

Name – Faculty Development Documents

Department of Biology

4143 LSB, Provo, UT 84604

email: Name@byu.edu; phone: 801-422-4879

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FACULTY DEVELOPMENT PLAN

UNIVERSITY EXPECTATIONS

The *BYU University Policy on Faculty Rank and Status* invites new faculty members to create a Faculty Development Plan. According to university documents, this plan should “describe the faculty member’s proposed activities in the areas of citizenship, teaching, and scholarship” focusing on five elements:

- A. A self-assessment of strengths, skills, competencies, interests, opportunities, and areas of desired development;
- B. List of professional goals in citizenship, teaching, and scholarship; and plans to accomplish these goals;
- C. The relationship between individual goals and department and university aspirations and needs;
- D. Resources needed to accomplish professional goals;
- E. Activities and accomplishments so far in achieving these goals;

My Faculty Development Plan is presented below, highlighting each of the five points above as they relate to teaching, scholarship, and citizenship.

GENERAL SELF-ASSESSMENT

I feel fortunate to have the opportunity to develop a teaching and research career at BYU. The infrastructure, financial, and personnel support that are invested in my behalf all represent sacred resources to advance the mission of the University. This institutional support represents a major strength to help me achieve my career goals, and I aim to judiciously use these resources to benefit all those I interact with as a faculty member at BYU.

In addition to institutional support, I bring unique skills, talents, and perspectives to BYU and the Department of Biology. I am passionate about biology and helping students develop a love for trying to understand the world around us. Here in Provo, we are fortunate to have easy access to beautiful places and fascinating research opportunities. These factors, coupled with the bright, capable student body at BYU, provide a solid foundation for developing a vibrant, fulfilling career.

TEACHING

1. **Strengths, skills, competencies, interests, and opportunities:** I really enjoy trying to connect with students to help them see the world from a new perspective. I strive to effectively engage students through a variety of active learning approaches, including, inquiry-based activities, writing-to-learn, in-class discussions, and quality lectures. I am committed to providing opportunities for them to succeed. While I generally receive positive student ratings, I welcome constructive feedback from students, peers, and consultants. I try to be flexible and am more than happy to adjust my teaching strategies to better help students succeed. Here at BYU, I thoroughly enjoy teaching biology to non-majors (Bio 100) and look forward to opportunities to teach graduate-level courses (Bio 511, 559R, and a new course on speciation/biogeography).

2. **Areas of desired development:** Without a formal background in science education, I often wish I had a better perspective effective pedagogical approaches for teaching biology. I tend to use same techniques and similar materials for assessing learning as those that I was exposed to as a student. I want to improve my teaching by carefully designing my courses around meaningful learning outcomes and creating effective assessments. To help develop a more effective pedagogical perspective and develop appropriate assessments, I am taking advantage to the resources at BYU's Center for Teaching & Learning (CTL).
3. **Goals and relationships to University and Department aspirations and needs:**
 - a. Goals
 - i. Utilize university, college, and department programs and resources to help me improve as an instructor. Specific examples included workshops and training from the Faculty Center, SCOT & CTL consultants, peer evaluations from other faculty teaching similar courses, and observing effective teachers.
 - ii. Read one book each year about being an effective teacher and in particular on effectively assessing learning.
 - iii. Make regular improvements to the classes I teach based on feedback from my students, faculty peer-review, and CTL consultants. Make arrangements to have my Bio 100 course peer reviewed a second time in Winter 2018.
 - iv. Update and amend my Bio 100 syllabus to include focused reading assignments, promote active learning and in-class engagement.
 - v. Develop a graduate level course focusing on speciation and biogeography, submitting the new class proposal during Summer 2017.
 - b. Relationships to University and Department aspirations and needs
 - i. My overarching aim is that my teaching is intellectually enlarging and spiritually strengthening. My teaching goals above reflect my hope to facilitates students' skills in sound thinking, effective communication, and quantitative reasoning through their study of biology. The design and iterative improvement of the courses I teach must be focused on these principles. As a department, we aim to "create and maintain a dynamic, scholarly environment that fosters, promotes, and enhances learning, research, and service across the spectrum of biological knowledge." Presently there is a need to within our department to expand the range of graduate courses offered and provide additional opportunities for field experience. The speciation course I am currently developing will help add to the breadth of graduate courses offered in our department and help maintain and grow our department's robust systematics group. My Bio 511 course will provide unique and relevant opportunities for field work and research experience.
4. **Resources needed to accomplish professional goals:** The CTL (Mike Johnson and SCOT consultants, specifically) has been a valuable resource to helping me work towards these goals. In addition, my faculty mentors have been generous with their time and sharing their perspectives as they help me improve my teaching. In order to be able to integrate a field component into my Bio 511 course (and maybe some research opportunities for my new speciation course), modest financial support from the department/college/university will be necessary.

5. **Activities and accomplishments in achieving these goals to date, 15 June 16, 2017**
 - a. Midterm course evaluation (Winter 2017)
 - b. SCOT consultation (Spring 2017)
 - c. Peer evaluation (Spring 2017)
 - d. CTL consultation (Winter and Spring 2017)
 - e. Revise syllabus based on student evaluation from Winter 2017

SCHOLARSHIP

1. **Strengths, skills, competencies, interests, and opportunities:** I have been fortunate to develop a vibrant, unique research program that is internationally recognized. Involving students in research is a central component of my research program, and my lab provides outstanding opportunities for students to directly engage in meaningful research. BYU's close proximity to many of my field sites, the M.L Bean Life Science Museum and its outstanding herbarium collections, DNA Sequencing Center, and other resources provide a sound framework for integrating my research interests with students' needs. A central component of my research involves collaborative projects with international colleagues and students worldwide. This approach has fostered creative interdisciplinary interactions among collaborators with diverse training and areas of interest I have a number of ongoing and developing projects with colleagues that address symbioses, speciation, diversity, and the impact of contemporary ecological change in vulnerable habitats.
2. **Areas of desired development:** I currently have a number of great undergraduate students working in my lab. However, none of these students are biology majors, and I hope to recruit more Biology majors to work in my lab. Recruiting majors from my department will enhance student engagement with projects relevant to their interests, in addition to better serving my department. I hope to include more students in all aspects of my research, specifically the components with tangible outcomes, e.g., presentations and publications. While my research program is strong from a phylogenetic systematics perspective, I plan on further developing the ecological/environmental science side of my research. I am currently networking with colleagues on and off campus in order to establish a robust research component relating to biological monitoring and ecological assessments using lichens. Finally, external funding is central to the long-term success of my research program. I am continuing my pursuit of funding through the NSF, USDA Forest Service, and other agencies.
3. **Goals and relationships to University and Department aspirations and needs:**
 - a. Goals
 - i. Continue and develop collaborations with colleagues worldwide with the aim of addressing 'big picture' questions. These collaborations will not only focus on 'big picture' questions but also facilitate unique opportunities for advancing students' academic careers.
 - ii. Regularly attend scientific meetings with students to present our research findings and stay up-to-date on the latest academic developments in my discipline. These meetings include Evolution, Botany, and meetings of various lichenological societies.

- iii. Publish at least three papers each year in relevant, high-impact journals. These may include both broad, general biology journals (e.g., *Evolution*, *Genome Biology and Evolution*, *Journal of Biogeography*, *Molecular Phylogenetics and Evolution*, etc.) and discipline-specific journals (*American Journal of Botany*, *Fungal Diversity*, *Taxon*, *The Lichenologist*, etc.).
 - iv. Advance the careers of my students through helping them present their finding at professional meetings, publishing their findings in peer-reviewed journals, and produce successful grant applications.
 - v. Continue applying for external funding through the NSF, USDA Forest Service, BLM, and other relevant funding agencies. Specifically, I will submit two NSF preliminary proposal each year until I obtain funding.
 - b. Relationships to University and Department aspirations and needs
 - i. My goals in scholarship reflect the high expectations that I have for myself and providing students with transformative research opportunities. My scholarship goals above reflect my hope to mentor students in experiential learning opportunities that will facilitate sound thinking, effective communication, and quantitative reasoning. As a department, we aim to “create and maintain a dynamic, scholarly environment that fosters, promotes, and enhances learning, research, and service across the spectrum of biological knowledge.” I’m confident that my scholarship goals are aligned with the Department’s mission.
4. **Resources needed to accomplish professional goals:** A generous start-up package has been an important part of establishing my research program at BYU. In addition, the department has assigned an appropriate teaching schedule and service opportunities. Overall, my resources have been sufficient to help me hit the ground running. I am grateful to the college, department, and Bean Museum for this support. My hope is that students will have access to funds to support fieldwork and laboratory opportunities and attendance at professional meetings. I am grateful that my students have largely had good support to date. As I progress toward continuing status, I will likely need additional equipment to be successful, but this can be arranged through collaboration with other faculty, grants and capital equipment requests.
5. **Activities and accomplishments in achieving these goals to date, 15 June 16, 2017**
- a. Two NSF preliminary proposals submitted in January 2017 (not invited for full proposals)
 - b. Three air quality bio-monitoring proposals submitted to the USDA Forest Service (pending)
 - c. Two students attending and presenting at the Botany 2017 meetings in Fort Worth, TX (June 2017)
 - d. I am an invited speaker at the IX Congreso Colombiano de Botánica, Tunja, Colombia (August 2017)
 - e. Ongoing collaborations with international colleagues, including three manuscripts currently under review in which I am the lead or corresponding author.
 - f. Eight papers published to date in 2017, with five more currently under review.
 - g. Two manuscripts in preparation with undergraduate students as the lead authors.

CITIZENSHIP

1. **Strengths, skills, competencies, interests, and opportunities:** From a professional standpoint, I am well-connected and actively involved in the lichenological community. I am currently an associate editor for two academic journals, *Phytotaxa* and *The Bryologist*, and currently serve on the American Bryological and Lichenological Society's Executive Committee as the treasurer. These opportunities facilitate networking and collaboration opportunities with colleagues across the nation, and throughout the world. From a personal perspective, I have a pretty laid back personality and generally get along with a wide range of people. I appreciate diverse perspectives and ideas, and hopefully don't act like a jerk too often.
2. **Areas of desired development:** My aim is to find the right balance of citizenship, scholarship, and teaching. I tend to overcommit, stretching myself too thin. I hope to take advantage of the perspective of faculty in my department to find ways to strike the right balance in what I do here at BYU.
3. **Goals and relationships to University and Department aspirations and needs:**
 - a. Goals
 - i. Be an active contributor to the mission of BYU, college, and department. As deemed appropriate with feedback from my mentoring committee, accept invitations to serve effectively on committees at each of these levels.
 - ii. Develop and post a web page for my laboratory group and the Bean Museum's Herbarium of Non-Vascular Cryptogams. This web page will focus on (1) highlighting my research group's role in biodiversity and bio-monitoring research; (2) communicating our research aims to a broad audience; (3) providing a centralized academic resource with data, results, and publications from my lab; and (4) recruiting prospective students and postdocs.
 - iii. Review six manuscripts/year for scientific journals in my discipline.
 - iv. Serve as an associate editor for journals relevant to my discipline.
 - v. Provide letters of recommendation for students from my lab, classes, and other cases where I can provide meaningful insight.
 - vi. Recruit and mentor 4-6 undergraduate students, in addition to recruiting high caliber graduate students and postdocs.
 - b. Relationship to University and Department aspirations and needs
 - i. I believe that my goals will help me stay aligned with the aims of the University, College and Biology Department. Specifically, leading to my "contribution toward the balanced development of the total person" and "bring strength to others in tasks of home and family life, social relationships, civic duty, and service to mankind."
4. **Resources needed to accomplish professional goals:** I appreciate the careful consideration of my department chair in assigning an appropriate level of service opportunities at BYU. Furthermore, my faculty mentors have provided judicious advice in terms of I do not anticipate that any resources will be needed.

- 5. Activities and accomplishments in achieving these goals to date, 15 June 16, 2017**
- a. Reviewed ten manuscripts to date
 - b. Serve as associate editor for *Phytotaxa* and *The Bryologist*
 - c. Served on the Graduate Research Fellowship review committee for the College of Life Sciences (March 2017)
 - d. Served on the Journal Evaluation Committee as the department representative (December 2016)

SCHOLARSHIP STRATEGIES PROJECT PROPOSAL

Paragraph from FDP

I have been fortunate to develop a vibrant, unique research program that is internationally recognized. Involving students in research is a central component of my research program, and my research program provides outstanding opportunities for students to directly engage in meaningful research. BYU's close proximity to many of my field sites, the M.L Bean Life Science Museum and its outstanding herbarium collections, DNA Sequencing Center, and other resources provide a sound framework for integrating my research interests with students' needs. A central component of my research involves collaborative projects with international colleagues and students worldwide. This approach has fostered creative interdisciplinary interactions among collaborators with diverse training and areas of interest I have a number of ongoing and developing projects with colleagues that address symbioses, speciation, diversity, and the impact of contemporary ecological change in vulnerable habitats.

Specific goals to be completed by February 2018:

1. Submit two preliminary proposals to the National Science Foundation (due date: January 2018).
 - a. Diversity and distributions of lichen-forming algae with international colleagues
 1. Share drafts with colleagues before the end of November
 - b. Diversification dynamics in the largest genus of lichen-forming fungi
 1. Meet with co-PIs in Chicago in November to polish up the proposal
2. Mentor a current undergraduate student in preparing and submitting a manuscript for publication in *Organisms Diversity & Evolution* (target date: December 2017).
3. Submit two manuscripts from my lab for review/publication
 - a. Mitochondrial genome evolution in lichen-forming fungi (*Genome Biology and Evolution*)
 - b. Multi-locus phylogeny of the most common lichen photobiont genus, *Trebouxia* (*Molecular Phylogenetics and Evolution*)
4. Establish two solid research projects for undergraduate students to present at the ABLs meetings in 2018

Strategies of scholarly productivity:

Meeting the goals in my "Scholarship Strategies Project Proposal", will require extensive writing, effective student mentoring, long-distance collaborations with colleagues. My strategies will center around these three components.

1. Set aside regular protected time for writing (MWF, 7–8:30am).
 - a. Submit a draft of our "Multi-locus phylogeny of the most common lichen photobiont genus, *Trebouxia*" manuscript to colleagues by September 30, 2017.
 1. Submit to journal by October 31, 2017
 - b. Submit a draft of our "Mitochondrial genome evolution in lichen-forming fungi" manuscript to colleagues by October 31, 2017
 1. Submit to journal by November 30, 2017
2. Conduct weekly meetings with individual student employees and bi-monthly meetings with my entire lab group.

- a. Focus on mentoring the preparation of our 'metacommunity barcoding' manuscript for submission. Target date for manuscript submission: December 2017.
 - b. Focus on promoting student ownership of specific projects.
3. Contact collaborators bi-monthly to coordinate current research and for updates on our progress.
 - a. Work to identify and develop other collaborative projects with colleagues.

Evaluating success:

Each of my goals has clear, measurable outcomes, including the submission of three manuscripts, two grant proposal submissions, and establishing two research projects for undergraduate students. Similarly, my strategies for scholarly productivity have clear measurable outcomes. I will set realistic weekly goals tied to my strategies for scholarly productivity and reevaluate progress each Friday.

CITIZENSHIP PROJECT PROPOSAL

From a professional standpoint, I am well-connected and actively involved in the lichenological community. I am currently an associate editor for two academic journals and currently serve on the American Bryological and Lichenological Society's Executive Committee as the treasurer. These opportunities facilitate networking and collaboration opportunities with colleagues across the nation, and throughout the world. However, I tend to overcommit, stretching myself too thin. I hope to take advantage of the perspective of faculty in my department to find ways to find an appropriate balance.

I propose the following goals and activities to become a better colleague and citizen of the BYU community:

Goals/Activities to complete by February 2018

- Have lunch with a colleague in the College of Life Sciences at least twice a month.
- Get to know members of my department by observing two classes of colleagues who also teach Bio 100
 - Meet with them afterwards to discuss what has worked well for them and what remains challenging
- Actively participate in department and college seminars during Fall 2017.

COURSE DEVELOPMENT PROJECT GRANT PROPOSAL

In order to enhance learning in my Bio 511 course (Lichenology), I am requesting \$300 to purchase a soil DNA isolation kit (DNeasy PowerMax Soil Kit, \$246.00). This kit is crucial for characterizing the biological diversity at bio-monitoring reference sites using DNA barcode identification. The remaining \$54 will be used to purchase consumables, like plastic tips, tubes, etc. For this course, we aim to compare the accuracy of DNA barcode identification with traditional taxonomic inventories. Students will be encouraged to use this data to prepare a manuscript for submission to the peer-reviewed journal, *The Bryologist*.

COURSE SYLLABUS

BIO 100 - Principles of Biology

Spring 2017 – Section 001: 221 MARB on M W F from 9:00 am - 10:50 am

Instructor Information

Dr. Name

4143 LSB: 4143 LSB

801-422-4879: 801-422-4879

Office Hours: Wed 11:00am-12:15pm, or by appointment

email: Name@byu.edu

TA Information

Keilen Kelly – email: keilenkelly326@gmail.com

4143 LSB: 2056 LSB

Office Hours: Mon, Tue, Wed, Fri 11:00am-12:00pm

Kathryn Graham – email: katgraham16@gmail.com

4143 LSB: 2056 LSB

Office Hours: Tue 12:30pm-2:30pm; Thu 11:00am-1:00pm

Matt Swanson – email: mswanso94@gmail.com

4143 LSB: 2056 LSB

Office Hours: Fri 11:00am-12:00pm

Course Information

Description

This course is designed to help you develop character traits, intellectual abilities, and *basic* literacy in the biological sciences; to learn to “think clearly, communicate effectively, and act wisely” as stewards and citizens in your home, community, and the world. (*The Value of a General Education*, BYU)

Learning Outcomes:

Biology Literacy: Students will acquire basic literacy in the language of science and biology as evidenced by their ability to: Explain the foundational assumptions underlying science and evaluate the strengths and limitations of science as a human endeavor. Describe basic principles and concepts of biology using appropriate vocabulary. Describe data represented textually, numerically, and graphically, and infer a conclusion from the data. Plan and perform a simple experiment, actual or simulated; draw conclusions, and; communicate the results.

Scientific Reasoning: Students will exercise sound scientific reasoning as evidenced by their ability to: Evaluate scientific evidence and claims at the level of a well-informed layperson in order to make rational decisions on public-policy science issues. Develop intellectual abilities and character traits of sound judgment and effective communication.

Personal Responsibility: Students will accept responsibility for personal and public stewardship as evidenced by their ability to: Integrate sound scientific reasoning with reasoning and methods from other disciplines to address real-world biology-related issues and concerns. Reflect on how literacy in biology and sound scientific reasoning combine with reasoning and methods from other disciplines to increase their ability to act responsibly as stewards and citizens in their own families, communities and the world.

A defining characteristic of these learning outcomes is a focus on *how we know*. Thoughtful adults need to know how to think rather than memorize “facts”. This does not mean that learning “content” is not necessary. This means that the knowledge of content and how it applies to biological principles along with the ability to use this knowledge in the broader context of application to personal and public policy issues is the hallmark of an educated person.

Acquire basic literacy and technical skills in the language of science in general and biology in particular –

Students will be able to:

1. Develop basic technical skills for effective analysis, interpretation, and synthesis of data.
2. Describe basic principles and concepts of biology using appropriate vocabulary.
3. Analyze and interpret data represented textually, numerically, and graphically, and draw conclusions from the data.
4. Plan and perform a *simple* experiment and effectively communicate conclusions.

Exercise sound scientific reasoning –

Students will be able to:

1. Evaluate evidence and claims at the level of a well-informed layperson in order to make rational decisions on science-related public-policy and moral issues.
2. Develop intellectual abilities and character traits in order to strengthen the quality of their personal judgments and interpersonal interactions*.
3. Access reliable information for evaluating the credibility of scientific claims.

Accept responsibility for personal and public stewardship –

Students will be able to:

1. Integrate sound analysis and interpretation with the reasoning patterns and methods used in other disciplines to more effectively address real-world biology-related issues and concerns.
2. Reflect on how literacy in biology and sound scientific analysis and interpretation integrate with the reasoning patterns and methods used by other disciplines to enhance their ability to act responsibly as stewards and citizens in their family, community, and the world.

Develop intellectual character –

Students will be able to:

1. Expand their existing knowledge, experience, and intellectual ability regardless of potential intellectual discomfort (Intellectual Humility).
2. Understand and appraise the interpretations, positions, models, and theories of others without necessarily agreeing with or accepting them (Intellectual Empathy).
3. Explore, analyze, interpret, develop, and apply one's own knowledge, beliefs, and character in strict conformity to high ethical standards even in the face of obstacles, unpopularity, or opposition (Intellectual Integrity).
4. Hold in abeyance a final resolution to a problem or issue or accept provisionally a conclusion or position pending additional information or insight (Intellectual Patience).
5. Assist others in their intellectual development while consistently applying intellectual knowledge, skill, and effort for the eternal and temporal benefit of humankind (Intellectual Charity).

Grading Policy

There is no penalty for late assignments due to **serious personal illness**, **family emergencies**, or **University excused absences** if proper documentation is provided. However, timely submission of late assignments due to illness, family emergencies, or university excused absences is required. In all other cases, late assignments will be accepted, at a 20% reduction in points, for up to 3 days from the day the assignment was originally due. For example, if an assignment is due on Friday – the last possible date for submitting a late assignment for reduced points will be the following Monday at the end of class. No late assignments will be accepted after 3 days except for situations where personal illness, family emergency-related issues, or university excused absences can be clearly documented. We expect that you will inform us as soon as possible (by email) if you are not able to submit an assignment on time.

Grades	Percent
A	93%
A-	90%
B+	87%
B	83%
B-	80%
C+	77%
C	73%
C-	70%
D+	67%
D	63%
D-	60%
E	0%

Examinations must be taken within the designated time frame – no late exams will be given except in those cases where serious illness, family emergencies, or university excused absences can be appropriately documented.

Group presentations must be done at the scheduled times – no exceptions.

Final grades are determined relative to the established grading scale. You **will** receive the letter grade corresponding to your earned percentage points and will not be awarded a higher grade, even if you are really, really close to earning a higher letter grade.

Attendance Policy: Attendance and participation in all class sessions is essential, especially given the limited time in Spring term. I urge you to carefully to complete the "Before-class" preparation assignments (readings, videos, etc.) before you come to class - see class schedule for specific assignments. To encourage thoughtful participation, a total of six '**Just-in-time**' assignments are required before the end of the term (5 points each). These assignments must be submitted before class and can be completed any time during the semester. However, only one '**Just-in-time**' assignment can be submitted for each class session. In addition, seven '**What's your perspective?**' assignments are scheduled throughout the terms. These are low-stakes writing assignments, coupled with in-class participation, designed to encourage thoughtful engagement and dialogue relating to relevant biological topics. Finally, we will use **concept mapping** to characterize relationships among concepts and ideas, with three low-stakes group assignments scheduled during class sessions. These low-stakes activities are a central part of the class and are implemented for the simple reason that participation in discussions significantly increases learning.

Study Habits

- Consistently attend all class sessions
- Organize and consistently study with a group
 - People learn more effectively and retain the information longer if they get involved in out-of-class study groups. To succeed in this class I highly recommend you establish a study group.
- Stay current with assigned reading materials and thoughtfully complete them **before class**

- Take careful notes during class
 - Carefully review class notes, at least twice weekly
 - Actively participate in test review sessions
 - Complete and submit all assignments on time
-

Assignments

'Just-in-time' questions (30 total points, 5 points each): A total of six **'Just-in-time'** assignments are required before the end of the term (**5 points each**). These assignments must be submitted before class, through Learning Suite, and can be completed any time during the semester. However, only one **'Just-in-time'** assignment can be submitted for each class session.

The assignment requires you to thoughtfully engage with course material (listed on the course Schedule) in order to be prepared and meet learning outcomes. Specifically, you are required to **generate three thoughtful questions** related to the material that will be covered **that day**. The questions may refer to related material or concepts that have not yet been covered in the course (or assigned reading material); concepts or ideas that remain unclear *after* completing the before-class reading assignments; questions relating to connections between spiritual, political, economical, etc. issues to the course material; etc. Questions should not be related to concepts or terms that can simply be looked up in a textbook/Wikipedia/etc.

The major focus of this assignment is to improve your preparation for class. If you are thoughtfully preparing for class by completing the reading assignments before class, this assignment should not require more than a few additional minutes to complete. The grading criteria is simply that the **'Just-in-time'** questions reflect thoughtful before-class participation, and will be assessed by Professor Name and TAs.

The aims of the "Just-in-time" questions assignments are to:

- Improve students' preparation for class
- Enhance student motivation for learning
- Promote ongoing formative assessment of student learning (by both instructors and students)
- Inform in-class activities that target student learning gaps

"What's your perspective" (70 total points, 10 points each): 'What's your perspective?' assignments are scheduled throughout the term. These are low-stakes writing assignments, coupled with in-class participation, are designed to encourage thoughtful engagement and dialogue relating to relevant biological topics (see specific assignments and associated grading criteria).

1. WYP #1
 - available in Learning Suite, under the "Assignment" tab
 - **DUE** 05 May (see assignment details)
2. WYP #2
 - available in Learning Suite, under the "Assignment" tab
 - **DUE** 15 May (see assignment details)
3. WYP #3
 - available in Learning Suite, under the "Assignment" tab
 - **DUE** 17 May (see assignment details)
4. WYP #4
 - available in Learning Suite, under the "Assignment" tab

- **DUE** 22 May (see assignment details)
- 5. WYP #5
 - available in Learning Suite, under the "Assignment" tab
 - **DUE** 07 June (see assignment details)
- 6. WYP #6
 - available in Learning Suite, under the "Assignment" tab
 - **DUE** 12 June (see assignment details)
- 7. WYP #7
 - available in Learning Suite, under the "Assignment" tab
 - **DUE** 14 June (see assignment details)

"Concept mapping" in-class activities (15 total points, 5 points each): we will use **concept mapping** to illustrate relationships among concepts and ideas, with three low-stakes group assignments scheduled during class sessions.

- In-class participation is required to obtain points for the group concept mapping assignments
- 1. Concept mapping #1 - Science as a way of knowing
 - **DUE** May 8th, end of class (group assignment)
- 2. Concept mapping #2 - Adaptation, speciation and genetic diversity
 - **DUE** May 24th, end of class (group assignment)
- 3. Concept mapping #3 - Ecosystems - energy flow & nutrient cycling
 - **DUE** May 31st, end of class (group assignment)

"Consider and communicate" (75 total points, 25 points each):

These assignments are intended to provide you with a unique opportunity to explore specific and relevant biological themes in depth. Each 'consider and communicate' assignment will consist of an in-class exploration of a specific topic and an individual write-up described for each assignment. A major goal for this assignment is to help you develop effective written communications skills, especially when dealing with concepts that may personally be relatively new or previously under-explored.

You will be required to carefully develop this assignment (see grading guides for specific criteria), and I encourage students to consult the BYU Writing Center.

- BYU Writing Center Handouts: <http://writingcenter.byu.edu/handouts/>
 - Organization
 - Style
- 1. C & C 1 - Termite Behavior: Using the Scientific Method to "Know" (25 points possible)
 - available in Learning Suite, under the "Assignment" tab
 - Due May 8th, before class – submit through Learning Suite
- 2. C & C 2 - Education in Zion (25 points possible)
 - available in Learning Suite, under the "Assignment" tab
 - Due May 15th, before class – submit through Learning Suite
- 3. C & C 3 - Candy Cladistics (25 points possible)
 - available in Learning Suite, under the "Assignment" tab
 - Due May 22th, before class – submit through Learning Suite

Bio100 Group Project (125 points, total)

- Working in groups of five people, you will conduct research on an interesting, underexplored, or controversial biological issue.
 - Your issue and your partners will be assigned by the instructor with your input.

- You will prepare a portfolio documenting your preparation for your group project
 - Although this is a group project, each individual will be required to turn-in their own portfolio.
- You will present this research in a video format (see the “It’s Okay to Be Smart” series on YouTube (<https://www.youtube.com/user/itsokaytobesmart>)).
 - 5-7 minute video
 - Your team will be required to submit a written summary (abstract – ca. 250 words), as well as an outline and bibliography
 - presented for our final, June 21st, 9–10:50 am (221 MARB) - **attendance required.**
- Each student will be required to provide feedback for each group’s presentation
 - See “peer-evaluation” grading criteria

The portfolio will be comprised of four parts and is worth a total of 35 points.

1. Part 1 (10 points) – Project Topic: **due Friday, 26 May 2017**
2. Part 2 (5 points) – Project Brainstorm & the 'pitch': **due Friday, 02 June 2017**
3. Part 3 (5 points) – Project Storyboard: **due Friday, 09 June 2017**
4. Part 4 (15 points) – Project Abstract & References: **due Friday, 16 June 2017**

The presentation is worth a total of 90 points

- Digital file with your video must be submitted by **Monday, 19 June 2017**
- To received credit for the group presentation (**all or nothing**), students must be present for the all group presentations
 - **Wednesday, June 21st, 9–10:50 am (221 MARB)**
 - Submit peer-evaluations for all presentations.

EXAM

Exam - multiple choice & short answer

Due: Wednesday, May 24th - Friday, May 26 at the Testing Center

University Policies

Honor Code

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and every instructor's expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

Preventing Sexual Misconduct

As required by Title IX of the Education Amendments of 1972, the university prohibits sex discrimination against any participant in its education programs or activities. Title IX also prohibits sexual harassment-including sexual violence-committed by or against students, university employees, and visitors to campus. As outlined in university policy, sexual harassment, dating violence, domestic violence, sexual assault, and stalking are considered forms of "Sexual Misconduct" prohibited by the university. University policy requires any university employee in a teaching, managerial, or supervisory role to report incidents of sexual misconduct that come to their attention through various forms including face-to-face

conversation, a written class assignment or paper, class discussion, email, text, or social media post. If you encounter Sexual Misconduct, please contact the Title IX Coordinator at t9coordinator@byu.edu or 801-422-2130 or Ethics Point at <https://titleix.byu.edu/report> or 1-888-238-1062 (24-hours). Additional information about Title IX and resources available to you can be found at <http://titleix.byu.edu>.

Student Disability

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability which may impair your ability to complete this course successfully, please contact the University Accessibility Center (UAC), 2170 WSC or 422-2767. Reasonable academic accommodations are reviewed for all students who have qualified, documented disabilities. The UAC can also assess students for learning, attention, and emotional concerns. Services are coordinated with the student and instructor by the UAC. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures by contacting the Equal Employment Office at 422-5895, D-285 ASB.

Academic Honesty

The first injunction of the Honor Code is the call to "be honest." Students come to the university not only to improve their minds, gain knowledge, and develop skills that will assist them in their life's work, but also to build character. "President David O. McKay taught that character is the highest aim of education" (The Aims of a BYU Education, p.6). It is the purpose of the BYU Academic Honesty Policy to assist in fulfilling that aim. BYU students should seek to be totally honest in their dealings with others. They should complete their own work and be evaluated based upon that work. They should avoid academic dishonesty and misconduct in all its forms, including but not limited to plagiarism, fabrication or falsification, cheating, and other academic misconduct.

Mental Health Concerns

Mental health concerns and stressful life events can affect students' academic performance and quality of life. BYU Counseling and Psychological Services (CAPS, 1500 WSC, 801-422-3035, caps.byu.edu) provides individual, couples, and group counseling, as well as stress management services. These services are confidential and are provided by the university at no cost for full-time students. For general information please visit <https://caps.byu.edu>; for more immediate concerns please visit <http://help.byu.edu>.

Plagiarism

Intentional plagiarism is a form of intellectual theft that violates widely recognized principles of academic integrity as well as the Honor Code. Such plagiarism may subject the student to appropriate disciplinary action administered through the university Honor Code Office, in addition to academic sanctions that may be applied by an instructor. Inadvertent plagiarism, which may not be a violation of the Honor Code, is nevertheless a form of intellectual carelessness that is unacceptable in the academic community. Plagiarism of any kind is completely contrary to the established practices of higher education where all members of the university are expected to acknowledge the original intellectual work of others that is included in their own work. In some cases, plagiarism may also involve violations of copyright law. Intentional Plagiarism-Intentional plagiarism is the deliberate act of representing the words, ideas, or data of another as one's own without providing proper attribution to the author through quotation, reference, or footnote. Inadvertent Plagiarism-Inadvertent plagiarism involves the inappropriate, but non-deliberate, use of another's words, ideas, or data without proper

attribution. Inadvertent plagiarism usually results from an ignorant failure to follow established rules for documenting sources or from simply not being sufficiently careful in research and writing. Although not a violation of the Honor Code, inadvertent plagiarism is a form of academic misconduct for which an instructor can impose appropriate academic sanctions. Students who are in doubt as to whether they are providing proper attribution have the responsibility to consult with their instructor and obtain guidance. Examples of plagiarism include: Direct Plagiarism-The verbatim copying of an original source without acknowledging the source. Paraphrased Plagiarism-The paraphrasing, without acknowledgement, of ideas from another that the reader might mistake for the author's own. Plagiarism Mosaic-The borrowing of words, ideas, or data from an original source and blending this original material with one's own without acknowledging the source. Insufficient Acknowledgement-The partial or incomplete attribution of words, ideas, or data from an original source. Plagiarism may occur with respect to unpublished as well as published material. Copying another student's work and submitting it as one's own individual work without proper attribution is a serious form of plagiarism.

Respectful Environment

"Sadly, from time to time, we do hear reports of those who are at best insensitive and at worst insulting in their comments to and about others... We hear derogatory and sometimes even defamatory comments about those with different political, athletic, or ethnic views or experiences. Such behavior is completely out of place at BYU, and I enlist the aid of all to monitor carefully and, if necessary, correct any such that might occur here, however inadvertent or unintentional. "I worry particularly about demeaning comments made about the career or major choices of women or men either directly or about members of the BYU community generally. We must remember that personal agency is a fundamental principle and that none of us has the right or option to criticize the lawful choices of another." President Cecil O. Samuelson, Annual University Conference, August 24, 2010 "Occasionally, we ... hear reports that our female faculty feel disrespected, especially by students, for choosing to work at BYU, even though each one has been approved by the BYU Board of Trustees. Brothers and sisters, these things ought not to be. Not here. Not at a university that shares a constitution with the School of the Prophets." Vice President John S. Tanner, Annual University Conference, August 24, 2010

Late Assignment/Exam

There is no penalty for late **assignments** due to serious personal illness, family emergencies, or University excused absences if proper documentation is provided. However, timely submission of late assignments due to illness, family emergencies, or university excused absences is required. In all other cases, late assignments will be accepted, at a 20% reduction in points, for up to 3 days from the day the assignment was originally due. For example, if an assignment is due on Friday – the last possible date for submitting a late assignment for reduced points will be the following Monday at the end of class. No late assignments will be accepted after 3 days except for situations where personal illness, family emergency-related issues, or university excused absences can be clearly documented. We expect that you will inform us as soon as possible (by email) if you are not able to submit an assignment on time. **Examinations** must be taken within the designated time frame – no late exams will be given except in those cases where serious illness, family emergencies, or university excused absences can be appropriately documented.

Schedule

Date	Column 1	Column 2
W May 03 Wednesday		<p>L1: Introduction <i>Before-class prep:</i> Bio100 syllabus – available on Learning Suite “What is Truth”: https://www.lds.org/broadcasts/article/ces-devotionals/2013/01/what-is-truth?lang=eng “Why facts don’t change our mind”: http://www.newyorker.com/magazine/2017/02/27/why-facts-dont-change-our-minds BYU Writing Center Handouts: http://writingcenter.byu.edu/handouts/Organization Style Learning activities: Get involved, ask questions, introduce yourself to classmates, tell each other what you hate most about biology, etc. Assignments/reminders: Review course syllabus (learning outcomes, policies, expectations, assignments, schedule, exam, and final project) Keep up-to-date with reading, completing the assignments before class Remember to complete a total of six ‘Just-in-time’ assignments before the end of the term (5 points each).</p> <p>L1_03May2017L1_03may2017.pptx Download</p>
F May 05 Friday	WYP #1	<p>L2_05may2017_vf.pptx Download</p> <p>L2: How do we do science? <i>Before-class prep:</i> “Mistrust of science: http://www.newyorker.com/news/news-desk/the-mistrust-of-science Hypothesis design: http://www.public.asu.edu/~kroel/www500/hypothesis.pdf “WYP 1 – Don’t Believe Everything That You Read” assignment – available on Learning Suite https://scienceornot.net/2012/08/09/trusting-the-science/ Learning activities WYP in-class discussion C&C #1: Termites – available on Learning Suite Assignments/reminders ‘WYP 1’ (10 points), due TODAY Keep up-to-date with reading, completing the assignments before class</p>

Remember to complete a total of six 'Just-in-time' assignments before the end of the term (5 points each).

M May 08
Monday

C&C #1
concept mapping #1

L3: Science as a Way of Knowing (Dr. St. Clair)

Before-class prep:

"Science as Storytelling":

http://serendip.brynmawr.edu/sci_cult/scienceis/bickmoregrandy.html

Faith and Science as Ways of Knowing: Dealing with the Ostensible Conflicts,
Larry L. St. Clair PhD – Faith_and_Science_StClair.doc Download

Concept Maps –

http://library.appstate.edu/sites/all/files/video/handouts/conceptmap_0.pdf

concept map brief description: Concept Map document Spring 2017.pdf Download
concept map.pptx Download

Learning activities:

Concept mapping – be sure to have completed the reading assignments before class

Assignments/reminders:

C&C #1 (25 points), due **TODAY** before class – submit through Learning Suite
Concept mapping #1 (5 points) – submit at the end of class **TODAY**

L3_08May17_1ls.ppt Download

W May 10
Wednesday

L4: The Chemistry of Life (Dr. St. Clair)

Before-class prep:

"The Recipe for Life": <https://www.youtube.com/watch?v=tuBWjY9BpEc>

OpenStax Biology, Ch. 3 (3.1, 3.2, 3.3, 3.4, & 3.5):

<https://openstax.org/details/biology>

Learning activities:

Ask questions, participate, etc. Have you submitted 'Just-in-time' questions yet?

Assignments/reminders:

Keep up-to-date with reading, completing the assignments **before class**

Remember to complete a total of six 'Just-in-time' assignments before the end of the term (5 points each).

L4a_10May2017.ppt Download

L4a_10May2017_LLS.docx Download

F May 12
Friday

L5: Education in Zion (meet at gallery in JFSB @10 am)

Before-class prep:

C&C #2: Education in Zion – available on Learning Suite

"What is truth?" <https://www.lds.org/broadcasts/article/ces-devotionals/2013/01/what-is-truth?lang=eng>

'Character Building' section <http://aims.byu.edu/aims>

"Learning and Latter-day Saints" <https://www.lds.org/ensign/2009/04/learning-and-latter-day-saints?lang=eng>

"Character - the Aim of Education" <https://speeches.byu.edu/speakers/ted-e-brewerton/>

Learning activities:

"Education in Zion" Gallery in the Joseph F. Smith building

Assignments/reminders:

Today we will be meeting at **10 am at the Education in Zion** gallery (JFSB)

Complete the C&C #2 assignment, due Monday, May 15th (before class).

M May 15
Monday

C&C #2
WYP #2

L6: Evaluating Evidence – Exploring Evolution & an LDS perspective

Before-class prep:

BYU's Evolution

packet: https://nelsonlab.byu.edu/Portals/27/docs/BYU_Evolution_Packet_only.pdf

A cases study: <https://evolution-outreach.springeropen.com/articles/10.1186/s12052-015-0051-6>

(read the abstract, discussion, and conclusions)

Video of Dr. Steve Peck's Summerhays Lecture:

<https://www.youtube.com/watch?v=Rt5ScYA0Bww>

"WYP 2 – Exploring evolution"

Learning activities:

WYP in-class discussion

Assignments:

C&C #2 (25 points), due **TODAY** before class – submit through Learning Suite

'WYP 2' (10 points), due **TODAY**

L6_15may2017.pptx Download

W May 17
Wednesday

WYP #3

L7: Inheritance and Genetics

Before-class prep:

<http://learn.genetics.utah.edu/content/basics/>

"What are traits"

"What are DNA and genes?"

"What are proteins?"

"What is inheritances?
"What is mutation?
"Sexual vs. asexual reproduction"
Is inheritance really all in our genes?
<https://www.youtube.com/watch?v=81rFpRsF80c&t=4s>
"WYP 3 – Inheritance"
Learning activities
Inheritance in practice: Mendelian genetics & Punnett squares
Assignments
'WYP 3' (10 points), due **TODAY**

L7_17may2017.pptx Download

F May 19
Friday

L8_v1_winter2013.pptx Download

L8: The Tree of Life & Ways of Change: Tree Thinking

Before-class prep:

Tree thinking: <https://www.youtube.com/watch?v=Y6KBerIGIEY>

Phylogenetics – An Introduction:

<https://www.ebi.ac.uk/training/online/course/introduction-phylogenetics>

"C&C #3: Candy Cladistics" – available on Learning Suite

Learning activities

Candy Cladistics"

Assignments

Keep up-to-date with reading, completing the assignments **before class**

Remember to complete a total of six 'Just-in-time' assignments before the end of the term (5 points each).

Complete the C&C #3 assignment, due Monday, May 22th (before class).

M May 22
Monday

C&C #3
WYP #4

L9_22may2017.pptx Download

L9: The Tree of Life & Ways of Change: Evolution's Raw Materials

Before-class prep:

Mutations – the potential power of small change:

<https://www.youtube.com/watch?v=GieZ3pk9YVo>

Protein function: <https://www.nature.com/scitable/topicpage/protein-function-14123348>
'WYP 4' – available on Learning Suite
Learning activities
How to read a scientific article
Assignments
C&C #3 (25 points), due **TODAY** before class – submit through Learning Suite
'WYP 4' (10 points), due **TODAY**

W May 24 **concept mapping #2**
Wednesday **Exam 1 - multiple choice Opens**

L10_24may2017.pptx Download

L10: Adaptation, speciation and genetic diversity

Before-class prep:

What Darwin Never Knew: <https://www.youtube.com/watch?v=ov00SrBwjKQ> (you only need to listen up to 1:22:10)

Misconceptions about natural selection/adaptation –

link: http://evolution.berkeley.edu/evolibrary/misconceptions_teacherfaq.php

Misconceptions about evolutionary theory and processes

Misconceptions about natural selection and adaptation

Misconceptions about evolutionary trees

Misconceptions about population genetics

Misconceptions about evolution and the nature of science

Learning activities

Drift and selection

Artificial selection (Six Classroom Exercises to Teach Natural Selection to Undergraduate Biology Students)

Concept mapping

Assignments

Concept mapping #2 (5 points) – submit at the end of class **TODAY**

F May 26 **Exam 1 - multiple choice Closes**
Friday **Exam 1 - short answer (administered with the multiple choice portion in the Testing Center)**

L11_26may2017.pptx Download

L11: Introducing Bio 100 group projects

Before-class prep:

Final Project Summary – available on Learning Suite

Final Project Portfolio, Part 1 – available on Learning Suite

Information Evaluation – available on Learning Suite

Learning activities

Information Evaluation
Final Project Portfolio, Part 1
Assignments
Keep up-to-date with reading, completing the assignments **before class**
Remember to complete a total of six 'Just-in-time' assignments before the end of the term (5 points each).
Final Project Portfolio, Part 1 – topic (15 points), due **TODAY**

M May 29
Monday **Memorial Day
Portfolio - Part 1**

W May 31
Wednesday **concept mapping #3**

L12_31may2017.pptx Download

L12: Ecosystems - energy flow & nutrient cycling

Before-class prep:

“How many trees are there?”:

<https://www.youtube.com/watch?v=NvZiC8JA8Fw&t=260s>

Ecosystem ecology: <https://www.youtube.com/watch?v=v6ubvEJ3KGM>

OpenStax Biology: Chapter 46.1 & 46.2: <https://openstax.org/details/biology>

Learning activities

Concept mapping - Photosynthesis and other autotrophic strategies

Assignments

Concept mapping #3 (5 points) – submit at the end of class **TODAY**

F Jun 02
Friday **Portfolio - Part 2**

L13: Communities and species interactions

Before-class prep:

OpenStax Biology: Chapter 45.4 & 45.6: <https://openstax.org/details/biology>

Community Ecology: <https://www.youtube.com/watch?v=GxE1SSqbSn4>

Learning activities

Final Project Portfolio, Part 2

Assignments

Final Project Portfolio, Part 2 – brainstorm (5 points), due **TODAY**

L13_02june2017.pptx Download

M Jun 05
Monday

L14: Invasive species & human impact

Before-class prep:

“The Dirty Dozen”: https://www.washingtonpost.com/news/energy-environment/wp/2015/02/23/like-most-invasive-species-pythons-are-in-the-u-s-to-stay/?utm_term=.2ffb6a5adc1f
Cheatgrass: http://www.columbia.edu/itc/cerc/danoff-burg/invasion_bio/inv_spp_summ/Bromus_tectorum.html
Link: <https://www.nwf.org/Wildlife/Threats-to-Wildlife/Invasive-Species.aspx>
Learning activities
“outdoor tour”
Assignments
Keep up-to-date with reading, completing the assignments **before class**
Remember to complete a total of six ‘Just-in-time’ assignments before the end of the term (5 points each).

L14_05june2017.pptx Download

W Jun 07 **WYP #5**
Wednesday

L15_07june2017.pptx Download

L15: Symbiosis

Before-class prep:

<http://learn.genetics.utah.edu/content/microbiome/symbiosis>

<http://www.biology-pages.info/S/Symbiosis.html>

‘WYP 5’ – available on Learning Suite

Learning activities

Your microbiome

Assignments

WYP 5 (10 points), due **TODAY**

F Jun 09 **Portfolio - Part 3**
Friday

L16: Microbiomes, holobionts & individuality

Before-class prep:

“We have never been individuals”:

http://www.jstor.org/stable/10.1086/668166?seq=1#page_scan_tab_contents

Holobionts: <http://symbioticism.blogspot.com/2015/06/what-are-holobionts-and-hologenomes.html>

“The invisible creatures that keep you alive”:

<https://www.youtube.com/watch?v=xEo3N9EOpgw>

Learning activities

Group project preparation

Assignments

Keep up-to-date with reading, completing the assignments **before class**
Remember to complete a total of six 'Just-in-time' assignments before the end of the term (5 points each).
Final Project Portfolio, Part 3 – outline (5 points), due **TODAY**

L16_09june2017.pptx Download

M Jun 12
Monday

WYP #6

L17: Biotechnology – emergence of diseases & personal “-omics”

Before-class prep:

WYP 6 – available on Learning Suite

Ethics of cloning: <http://lssjournal.springeropen.com/articles/10.1186/2195-7819-10-3>

iPOP: <https://www.youtube.com/watch?v=JFunUF2lnC8>

Learning activities

WYP 6

Assignments

WYP 6 (10 points), due **Today**

W Jun 14
Wednesday

WYP #7

L18_14june2017.pptx Download

L18 (Wednesday, June 14): Biodiversity & Extinctions

Before-class prep:

WYP 7 – available on Learning Suite

Biodiversity and conservation, Chapter 47: <https://openstax.org/details/biology>

Learning activities

WYP 7 @ Bean Museum

Assignments

WYP 7 (10 points), due **Today**

F Jun 16
Friday

"just-in-time" 1
"just-in-time" 2
"just-in-time" 3
"just-in-time" 4
"just-in-time" 5
Portfolio - Part 4
"just-in-time" 6

L19: Economics & Conservation

Before-class prep:

Environmental Stewardship and Economic Prosperity by Donald A. Adolphson – <https://rsc.byu.edu/archived/stewardship-and-creation/environmental-stewardship-and-economic-prosperity>

OpenStax Biology: Chapter 47: <https://openstax.org/details/biology>

Learning activities

Wedges

Assignments

Keep up-to-date with reading, completing the assignments **before class**
Remember to complete a total of six 'Just-in-time' assignments before the end of the term (5 points each).
Final Project Portfolio, Part 4 – abstract (15 points), due **Today**

M Jun 19
Monday

L20: An LDS perspective on Stewardship

Before-class prep:

Mormon Newsroom: <http://www.mormonnewsroom.org/article/environmental-stewardship-conservation>

"Wandering from the Promised Land":

<https://www.youtube.com/watch?v=3rttbQwkjW0>

Learning activities

Assignments

Digital file with your video must be submitted before the end of class.

Last day to submit a 'Just-in-time' assignment.

T Jun 20
Tuesday

Spring Exam Preparation (06/20/2017 - 06/20/2017)

W Jun 21
Wednesday

First Day of Spring Final Exams (06/21/2017 - 06/22/2017)

FINAL PROJECT PRESENTATION

Each student must submit peer-evaluations for all presentations

Final Exam:
221 MARB
9:00am - 10:50am

"Video" - peer evaluation

