**COURSE SYLLABUS**

**BSC3017 - Theory and Practice in Biological Sciences**

Online Instruction 0635 (SUMMER 2024)

# WELCOME

Welcome to Theory and Practice in Biological Sciences.

Please read over the syllabus carefully and be sure to contact your instructor if you have any questions. The schedule contains due dates, which are also posted on the calendar. The 10-week format makes the schedule fast-paced, giving you the rest of the semester to focus on your other courses, and the skills to write scientific papers required in many of the other courses you will be taking.

# INSTRUCTOR

**Name: Professor Kelli Stickrath**

**Office and Online Hours:** Summer online. Make appointment to zoom.

**Webpage:** https://web.spcollege.edu/instructors/id/stickrath.kelli

**Email:** Stickrath.kelli@spcollege.edu

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# ACADEMIC DEPARTMENT

## Dean

**Name:** Dr. Natavia Middleton

**Office Location:** Seminole LI 280

**Email:** Middleton.Natavia@spcollege.edu

**Phone**: 727-398-8288

# COURSE INFORMATION

## Course Description

This course is designed to provide a rigorous look at the process of biologically relevant scientific inquiry. Students will investigate the formulation of scientific hypotheses, experimental design, collection of data, and dissemination of results. In-depth understanding and use of scientific literature will be developed and applied to both written and verbal communication exercises. This course will include challenges faced by scientists including scientific bias, dissemination to the general public, and incorporation of scientific discoveries into policy. It is recommended that this course be taken during the first semester within the BS Biology program.

## Course Goals (1-4) and Objectives

1. The student will differentiate between scientific and non-scientific practices by

1. distinguishing between observational and hypothesis-driven research.
2. describing application of the scientific method, formulation of hypothesis-driven research, and critical analysis of existing scientific knowledge.
3. identifying the difference between a falsifiable and non-falsifiable hypothesis.
4. defining objective vs. subjective interpretation of empirical data sets.
5. evaluating existence of reproducible results through proper use of controls.
6. recognizing experimental interpretation that considers all data regardless of contradiction of current hypotheses.
7. comparing the development and testing of scientific hypotheses vs scientific theories.
8. evaluating controversial subjects of biological science for existence of pseudo-scientific claims, including but not limited to: intelligent design, alternative medicine and exobiology.
9. determining the limits of the scientific method including differences between reporting facts vs. generating moral guidelines.

2. The student will evaluate historical, social, and philosophical perspectives on scientific discovery by:

1. comparing historical approaches to modern views of scientific discovery, from Aristotle to the sequencing of the human genome and understanding how our definition of the pursuit of truth has changed.
2. examining the factors that shape science and scientific thought and interpretation, including the contribution of societal, technological and personal influences. c. recognizing the role of collaboration and competition in science.

d. analyzing controversial issues, including but not limited to: stem cell research, genetic counseling, gene therapy, climate change, evolution and research on human-subjects research.

3. The student will critique the practice of biological science by:

1. synthesizing primary literature, comparing primary to secondary sources and identifying what constitutes an unacceptable scientific resource.
2. using scientific internet database resources and peer reviewed publications vs. secondary, non-peer reviewed science publications as evidence in written and verbal communication.
3. analyzing data sets generated by the student or instructor for the purpose of mastering the following: 1) use of scientific method for design and execution of experiments, 2) graphical representation, 3) data analysis/ interpretation and 4) discussion of significance of data with particular attention to explaining the difference between correlation and causation.
4. identifying proper controls and placebos in all aspects of scientific research.
5. using statistical analysis and accurate interpretation of statistical significance.
6. practicing methods of communicating scientific studies and theories through verbal presentations, poster presentations and peer reviewed written original papers.

4. The student will explain the challenges faced by scientists regarding experimental design, dissemination of findings to the public and implementation of scientific knowledge into policy by:

1. recognizing experimental bias in scientific research, including those driven by politics, money, religion and personal beliefs.
2. discussing the impact of media in dissemination of scientific research and discovery.
3. examining controversial impacts of scientific discovery including but not limited to: eugenics, genetic engineering (GMOs), cloning and embryonic stem cell technology. d. participating in the process of grant writing, peer review and composition of a scientific paper.
4. explaining the contribution of scientific experts in building governmental policies.
5. describing the types of regulations imposed by the government on scientific exploration and discoveries based on societal ethics, health and welfare.
6. Identifying regulations and ethics involving animal testing and human-subject research and examining the potential costs and benefits of new and promising technologies, including but not limited to: stem cell therapy, regenerative medicine, gene therapy, conservation biology and alternative energy resources.

## Prerequisites

1. Prerequisite: BSC 2011 with a minimum grade of C
2. Prerequisite: BSC 2011L with a minimum grade of C

## Availability of Course Content

The course will be available throughout the term, and you may work ahead, however, some assignments may not be accessible after their due dates.

# REQUIRED TEXTBOOK & OTHER RESOURCE INFORMATION

* **Required Text:** The Immortal Life of Henrietta Lacks, Author: Skloot, R. ISBN Number: 9781400052189
* **Required Text:** Hofmann, AH. 2022. Writing in the Biological Sciences. 4th Edition. Oxford University Press. ISBN 978-0-19-754358-0

*Note: You will be using this Hofmann Writing book as a reference throughout the Biology program. I strongly advise you to purchase rather than rent it and to keep it in your library.*

Additional selected weekly readings will be posted on MyCourses

View the [Textbooks](https://go.spcollege.edu/textbooks/) site.

View the [Learning Resources](https://www.spcollege.edu/current-students/learning-resources) site.

# LEARNER SUPPORT

Answers to questions regarding accommodations may be found at the [Accessibility](https://go.spcollege.edu/Accessibility/)

[Services](https://go.spcollege.edu/Accessibility/) site. If you are in need of accommodations, please contact a campus [Accessibility Services Coordinator.](https://go.spcollege.edu/Contact-AccessibilityServices/) If you need a Sign Language Interpreter, complete the [Interpreter/Captionist Request Form.](https://web.spcollege.edu/survey/664)

View the [Learning Resources](https://www.spcollege.edu/current-students/learning-resources) site.

View the [Learning Center Tutoring Schedules.](http://spcollege.libguides.com/c.php?g=609501&p=4230937)

View the [Student Services](https://go.spcollege.edu/services/) site.

# IMPORTANT DATES

Course Dates:

Drop Date with Refund: May 24, 2024

Withdrawal Date (no refund): July 5, 2024 (represents 60% date)

View the [Financial Aid Dates.](https://go.spcollege.edu/fadates/)

# DISCIPLINE-SPECIFIC INFORMATION

[https://www.spcollege.edu/future-students/degrees-training/science-andmathematics/science/biology-bs-degree](https://www.spcollege.edu/future-students/degrees-training/science-and-mathematics/science/biology-bs-degree)

The professor will assign a grade of "0" to any exam or other course work for admitted or alleged academic dishonesty pending appeal. Penalties may include expulsion from college.

View the college-wide attendance policy included in [How to Be a Successful Student.](https://go.spcollege.edu/Addendum/)

# ATTENDANCE

FIRST TWO-WEEK'S ATTENDANCE: Students who do not login and submit assignments in the first two weeks will automatically be withdrawn from the class.

ACTIVE CLASS PARTICIPATION (AFTER FIRST 2 WEEKS): Students who are not actively participating in class will be reported to administration. Administration will automatically withdraw (WF) students for nonparticipation. Active class participation will be judged based on timely submission of at least 70% of assigned work. A student who has submitted 70% or more of the assigned work (in a timely manner) AND will be considered to be actively participating; A student with less than 70% timely submission of material will be deemed “not actively participating” and assigned a grade of “WF” by Administration.

# GRADING

**Weekly assignments include**: synopses of a reading or viewing assignment (MIN 350 words; always referenced with proper CSE citation format), discussion via online discussion board (requires post and reply per weekly instructions), reflection (writing/activity with MIN 150 words), and other activities as listed on course schedule.

**Point values** for each assignment and totals for each week are provided on the course schedule (at the end of this syllabus). The total number of points = 650. Please note that assignments and weeks vary in their point values.

*This course will be graded on a straight scale as follows and is not negotiable (there is no curve).*

**How to check your Grades and review feedback:**

* [Checking Your Grades](https://mycoursessupport.spcollege.edu/checking-your-grades)
* [Reviewing Dropbox Submissions](https://mycoursessupport.spcollege.edu/reviewing-a-dropbox-submission)
* [Checking Discussion Grades and Feedback](https://mycoursessupport.spcollege.edu/checking-discussion-grades-feedback)
* [Reviewing Quiz Submissions](https://mycoursessupport.spcollege.edu/reviewing-a-quiz)

## Grading Scale

|  |  |  |
| --- | --- | --- |
| **Grade**  | **Percentage**  | **Points**  |
| A  | 90-100%  | 585-650  |
| B  | 80-89%  | 520-584  |
| C  | 70-79%  | 455-519  |
| D  | 60-69%  | 390-454  |
| F  | 0-59%  | <= 389  |

# ASSIGNMENTS

## Assignment Details

1. **Synopses**: You will have an assigned reading or viewing that serves as the reference for your synopsis. The electronic copy must be submitted as a Word document (.doc) into the dropbox. This will also automatically submit the synopsis to Turnitin.com where it will undergo a grammar and overlap check. Please check your grammar and overlap scores and make changes as needed BEFORE the final deadline. You will receive feedback directly in your file each week, which will be reattached to the dropbox for your viewing. The purpose of the synopsis is to provide you with practice in critical thinking regarding the selected topics and controversies presented in class. It is NOT primarily a summary of the assigned readings; instead, it should represent the independent thought and analysis by the student. The focus should be on a

rigorous evaluation of a topic from a scientific viewpoint rather than a personal opinion. **Essays should be a minimum of 350 words, paraphrased and cited. The assigned reading should be cited in the text and at the end of your essay using CSE (Name, year) format.** Supplemental resources are not required, but if used, they should be cited as well. No late assignments are accepted.

1. **Discussions**: Based on readings or viewings, you will post a discussion message on the discussion board and will reply to two of your fellow students. When you see that a student already has two replies, find another student to reply to so that everyone receives feedback. Discussions should be respectful and as unbiased as possible and should remain focused on the weekly topic. Your posts should reflect thoughtful consideration of the topic, not vague statements. You will only see other’s posts after you write a post. No points

will be assigned if you do not participate in the discussion/discussion board prior to the deadline.

1. **Reflection/activity**: At the end of each topic, you will write a reflection on the weekly topic and the class discussion of the topic. **Reflections should be at least 150 words**. You do not need citations here unless specified in the instructions. Writing here can be more informal.
2. **Rewrite of Report**: You will consider all feedback from weekly assignments, your concept map, and your rough draft to rewrite a “model” scientific research paper (a formal version of a lab report). Make sure you do this carefully; it is worth 75 points. After submitting to Turnitin.com, you should carefully look over the report, fix all grammatical errors and plagiarism issues, and then resubmit a final draft.

Your weekly referenced synopses and rewrite of your report will be submitted to Turnitin. CSE-formatted literature citation (Author Year format) is required. You may submit your papers to the Turnitin dropbox in advance of the due date. Turnitin gives you a report on both your originality and grammar. Plagiarized papers OR papers (and discussions) written using Artificial Intelligence will receive a grade of ZERO with NO opportunity to resubmit after the deadline. Plagiarism is also reported to the Academic Honesty Committee at SPC. A first offense typically receives a ZERO; subsequent AH violations may incur harsher penalties, including an “F” in the course and/or suspension or expulsion, depending on the severity of the violation.

PLEASE be careful and check your work.

## BSC 3017 SCHEDULE- SUMMER 2024 (0635)

|  |  |  |
| --- | --- | --- |
| **Week**  | **Topic**  | **Graded Assignment Due Dates**  |
| 1 5/20 | Module 1 – History & Philosophy of Science (55 pts total)  | Quiz- Course syllabus due 5/22 (1 pt)Discussion (5/22) – Introduce Yourself - (5 pts) Discussion (Post by 5/24 Reply by 5/25) – Summarize TED Talk (Snyder ) - (20 pts) Reflection (5/26) – TED Talk (Alon) - (20 pts) Quiz (5/26)- (10 pts)  |
| 2 5/27  | Module 2 – Career Planning and CV (50 pts total)  | Synopsis (5/28) – CV - (20 pts) Discussion (Post by 5/30; Reply by 5/31) – Ad for Dream Job - (10 pts) Dropbox (6/1) – Look for your Dream Job - (10 pts) Reflection (6/2) – The Truth About You - (20 pts)  |
| 3 6/3  | Module 3 – How to Read Scientific Literature & Distinguish Types of Literature Sources (50 pts total)  | Synopsis (6/5) – Evaluation of Scientific Research & Review Paper - (20 pts) Discussion (Post by 6/6; Reply by 6/7) – Find and Evaluate Scientific News Article - (10 pts) Reflection (6/9) – Scientific Discovery - (20 pts)  |
| 4  6/10  | Module 4 – Doing Science, Part 1 – Hypothesis Testing and Data Collection (60 pts total)  | Synopsis (6/12) – Dimensions of the Scientific Method - (20 pts) Discussion (Post by 6/15; Reply by 6/16) – Hypothesis Testing - (20 pts) Submit Data (6/13) – data from Quaardvark - (20 pts)  |
| 5 6/17  | Module 5 – Doing Science, Part 2 – Analyzing and Graphing Data (70 pts total)  | Synopsis-Data Analysis Activity (6/21)– submit graphs and analysis - (40 pts) Discussion (Post by 6/22; Reply by 6/23) – Interpretation of Results - (30 pts)  |
| 6 6/24 | Module 6 – Doing Science, Part 3 – Scientific Writing (95 pts total)  | Synopsis – (6/26) Initial Draft of Research Paper in a Concept Map - (30 pts) Discussion – (Post by 6/27; Reply by 6/28) Peer Review of Concept Map - (30 pts) Rough Draft of Scientific Paper (6/30) - (35 pts)  |
| 77/1  | Module 7 – Pseudoscience & Scientific Literacy (60 pts total)  | Synopsis – (7/3) Science, Pseudoscience & Scientific Literacy - (20 pts) Discussion – (Post by 7/4; Reply by 7/5) Discussion of pseudoscience and scientific literacy - (20 pts) Reflection (7/7) - Pseudoscience and Science Denial - (20 pts) Start reading The Immortal Life of Henrietta Lacks book |
|  8 7/8  | Module 8 – Competition & Collaboration in Science (60 pts total)  | Synopsis (7/10)– Competition & Collaboration - (20 pts) Discussion (Post by 7/11; Reply by 7/12) – Competition & Collaboration - (20 pts) Reflection (7/14) - Peer Review of Research Paper- (20 pts)  |
| 97/15 | Module 9 – Scientific Policy and Ethics (60 pts total) | Synopsis – (7/16) Henrietta Lacks - (20 pts) Discussion (Post by 7/18; Reply by 7/19) – Scientific Ethics and Policy - (20 pts) Reflection (7/21) - Scientific Ethics and Policy - (20 pts) |
| 10 7/22  |  Module 10 – Rewrite Scientific Paper & Press Release(90 pts total) |  Synopsis-scientific Paper (Lab) Rewrite (7/25) - (75 pts) Discussion Post – Press Release of Scientific Paper (7/25) – post only; no reply required - (15 pts) FINAL DAY: DUE 7/26 |

# STUDENTS' EXPECTATIONS AND INSTRUCTOR'S EXPECTATIONS

## Instructor Expectation of Students

* You should treat the opinions of others with respect and tolerance.
* You should complete all assignments on time and with thoughtfulness.
* You should practice academic honesty in all your work. This includes working independently on ALL assignments unless you are told otherwise. All work you submit should be YOUR OWN. Unauthorized collaboration will result in a zero for the assignment, which cannot be dropped as your lowest grade. Plagiarism of ANY type will be given a grade of zero. To avoid plagiarism, ALL REFERENCES must be cited properly using CSE format. The proper format for scientific research papers is covered in links provided in MyCourses. The library can also supply you with proper CSE format. Note that papers written for scientific publication RARELY quote, so it is important to paraphrase works into your own words. Substituting synonyms but following the same basic framework of a published paper is STILL plagiarism. Your goal is to synthesize the works of many other authors into YOUR overview of a particular topic. The KEY here is that this is YOUR synthesis, so it must show your ability to incorporate various works into one cohesive paper and it must be written in your own words. Papers generated using Artificial Intelligence will receive a ZERO. You may submit rough drafts to turnitin.com before you submit the final draft. Turnitin gives you a report on your originality. You should carefully look over the report from turnitin.com and fix all plagiarism issues. Plagiarized papers will receive a grade of ZERO with NO opportunity to re-submit. Microsoft Word has a grammar-check function, which is not perfect, but you should definitely use it and consider the suggestions. Feedback on your papers will be provided using Track Changes in Microsoft Word.
* **Late assignments will not be accepted for a grade**. All assignments are due at midnight on the date indicated on the schedule.
* You should contact me promptly if there is a problem requiring my attention.
* ANY violation of the honor code (www.spcollege.edu/academichonesty/) will result in formal documentation filed with the Academic Honesty Committee at SPC. **Violations may result in suspension or expulsion from the college.**

## What You Can Expect From Me

* Assignments designed to broaden your knowledge of, and improve your ability to communicate your understanding of the theory of science.
* Total availability to address any concerns or issues that may interfere with the learning process.
* Thoughtful and critical responses to your written assignments to further enhance your understanding of the subject.
* Presentation of key elements within the assigned activities to help structure and organize your ability to learn.
* Clear, fair and objective grading policies.

## Participation, Conduct, and Netiquette

SPC has outlined expectations for student behavior and interaction for online discussions, email, and other forms of communication. View the Student Expectations in [How to Be a Successful Student.](https://go.spcollege.edu/Addendum/) **Academic Honesty**

View the [Academic Honesty Policy.](https://go.spcollege.edu/AcademicHonesty/)

## Copyright

Copyrighted material within this course, or posted on this course website, is used in compliance with United States Copyright Law. Under that law you may use the material for educational purposes related to the learning outcomes of this course. You may not further download, copy, alter, or distribute the material unless in accordance with copyright law or with permission of the copyright holder. For more information on copyright visit: [Copyright.gov.](https://www.copyright.gov/)

# TURNITIN

The instructor of this course may require use of Turnitin.com as a tool to promote learning. The tool flags similarity and mechanical issues in written work that merit review. Use of the service enables students and faculty to identify areas that can be strengthened through improved paraphrasing, integration of sources, or proper citation. Submitted papers remain as source documents in the Turnitin database solely for the purpose of detecting originality. Students retain full copyright to their works. Review the [Turnitin Usage Agreement.](https://turnitin.com/agreement.asp) Students who do not wish to submit work through Turnitin must notify their instructor via course email within the first seven days of the course. In lieu of Turnitin use, faculty may require a student to submit copies of sources, preliminary drafts, a research journal, or an annotated bibliography.

View the [Reviewing a TurnItIn/Originality Report](https://mycoursessupport.spcollege.edu/reviewing-a-turnitin-report) tutorial.

# STUDENT SURVEY OF INSTRUCTION

The Student Survey of Instruction is administered in courses each semester. It is designed to improve the quality of instruction at St. Petersburg College. All student responses are confidential and anonymous and will be used solely for the purpose of performance improvement.

# TECHNOLOGY

## Minimum Technology Requirements

View the [Technical Requirements for MyCourses.](https://mycoursessupport.spcollege.edu/technical-requirements-for-mycourses)

SPC offers Microsoft Office software to current students at no additional cost. The software is available for both Windows and Mac computers. View the [How to Download Microsoft Office 2016](https://mycoursessupport.spcollege.edu/download-office-2016) tutorial.

## Minimum Technical Skills

Specify the minimum technical skills expected of the learner: general and coursespecific learners must have to succeed in the course.

Students should know how to navigate the course and use the course tools. Dropbox-style assignments may require attachments in either Microsoft Word (.doc or .docx) or Rich Text Format (.rtf), so that they can be properly evaluated. If an attachment cannot be opened by the instructor, students will be required to reformat and re-submit an assignment so that it can be evaluated and returned with feedback.

MyCourses tutorials are available to students new to this LMS and are located at the beginning of the course. Most features on MyCourses are accessible on mobile devices, although it is recommended that you use a computer for quizzes, tests, and essay assignments.

**Technical Support**

Technical support is available via the [SPC Technical Support Center.](https://support.spcollege.edu/_layouts/15/start.aspx#/SitePages/Home.aspx)

## Accessibility of Technology

* [MyCourses (Brightspace by Desire2Learn) Accessibility](https://www.d2l.com/accessibility/)
* [Turnitin Accessibility](https://www.turnitin.com/about/accessibility)
* [Google (YouTube) Accessibility](https://www.google.com/accessibility/)
* [Ensemble Accessibility](https://help.ensemblevideo.com/hc/en-us/articles/360000211806-Accessibility-Solutions)
* [Cengage Accessibility](https://www.cengage.com/accessibility/)
* [McGraw-Hill Accessibility](https://www.mheducation.com/about/accessibility.html)
* [Pearson Accessibility](https://www.pearson.com/us/accessibility.html)

## Privacy

* [MyCourses (Brightspace by Desire2Learn) Privacy](https://www.d2l.com/legal/privacy/)
* [Turnitin Privacy](https://help.turnitin.com/Privacy_and_Security/Privacy_and_Security.htm?Highlight=privacy+statement)
* [YouTube Privacy](https://support.google.com/youtube/answer/7671399?p=privacy_guidelines&hl=en&visit_id=636916340919958182-33824501&rd=1)
* [Ensemble Privacy](https://ensemblevideo.com/company/privacy-policy.aspx)
* [Cengage Privacy](https://community.cengage.com/pyejh52637/attachments/pyejh52637/CounselingSocialWorkHelpfulResources/4/2/Privacy%20Statement.pdf)
* [McGraw-Hill Privacy](https://www.mheducation.com/privacy.html)
* [Pearson Privacy](https://www.pearson.com/corporate/privacy-notice.html)

## Instructional Continuity Plan

To be prepared in the event of weather or other emergency disruptions, review the [Emergency Preparedness Procedures for Students.](https://mycoursessupport.spcollege.edu/emergency-preparedness-procedures-for-students)