do we keep telling them over and over again?

In this first-year seminar course we will delve into fairy tales, fairy tale revisions, adaptations, and reworkings, in order to explore the relevance of fairy tales for and beyond childhood and for and beyond entertainment. Questions we'll consider include:

- do fairy tales express universal truths or culturally-specific values–or both?
- what makes a story a "fairy tale"?
- who are fairy tales for?
- what does it mean to revise and/or rework a fairy tale?

LEARNING OBJECTIVES

The mission of this course is to help you to develop tools to both appreciate and analyze a wide variety of fairy tales and fairy tale revisions; to understand and be able to explain why the study of fairy tales and other popular culture entertainments (especially for children) is valuable; to evaluate and/or create interesting and rich fairy-tale based entertainments; and to develop the skills to pursue further research in the areas that interest you.

In addition, all first-year seminar courses share a set of common and interlocking goals for students. They will:

- expand and deepen students' understanding of the world and of themselves
- enhance their ability to read and think critically
- enhance their ability to communicate effectively, in writing, speech, and other appropriate forms
- develop the fundamentals of information literacy and library research
- provide the opportunity for students to work closely with a faculty mentor

These goals support and complement the specific learning goals for this seminar.

We will discuss and perhaps revise or supplement these goals as the semester goes on: what are your goals for the course? What do you hope to learn?

ASSESSMENT AND EVALUATION

We've got some big goals for this class—how will we achieve them? How will we know we've achieved them? There are several different kinds of assignments you'll be doing in the class—some formal, some informal, some that I'll assess, some that you, your peers, or even someone outside the class will assess for you.

Analytical papers (2)—35%

These papers will help you develop your skills in critical thinking and persuasive writing. The rubric [link] for them emphasizes thesis development, use of evidence, and clarity of expression—all components of good writing and thinking that we will work on in class. For both of these papers, you will produce an initial draft and then revise it with feedback from our Writing Consultant.

Creative project—20%

Your final project combines library research and creative expression, and will allow you to explore both what makes a fairy tale entertaining and why it matters. It will proceed in stages, with work accomplished both in and out of class and with feedback at various points along the way. The project will either be a proposal for a theatrical production at UR, or a brief theatre piece for children. You will present your final project in class as well as turning in written materials (bibliography, proposal, and reflection) at the end of the semester. The rubric [link] for your creative project emphasizes clarity of purpose, originality, and appropriate use of resources.

Class participation, including informal writing—25%

Class discussion is the lifeblood of the course—it is how we both create and share new knowledge. Some discussions will be in small groups, others in the full class, but we will have some discussion every day. Many of our discussions will be primed by either in-class or out-of-class writing, including freewriting, discussion prompts, response papers, and reflective pieces. Periodically throughout the semester you'll receive feedback on your class participation; you may also want to review the rubric for participation here. [link]

Learning portfolio—20%

At the end of the semester, you'll assemble most of the materials you've produced during the semester into a learning portfolio which you will turn into me with an essay in which you reflect on what you've learned over the course of the semester. I'll also ask you to write a letter to a future student in this course, suggesting tips for success.

COURSE TEXTS

Please do not buy your course textbooks until you've come to class; we will not always all be reading the same books. Books marked with an asterisk will be required of all students.

Alan Dundes, ed. Cinderella: A Casebook
Alan Dundes, ed. Little Red Riding Hood: A Casebook
*Martin Hallett and Barbara Karesek, eds. The Broadview Book of Folk & Fairy Tales
*J.K. Rowling, Harry Potter and the Sorcerer's Stone
*Jackson Pearce, Sisters Red
*Robin McKinley, Rose Daughter
*Keith Hjortshoj, The Transition to College Writing
[*Or: Gerald Graff and Cathy Birkenstein, They Say/I Say: The Moves that Matter in Academic Writing]

You will also have an opportunity to suggest both additional texts and films for the course; be thinking about other fairy tale entertainments that we might all share.

SCHEDULE OF READINGS AND ASSIGNMENTS

Theme for Section One: do fairy tales express universal truths, or culturally-specific values—or both?

Week One
Jan 11
Introduction to the course, syllabus review
Activity: Telling a story (in class)

Jan 13
Read: LRRH or Cinderella versions (by group)—Grimm, Perrault, etc.
Activity: (out of class) articulate goals for course; in class, discuss them

Week Two
Jan 18
Read: Karen Rowe: "Feminism and Fairy Tales"
Activity: write a version of your story (out of class)

Jan 20
Read: Bettelheim: "The Struggle for Meaning"
Activity: Think-Pair-Share w/critical essay (pair LRRH students with Cinderella students)

Week Three
Jan 25
Read: more versions of the tale (multicultural)

Jan 27

Read: “Forget what you know…” (NYTimes article on studying)
Thesis development workshop: from topic to question to thesis
Review rubric, view sample introductory paragraphs

Week Four
Feb 1
Readings TBA

Feb 3
Film viewing [Into the Woods, part one]
Activity: draft of paper #1 due
(peer review w/writing consultant during this week; revise)

Week Five
Feb 8
Reading TBA
Red Riding Hood students pair with Cinderella students to discuss representations of both in the film

Feb 10
Into the Woods, part two
Revised draft of paper #1 due

Theme for section two: What is a fairy tale?/What do fairy tales do?

Week Six
Feb 15
Read: Sleeping Beauty, Beauty and the Beast, Ugly Duckling

Feb 17
Read: two more critical essays (Bottigheimer? Jack Zipes?)
Activity: Write a letter to your mother/best friend/other interested party: why this class?

Week Seven
Feb 22
Reading TBA

Feb 24
Reading TBA
Activity: revise or rewrite the fairy tale you wrote for week two, taking into account other versions you have now read and critical approaches to fairy tales. This may serve as source material for your final project.

Week Eight
Feb 29
Reading TBA

Mar 2
Reading TBA

Week Nine
SPRING BREAK

Week Ten
Mar 14
Evidence workshop: developing an argument

Mar 16
Library workshop
Draft of paper #2 due

Week Eleven
Mar 21
Disney Cinderella in class (or Beauty & the Beast?)

Mar 23
Revised draft of paper #2 due
*Active learning activity: developing your final project [link; see below]

Theme for Section Three: What does it mean to revise/rework a fairy tale? What is intertextuality?

Week Twelve

Mar 28
Reading: Rose Daughter

Mar 30
Reading: Rose Daughter/other B&B versions
Annotated bibliography due in class: resources for final project

Week Thirteen
Apr 4
Reading: Sisters Red

Apr 6

Reading: Sisters Red/other LRRH versions
Proposal for final project due in class

Week Fourteen
Apr 11
Reading: Harry Potter and the Sorcerer's Stone

Apr 13
Reading: Harry Potter and the Sorcerer's Stone /other Cinderella versions

Week Fifteen
Apr 18
Workshop final project

Apr 20
Last day of spring classes: workshop final project

Final presentations will be during the time scheduled for our final exam: TBA

Active learning activity: come to class with an idea of which topic you'll choose. Students will be grouped according to their choices and will brainstorm approaches. After brainstorming, write down

1) what you already know about the project you're taking on
2) what you still need to know
3) how you plan to learn #2

Review this with someone not in your original group, revise (peer assessment); turn in revised version (instructor assessment); assessment will be formative: useful for refining/revising project, not graded.

A LITTLE MORE ON ASSIGNMENTS

Out of class writing assignments:

1) Jan 18: Write your own fairy tale (informal)

2) Feb. 3/10: Paper #1: Analyze a version through a critical lens (scaffolded project: use Karen Rowe with a selected version) (formal)

3) Feb. 17: Letter to a parent/friend: why is this class valuable? (informal)

4) Feb. 24: Revise your own fairy tale from week one, reflect on the revision: are there things you want to change having learned something about how critics read fairy tales? (informal)

5) Mar. 16/23: Paper #2: Compare and contrast some versions you've read (again, with critical lens?) (formal)

6) Unit three and exam week: final project as described below—build this one in stages from bibliography to prospectus etc. (public presentation and formal writing)

1. Imagine that you are helping the UR Theatre Department choose a version of Cinderella to perform on stage. You need to convince them that your version (one you've seen or read, or the one you wrote earlier in the semester) is appropriate for an intellectually curious and thoughtful audience—that is, your version should of course entertain, but it should also make people think. This means you'll need to provide a précis of your chosen version and how it differs from or conforms to our general assumptions about Cinderella. After that, you should argue for both the innovation and tradition your version represents, demonstrating a familiarity with prior research on Cinderella and earlier versions of the story.

2. Produce a children's theatre production of a fairy tale of your choosing. This is like option #2, but with a different audience. Option to work on this with elementary/middle school students? (Depends on CBL placement.)

COURSE POLICIES

This is a discussion and writing class—we write every day, we talk every day. Obviously you can't participate if you're not here. So the first and most important policy for this class is to come, and come prepared. "Prepared" means you've done the reading (or the viewing, or the writing) for the day, thought about it, taken some notes, and even given some thought to what you'd want to say about it in class. Class meetings by their nature cannot be made up. However, I recognize that sometimes unavoidable situations arise—illness, mandatory events for other classes or activities, etc. Therefore, **you may miss two class meetings (one full week) with no questions asked; after that, missed classes will begin to affect your grade.** (This includes the library workshop.) See me if you have a conflict such as a game, field trip, or family obligation **beforehand**—email or call if you'll miss class because of an illness.

In class: no laptops; cellphones off—unless we have a use for them, specified ahead of time. Since our class meets at what may feel like a mealtime, you may bring food & drinks into the classroom, but try to be discreet: onion sandwiches probably won't go over too well with your classmates.

Because you will be working either with your peers or with your Writing Consultant on your written work, it is imperative that you make your deadlines so they can make theirs and give you good feedback. Similarly, when you are responsible for feedback, you need to provide it in a timely manner. I, too, will provide feedback on final drafts that is intended to help you improve on subsequent written work. All of this feedback takes time, though, and if your work at any stage is late, the feedback you receive will be compromised. Final drafts must be accompanied by marked drafts and any editorial feedback you've received. If I don't receive those materials with your paper, I won't read it until I get them—and I'll mark it late.

The library workshop and consultations with your Writing Consultant are mandatory. Again, other people are committing their time to us—to be respectful of their time, we need to be on time, be prepared, and be attentive at these events just as for class.

This class is exploratory in nature—it's more about finding the right questions to ask than mastering a body of material. So at times the syllabus may change as we decide to follow a different set of questions. If/when that happens, I'll give you plenty of notice both in class and online—**please check your email regularly so you know what's going on.**

RESOURCES

There are some wonderful online resources for the study of fairy tales, and of Cinderella and Little Red Riding Hood in particular. Here are a few; let me know if you find more!

Sur La Lune's Cinderella Page
The Cinderella Project, University of Southern Mississippi
D. L. Ashliman's Cinderella Page
The Cinderella Bibliography, by Russell Peck
The Little Red Riding Hood Project, University of Southern Mississippi
Sur La Lune's Little Red Riding Hood Page
D.L. Ashliman's Little Red Riding Hood Page

Finally, some links that have nothing to do with Cinderella or Little Red Riding Hood: How to Study: A Brief Guide, by William J. Rappaport

BME 2240: Biotransport

[Course Information]
[Instructor Information]
[TA Information]

Objectives:

To introduce principles and mathematics governing biological and biomedical transport processes; to apply classical engineering solutions and governing equations from simple transport problems to more complex biomedical transport processes; and to integrate knowledge of cell and organ physiology with mathematical expression of transport principles.

Pre-requisites: APMA 2120, 2130.

Co-requisites: BME 2220, BME 2104 or instructor permission.

Textbook: R.L. Fournier, Basic Transport Phenomena in Biomedical Engineering, 3rd ed., Boca Raton, FL: Taylor & Francis, 2012, ISBN 978-1-4398-2670-6

Format:

Lecture materials will be supplemented with readings from the textbook.

Supplemental materials and slides containing figures for discussion in class will be posted on the class webpage on UVa Collab.

Friday Discussions will include supplemental lecture material, mathematical derivations, extra example problems, and homework help.

Homework problem sets may be individual or group projects as specified in each assignment. Homework will not be accepted late without prior arrangement with [professor].

Two midterm tests will consist of short explanation or analysis questions. The final exam will be comprehensive. You must work alone; you may not use your notes or any other source of information except as specified in the test instructions. Review sessions will be offered before each test.

All work is to be your own work (see the Honor Statement below). If you consult published material, then you must cite those sources appropriately.

Honor Statement:

I trust every student in this course to fully comply with all of the provisions of the UVa Honor System. In addition to pledging that you have neither received nor given aid on an assignment, your signature also affirms that you have not knowingly represented as your own any opinions or ideas that are attributable to another author in published or unpublished notes, study outlines, abstracts, articles, textbooks, or web pages. In other words, I expect that all assignments and reports are your original work and that references are cited appropriately. All alleged honor violations brought to my attention will be forwarded to the Honor Committee.

If, in my judgment, it is beyond a reasonable doubt that a student has committed an Honor violation with regard to a given exam or assignment, the student will receive zero credit for that assignment, irrespective of any subsequent action taken by the Honor Committee.

Date	**Topic**	**Assignment**
Th 1/19	Definitions and Concepts	
Tu 1/24	Conservation Laws; Material Balances	
Th 1/26	Thermodynamics	
Tu 1/31	Thermodynamics	HW 1 due
Th 2/2	Thermodynamics	
Tu 2/7	Forces in Fluids	
Th 2/9	Momentum Balances	
Tu 2/14	**Exam 1**	
Th 2/16	Rheology	
Tu 2/21	Newtonian Velocity Field	HW 2 due
Th 2/23	Dimensional Analysis	
Tu 2/28	Energy Balances	
Th 3/1	Energy Balances	HW 3 due
Tu 3/6	No Class—Spring Break	
Th 3/8	No Class—Spring Break	
Tu 3/13	Solute Transport; Fick's 1st Law	
Th 3/15	Steady-State Diffusion	
Tu 3/20	Dimensional Analysis; Diffusion and Convection	
Th 3/22	Diffusion and Convection	HW 4 due
Tu 3/27	Diffusion and Convection	
Th 3/29	Heterogeneous/Porous Media	
Tu 4/3	**Exam 2**	

Th 4/5	Heterogeneous/Porous Media	
Tu 4/10	Heterogeneous/Porous Media	
Th 4/12	Heterogeneous/Porous Media	HW 5 due
Tu 4/17	Oxygen Transport in Tissues	
Th 4/19	Oxygen Transport in Tissues	
Tu 4/24	Extracorporeal Devices	HW 6 due
Th 4/26	Immobilized Enzyme Reactors	
Tu 5/1	Affinity Column	

Final Exam: Monday, May 7, 2:00 pm–5:00 pm, Thn E303

Grade: Homework 60%; Midterms 20%; Final exam 20%.

Approximate grading scale (I use the full scale): A+ >97; A >93; A– >90; B+ >87; B >83; B– >80; C+ >77; C >73; C– >70; D+ >67; D >63; D– >60; F <60

BME 2240 Biotransport
Learning Guide

[Instructor:]
[Teaching Assistant:]

When and where do we meet?

[Class discussions:]
[Coaching sessions:]
[Office hours:]
[TA office hours:]

Why should you care about Biotransport?

How can you deliver a drug to kill tumors without killing the patient? How can you harness nanotechnology to design inexpensive kits to diagnose diseases in low-resource countries? How do new blood vessels grow? These are examples of "grand challenges" faced by practicing biomedical engineers that require us to design mathematical and experimental approaches for predicting, measuring, and interpreting flow phenomena quantitatively. In this course, you will combine your knowledge of applied mathematics and human physiology from the molecule to cell to whole body length scales to begin exploring how to answer grand challenge questions such as these.

How will this course help you succeed?

Grand challenges are fundamental questions in biotransport with broad applications to science, engineering, and human health. This course will help you acquire a conceptual and practical framework that you can apply to solve complex grand challenges in your future research, engineering practice, or clinical practice. By the end of the course, you will be able to answer the following questions:

1) How do I use math to figure out how, why, and where stuff flows in the body?

2) Some equations in physics and engineering are easy, like $F = ma$. When and how can I use simple common sense equations for flows in my complicated biology models or medical device designs?

3) I've taken classes like calculus and cell biology, but I don't know what those classes have to do with each other. How do I put stuff from other classes together to solve real-world biology problems or to design medical devices?

4) Can I use equations and answers that I found using Google and Wikipedia to solve homework problems and to do engineering design?

5) How do I use equations and answers from this class to solve problems in research and medicine next year in my Senior Capstone Project or after I graduate?

Want to see these objectives in the geeky language of academics and ABET? Click here [online resource].

Where can you look for important information?

Anywhere you want! "Real" biomedical engineers use handbooks, textbooks, online resources, peer-reviewed articles, and personal communications with colleagues, etc. to learn what they need to know to answer complex questions like the ones listed above. As your colleague, I will recommend some resources and post my notes on the class Collab site [online resource], but you should not feel limited to only the materials I suggest. In fact, you will probably need additional resources to complete the full story surrounding some of these challenging questions.

How will you succeed in this course?

Participate. You are expected to participate actively in the course based on your own learning goals. Since you all come from different backgrounds and science experiences, your peers are valuable resources for learning. Don't shortchange them and yourself by coming to class without preparing or by sitting quietly during class discussion.

Communicate. This course may be unlike any of your previous courses, with increasingly complex content and new kinds of engineering challenges. Because I am committed to helping you address these new challenges, I have an open door policy in addition to class and office hours; I will meet with you or respond to your email within 24 hours whenever possible. You should let me know what ideas and tools are challenging to you and how you are doing in the class. If you start this habit early in the semester, then I will be able to better tailor our activities to help you learn. If you're not comfortable with email or office hours, then post a comment in Anonymous Feedback on the class Collab site [online resource].

Take risks. Engineering design often requires personal judgments about which references to include or ignore, which mathematical approaches to follow, and/or how to interpret complex data. Sometimes the "right" answer is unknown, incomplete, or even wrong! Nobel Prize breakthroughs have often resulted from attempting to support a "best guess" with incomplete data or from finding evidence to explain an "experiment gone wrong." You will be rewarded for going out on a limb to defend your ideas as long as your assumptions and decision-making process are transparent in your answers. If you're not sure how to start a problem, don't be scared to defend your assumptions and go for it!

Have fun. Sometimes we all need a mental break. During each class, we will take a break while one or more of you tell a joke. The only rule is that it must not be a joke that will get me fired! Jokes are not graded; it's just for fun! A suggested schedule of daily jokers is listed on the iSyllabus [online resource].

How will you and I evaluate your progress?

Solving a grand challenge (25%). In this group project, you will identify and set up a framework to solve a grand challenge in biotransport. We will work together early in the semester to identify a list of topics based on your suggestions, research and design challenges in the BME department and UVa, and current events in medicine and engineering. Your team's goal is to identify, to evaluate, and to integrate resources from class, in textbooks, in peer-reviewed literature, and online that you will use to develop a

framework for addressing the grand challenge. In some cases, you may be able to propose a complete mathematical solution. Your grade will be based on a rubric (that I will share with you) that assesses criteria such as problem definition, evaluation of resources, peer review of each other's work, responses to peer review, quality and completeness of the solution framework, and discussion of the innovativeness and importance of your project.

Out-of-class problems (25%). Practicing by doing is often effective to help you learn common equation derivations and mathematical methods. The homework problems are designed to give you practice setting up and solving analytical equations that you will be able to apply to answer questions in specific biomedical engineering applications. The TA and I are available during Friday morning coaching sessions to help you when you get stuck. The Homework Guide [online resource] will help you with formatting guidelines, electronic submission, and grading rubric. In some cases, you will grade each other's answers.

In-class problems (25%). In the role of professional consultant, biomedical engineers sometimes need to come up with common equations and solution methods quickly. During a few classes, you will act as consultants, either individually or in teams, to solve new twists on problems that you have seen before. You can solve the problems using any resources available to you in the classroom (including web-enabled devices).

Final exam (15%). The cumulative final exam will challenge you with a series of short questions and problems to assess your ability to integrate concepts and methods from class discussions and your grand challenge project.

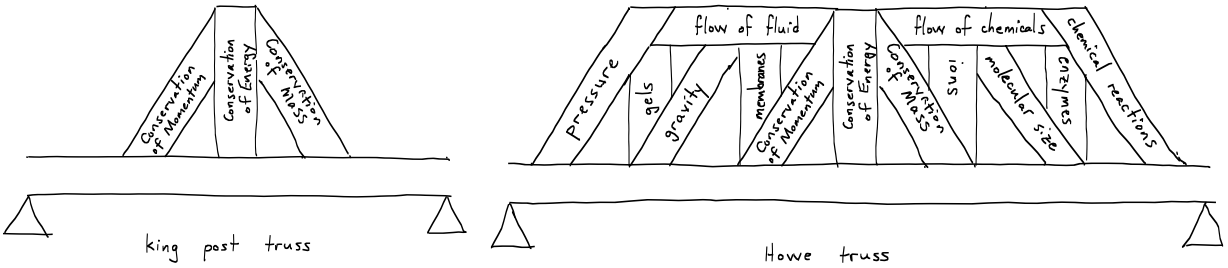
Helping yourself learn (10%). In order to evaluate your own progress in learning each day's concepts, you will be asked to answer a short question or write a "one-minute paper" either during or after each class. Specific instructions will be provided with each assignment. These answers will not be graded individually, but completing them thoughtfully will count towards your grade. Some will be submitted anonymously. In order to help us figure out where we are, the following class will sometimes start with feedback and discussion of these answers.

Professional and Academic Integrity

As practicing professionals, engineers are trusted to maintain the highest standards of ethics, integrity, and personal responsibility. Since you have joined this community of trust to prepare for your future career, I expect you to fully comply with all of the provisions of the UVa Honor System. In addition to pledging that you have neither received nor given aid on an assignment, your signature also affirms that you have not knowingly represented as your own any opinions or ideas that are attributable to another author in published or unpublished notes, study outlines, abstracts, articles, textbooks, or web pages. In other words, I expect that all assignments and reports are your original work and that references are cited appropriately. Breaking this trust agreement not only will result in zero credit for the assignment in question and referral to the Honor Committee but also will jeopardize your future as a professional engineer. Don't let yourself down.

What will we do in this course?

The bridge truss diagrams below illustrate how we will develop your framework for solving a grand challenge question in biotransport. The three conservation laws are like the basic shape of a king post truss bridge: they are required and sufficient to provide a stable foundation for any bridge truss design or to solve any biotransport problem. However, for more complicated or specialized problems, like longer bridge spans, heavier truck loads, or multi-lane highways, more complicated truss designs are required that use additional truss elements. Likewise, we will solve complex biotransport problems by adding elements to the basic conservation laws.



The calendar of class activities is published here [online resource]. In order to help you plan, the due dates for assignments are fixed. The rest of the list is *dynamic* so I can adjust the activities and timing based on our progress and interests. I will update the calendar after each class to keep you informed.

More questions?

Check out the class FAQ [online resource].

Learning Goals

1) To approach problem-solving as a practicing engineer. (Foundation Knowledge; Application; Integration; Learning to Learn)

2) To become curious and creative in using math to solve medical problems. (FK; Application; Caring; Learning How to Learn)

3) To integrate skills and knowledge from earlier courses. (Integration)

4) To appreciate classical engineering fluids and mass transport solutions and their relevance to more modern or sophisticated numerical approaches. (Foundation Knowledge; Application; Caring)

Formal Objectives (ABET)

1) to identify the principles, assumptions, and mathematics governing biological transport processes [Foundation Knowledge];

2) to apply classical engineering solutions, boundary conditions, and governing equations to complex biomedical transport processes and device designs [Practical Thinking];

3) to integrate knowledge of cell and organ physiology with mathematical expression of transport principles [Application; Integration];

4) to find and to evaluate critically classical engineering problem solutions available in well-known textbooks or online resources [Critical Thinking; Practical Thinking; Learning How to Learn];

5) to synthesize new applications of analytical engineering solutions to problems in research and medicine [Creative Thinking; Caring; Learning How to Learn].

SOC 2900
Economy & Society

[Time and Location]
[Instructor]
[Office Location]
[Instructor Email]
[Office Hours]
[Teaching Assistants]

Economic sociology focuses on the ways that social relations and institutions shape, structure, and constitute the economy. It is a particularly interesting approach because we often consider the economy as a sphere that is not, or should not be, affected by social processes. Borrowing from economists in particular, the non-sociological view of the economy focuses and exalts the "invisible hand" of the market – a suggestive image that connotes the self-regulating nature of the market, specifically, the fact that the law of supply and demand generates a price that "clears" the market, brings it into equilibrium, and thus serves the general interest. But for sociologists, it is not individuals, but social groups and social relations; not voluntary and self-interested exchange, but power and mutual obligations, that constitute the most important aspects of economic behavior – aspects that the metaphor of the "invisible hand" simply cannot capture.

To sociologists, then, the economy is a set of collective arrangements among social groups to organize the extraction, use, and distribution of resources. Families, religion, labor unions, criminal organizations, governments, and even economics are examples of institutions that, under certain conditions, become central to how economic activity is defined and carried out. These arrangements do not emerge spontaneously, even if we often treat them as if they did: the fact that, as collective representations, these arrangements gain legitimacy and stability, so that we begin to take them for granted, as if they were natural and inevitable, is itself a matter of great interest to the sociological imagination.

In this course, then, we will look at how much economic behavior varies, both in its practical and symbolic aspects, as a function of the social and cultural context in which it takes place; and we will also look at how it varies historically. You will leave this course with the skill to think critically about the economy; with an appreciation of its complexities; and most importantly, with the realization that the economy is not a rarified arena where abstract forces play themselves out, but where real people struggle with real people, who often have competing interests and ideas, over the things they value.

READINGS, LECTURES, AND DISCUSSIONS

All the readings for this course have been collected in a course packet, which you can download from Collab or buy at Brillig books on Elliewood Avenue.

It is crucial that you read all the assigned material before coming to class for two reasons: first, the readings will give you the foundational concepts necessary to understand the lectures. The lectures will suddenly become more enjoyable and stimulating. You won't have to worry about writing down every single word I say because you will have enough of a background to understand the flow of the argument.

Second, and most importantly, the readings will give you the tools to engage in discussions and to think critically about the issues at hand. Even though I will lecture two times a week, you will be an active participant both in the lectures and in the discussion sections run by the Teaching Assistants, because each lecture and discussion section will give you an opportunity to shape what you learn in this class.

In order to make this possible, you will be responsible to complete a series of assignments throughout the semester. They are all centered around a learning technique specifically devised to develop critical thinking: reflective writing.

ASSIGNMENTS AND EVALUATION

One series of assignments is weekly. Every week, that is, you will be responsible for the following:

1. Before you do the readings, write down a memo (two to three paragraphs) covering the following three points: (1) what you already know about the topic we are going to learn about over the week; (2) where your previous knowledge of the topic comes from (e.g. personal experience, experience at work, in an organization?); (3) what you expect to be learning over the week. Label the file "Pre-Reading Date" (e.g. Pre-Reading, Sep25) and post it on Collab in the drop box by Monday 5pm.
2. Write a one-minute paper at the end of each lecture on Thursday. I will give you a flashcard. You will write down your name on it and answer THREE questions pertaining to the lectures: What was the main point of the two lectures in that week? What was the muddiest point? What important question remains unanswered to you? Hand back your flashcard to your TA. I will select a list of points and questions that will help organize your discussion section on Friday. So the questions you raise after the lecture (YOUR questions) will be the questions you discuss in your sections. You will thus shape the content of what you learn!
3. Each week by Monday, moreover, you will be given a reflective assignment that you need to hand in to your TA at the beginning of your discussion section on Friday. (Each week you will be given specific instructions on this assignment).
4. At the end of each of your Friday discussions, you will have 10 minutes to write a four-paragraph reflection memo that (1) summarizes what you did in the assignment you handed in to your TA, (2) shows if and in what ways your participation in the discussion made you change your thinking, and (3) states what questions you still have that have not been addressed. Finally, you will write (4) one sentence with the take-home point for the week. If 10 minutes are not enough, you can continue this assignment at home. At home, type your paper up. By 5pm Sunday, I want you to post it on Collab in your drop box. Label the file Post-Discussion Date.

To summarize, then, four assignments each week, due on the following dates:

Monday 5pm: pre-readings reflection memo;

Thursday in class: one-minute paper;

Friday at discussion section: weekly assignment;

Friday after discussion section, due by Sunday 5pm: post discussion reflection memo.

A second set of assignments will take place in the times traditionally dedicated to the midterm and the final examination. For your midterm exam, and for your final exam as well, I will ask you to print your

previous weekly assignments, bring them to class, and write a "process folio." A process folio is a written statement that reflects upon your learning experience. It addresses the following questions:

1. What key ideas or information have your learned about economic sociology?
2. In what ways have your interests, feelings, or values changed as a result of this learning experience?
3. What have learnt about how to use or apply economic sociology?

In this course, then, there will be no tests. You will not have to stress about memorizing notions that you will forget as soon as the exam is over; you will not have to worry about multiple choice or true/false questions. But to do well in this course, however, you will have to become extremely well organized.

10% of your grade depends on your active participation in discussion sections.

Your weekly assignments will also be graded. Overall, 30% of your final grade depends on how well you do on them.

30% of your grade will depend on the care with which you document your learning experience through your weekly memos, not on the quality of the reported experience. You receive an A on this set of assignments only if you do not miss any pre-reading memo, one-minute paper, or post-discussion memo. For each single assignment you miss, your grade on this portion of the course decreases by 1/10. Second, to receive an A on this portion, each of your memos must address the questions I have specified above.

The final 30% of your total grade comes from your cumulative performance on the midterm and the final.

COURSE SCHEDULE

Week 1. Introduction to the Course and the Classical View on Capitalism

August 24

Wessel, David. 2009. "Inside Dr. Bernanke's ER." The Wall Street Journal, July 24th.

August 26

Adam Smith. Wealth of Nations: Chapters I-II.

Week 2. Solidarity and the Problem of Meaning in Economic Action

August 31

Durkheim, Émile. 1933. The Division of Labor in Society, Translated by George Simpson. New York: Free Press. Pp. 39-41, 104-113, 129-131, 193-195, 226-227, 287-291, 277-280.

September 2

Zelizer, Viviana. “Human Values and the Market: The Case of Life Insurance and Death in 19th Century America.”
Gambetta, Diego. 1991. “‘In the beginning was the Word…’ The symbols of the mafia.” European Journal of Sociology 32:53–77.

Exercise #1 due in Section.

Week 3. Obligations, Beliefs, and Ideas: The Institutional Approach to the Economy

September 7

Weber, Max. 2001 (1930). The Protestant Ethic and the Spirit of Capitalism. Trans. by Talcott Parsons. New York: Routledge. 3-11; 39-41;102-109;115- 116;124-125.

September 9

Dobbin, Frank. 1994. Forging Industrial Policy: The United States, France and Britain in the Railway Age. New York: Cambridge University Press. pp. 1-27.

Exercise #2 due in Section.

Week 4. Views on the Market, Views on the State

September 14

Polanyi, Karl. “The Economy as Instituted Process.”

September 16

Evans, Peter B. 1989. “Predatory, Developmental, and Other Apparatuses: A Comparative Political Economy Perspective on the Third World State.” Sociological Forum 4:561.

Exercise #3 due in Section.

Week 5. The Market as a Political Construction

September 21

Leifer, Eric and Harrison C. White, 1983. “A Structural Approach to Markets,” pp. 85-108 in Mark S. Mizruchi and Michael Schwartz (eds.), Intercorporate Relations

September 23

Smith, Charles W. 1993. “Auctions: From Walras to the Real World,” pp. 176-192 in Richard Swedberg (ed.), Explorations in Economic Sociology.

Exercise #4 due in Section.

Week 6. The Rise of Corporations: a New Kind of Capitalism?

September 28

Chandler, Alfred D. Jr. 1977. The Visible Hand. Cambridge: Harvard Univeristy Press. Pp. 1-12 Du Boff, Richard and Edward S. Herman. 1980. "Alfred Chandler's New Business History: A Review," Politics and Society, 87-110.

September 30

Mizruchi, Mark. 2004. "Berle and Means Revisited: The Governance and Power of Large U.S. Corporations." Theory and Society 33:579-617.

Exercise #5 due in Section.

Week 7. Scientific Management

October 5

Taylor, Frederick Winslow. 1911. The Principles of Scientific Management. New York, Norton. Pp. 9-29. Braverman, Harry. 1974. Labor and Monopoly Capital; the Degradation of Work in the Twentieth Century. Foreword by Paul M. Sweezy. New York, Monthly Review Press. Pp. 70-84.

October 7

Stark, D. 1980. "Class struggle and the transformation of the labor process." Theory and Society 9:89–130.

Exercise #6 due in Section.

Week 8.

October 12: Reading Day, no Class

October 14: MID TERM EXAM (REFLECTIVE PORTFOLIO)

Week 9. Postfordism and the Commodification of Emotions

October 19

Jessop, Bob. 1996. "Post-Fordism and the State." Pp. 165-83 in Comparative Welfare Systems. Edited by Ben Greve. New York: St. Martin's Press.

October 21

Leidner, Robin. 1999. "Emotional Labor in Service Work." The ANNALS of the American Academy of Political and Social Science 561:81 -95.

Exercise #7 due in Section.

Week 10. Liberalism and Neoliberalism

October 26

Polanyi, Karl. 2001. The Great Transformation. Boston: Beacon Press. Ch. 12.

October 28

Portes, Alejandro. 1997. "Neoliberalism and the Sociology of Development: Emerging Trends and Unanticipated Facts." Population and Development Review 23:229-259.

Exercise #8 due in Section.

Week 11. Social Consequences of De-Industrialization

November 2

Wilson, W.J. 1998. "When Work Disappears: New Implications for Race and Urban Poverty in the Global Economy." Center for the Analysis of Social Exclusion.

November 4

Wacquant, Loïc. 2001. "The Penalisation of Poverty and the rise of Neo- Liberalism." European Journal on Criminal Policy and Research 9:401-412.

Exercise # 9 due in Section

Week 12. The Rise of Finance and the Sociology of Bubbles

November 9

Davis, G. F., and M. S. Mizruchi. 1999. "The Money Center Cannot Hold: Commercial Banks in the US System of Corporate Governance." Administrative Science Quarterly 44:215-217.

November 11

Abolafia, Mitchel Y., and Martin Kilduff. 1988. "Enacting Market Crisis: The Social Construction of a Speculative Bubble." Administrative Science Quarterly 33:177-193.

Exercise # 10 due in Section

Week 13. Globalization

November 16

Gereffi, Gary. 2005. “Global Economy.” pp. 161-182 in Handbook of Economic Sociology, Edited by Neil Smelser and Richard Swedberg. Princeton: Princeton University Press.

November 18

Block, Fred. 2007. “Understanding the Diverging Trajectories of the United States and Western Europe: A Neo-Polanyian Analysis.” Politics & Society 35:3-33.

Exercise #11 due in Section

Week 14. A Critical View on the Future of Capitalism

November 23

Arrighi, Giovanni. 2009. “The Winding Paths of Capital (Interview with David Harvey). New Left Review (56): March-April.

November 25

Thanksgiving

Week 15. Social Consequences of Globalization: Two Views

November 30

Bourdieu, Pierre, and Loïc Wacquant. 1999. “On the Cunning of Imperialist Reason.” Theory, Culture & Society 16:41-58.

December 2

Caplan, Bryan, and Tyler Cowen. 2004. “Do We Underestimate the Benefits of Cultural Competition?.” The American Economic Review 94:402-407.
Cowen, Tyler. 2002. Creative Destruction: How Globalization Is Changing the World's Cultures. Princeton, N.J.: Princeton University Press. (Chapter 6)

Exercise #11 due in Section.

Week 16. Course Review.

December 7

Final Exam: Thursday, December 9 from 2pm to 5pm. (FINAL REFLECTIVE PORTFOLIO).

Draconian yet fair university policy: “Unexcused absence from a final examination results in an automatic grade of F in the course.”

More Course Policies

Last day to drop a class without penalty:[ ]

Last day to drop with W: [ ]

Attendance at section is a requirement of the course. Students who need to miss a section should contact their TA prior to section meeting to inform them of the absence. TAs will do a lot of work to make your sections interesting and enjoyable. But you have to reciprocate: students missing more than two section meetings without excuse prior to the absence will receive a ZERO for their section participation grade. Participation grade of course depends on your actual participation: to do well in this course, you must PARTICIPATE, not simply show up.

Please review and make sure you understand the honor code. Research actually shows that knowing the honor code and reading it regularly does make you a better, healthier person. It certainly warns you against particularly serious offenses such as PLAGIARISM. To make sure you are not plagiarizing, you must adequately acknowledge whether you're borrowing ideas or expressions from other sources.

BIOL 4260 – Cell Mechanisms

[Instructor]
[Office, Email]
[Office Hours]
[Class Time, Location]
Prerequisites: BIOL 300 (Core 1) and BIOL 301 (Core 2)

Course overview

We will explore selected topics in cell biology that underlie our understanding of human health and disease. One focus topic for Spring 2011 will be the cell biology of cancer and metabolic syndromes; approximately 60% of the course time will be spent on these topics. The remaining ~40% of the class time will focus on cell biological aspects of other topics of the students' choosing. Students will work in small groups, choose the discussion topic, plan and execute a background lecture and select and lead discussions of a primary research paper related to their topic. Each group will assign study questions and write quiz questions for the purpose of peer assessment.

Learning goals

At least five years (or longer) after completing this course, you will successfully…

1. Identify basic mechanisms underlying cellular processes and understand how each confers specific cellular functions.
2. Integrate the myriad cellular processes into a biological system.
3. Understand how changes in cellular mechanisms can result or contribute to pathology of a subset of human diseases.
4. Appreciate the power of the scientific process to lead to new discovery/understanding about cellular processes in healthy and disease conditions.
5. Interpret and design experimental approaches to test hypotheses about the mechanisms of cellular processes.
6. Critically evaluate research articles from the biomedical/scientific literature.
7. Appreciate how understanding of cellular mechanisms can lead to design of effective drugs or therapeutic regimens.
8. Appreciate the beauty of proteins (and other lovely molecules!).
9. Develop an ongoing, deep interest in cell biology.
10. Ask "good" questions about the biochemical, cellular and mechanistic aspects of human health, disease and cutting-edge research.

How will we get there?

We will accomplish these goals by thoughtful and lively discussions in lecture, problem-solving to practice applying basic concepts and approaches to mechanistic questions, analyzing and interpreting data from the primary research literature, reading research articles pertinent to material discussed in class and formulating good questions about how biochemical processes impact our day-to-day lives. The following activities will guide our quest:

1. Engage the assigned readings critically before the class and come to class prepared to actively discuss the major concepts or specific details.

2. Complete assigned study questions due online prior to our discussions. The study questions will provide significant basis for class discussions.
3. Learn some material on your own, particularly those that involve basic review of cell/molecular biology as discussed in Cores I & II. Specific guidelines for what you will be expected to know will be discussed in class.
4. Formulate good questions about things you don't understand. Bring these issues up in class. Consider ideas about where you think the research might go in the future.
5. Participate actively in class discussions.
6. Work in groups and teach the rest of us some cool cell biology.

Required Readings

No specific textbook is required. Class discussion will be based on the "required" primary research articles and related review articles as outlined in the course schedule. A general cell biology textbook or online resource should be referenced as needed to brush up on basic cellular mechanisms learned in BIOL 3000/3010 (Core I/II or their equivalents).

Assessment

In-class participation: 20%; Pre-class homework 20%; Take home quizzes 40%; Group presentation and assignments 20%.

Attendance

Attendance is required and impacts the "participation" component of your grade. Quizzes will be take home-style and scheduled as indicated on the syllabus.

BIOL 4260 Cellular Mechanisms Discussion Schedule

Meeting day	Discussion topic & assigned reading	Pre-class work
W Jan 19	Intro & discussion of course goals, plan and cell bio review	
F Jan 21	**Hallmarks and Milestones** "Hallmarks of Cancer", Hanahan and Weinberg, Cell 100:57 (2000) "Milestones in Cancer", Nature Milestones: Cancer (2006)	Study questions #1 due online
M Jan 24	**Metastatsis overview** "Seed-Soil Hypothesis: Paget, Lancet 1:571 (1889)	

	Review article: Fidler, Nat.Rev.Can. 3:1-6 (2003)	
W Jan 26	**EMT overview** Review article: Yang and Weinberg, Dev. Cell 14:818 (2009) Guide to reading primary research articles.	
F Jan 28	**Twist:** Yang, et al. Cell 117:927 (2004) See commentary: Kang and Massague, Cell 118: 277 (2009)	Study questions #2 due online
M Jan 31	**Beyond EMT – Twist and regulatory RNAs** Review article: Esquela-Kerscher and Slack, Nature Reviews Cancer 6:259 (2006)	
W Feb 2	miRNA10b & Invasion: Ma, et al., Nature 449:682 (2007)	
F Feb 4	**Discussion of other Twist-dependent processes**	"New Twists" commentary due
M Feb 7	**Tumor Micro-Environment – Friend or Foe?** Review article: Mueller and Fusenig, Nature Reviews Cancer 4:839 (2004)	
W Feb 9	MMP-9, BM cells and Skin Cancer: Coussens, et al. Cell 103:481 (2000)	Study questions #3 due online
F Feb 11	Catch-up day and planning session for group presentations	Quiz 1 handed out (microenvironment related)
M Feb 14	**Mechanotransduction: forcing tumor progression** Review article: Orr, et al., Dev. Cell 10:11-20 (2006)	Quiz 1 due
W Feb 16	**ECM cross-linking and integrin signaling:** Leventhal,	Study questions #4 due online

	et al., Cell 139:891 (2009)	
F Feb 18	Catch-up day and work on group presentations	
M Feb 21	**Cell cycle checkpoints, arrest and apoptosis** Review article: Weaver and Cleveland, Cancer Cell 8:7 (2005)	
W Feb 23	**Targeting Mitotic Exit:** Huang, et al., Cancer Cell 16:347 (2009)	Study questions #5 due online
F Feb 25	Catch-up and work on group presentations	Quiz 2 handed out
M Feb 28	**Unfolded protein response: metabolic connections to disease** Review article: Rutkowski and Hegde, J. Cell Biol. 189:783 (2010) (UPR-related)	
W Mar 2	**ER Stress, obesity and diabetes:** Ozcan, et al., Science 306:457 (2004)	
F Mar 4	Catch-up day. Work on group presentations	Quiz 2 due
Mar 5 - 13	Spring Break!!!!	
M Mar 14	**Exercise and chronic disease** Review article: Handschin and Spiegelman Nature 454:463 (2008)	
W Mar 16	**PGC-1 and mitochondrial function:** Zechner, et al., Cell Metabolism 12:633 (2010) **note, subject to change!	Study questions #6 due
F Mar 18	Catch-up day. Work on group presentations.	
M Mar 21		Group 1 presents
W Mar 23		"
F Mar 25		Group 2 presents

M Mar 28		"
W Mar 30		Group 3 presents
F Apr 1		"
M Apr 4		Group 4 presents
W Apr 6		"
F Apr 8	Catch-up day and review of Groups 1-4 Group cartoons due	
M Apr 11		Group 5 presents
W Apr 13		"
F Apr 15		Group 6 presents
M Apr 18		"
W Apr 20		Group 7 presents
F Apr 22		"
M Apr 25		Group 8 presents
W Apr 27		"
F Apr 30	Catch-up day and review of Groups 5-8 Cell Mech	"Survivor" game
M May 2	Feedback and quiz 3 distributed.	Final quiz due date May 7