

## Science of Chocolate – BIO50-194 – Spring 2022



### Natural Science General Education with Social Justice Emphasis

Spring 2022

Class - MW 11:00 - 12:15 pm; Mood Bridwell 306

Office Hours: MW 3-5 pm and by appointment (in person or online)

Dr. Romi Burks, Professor of Biology

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Useful website: [www.profromi.com](http://www.profromi.com)

This course explores the biology and chemistry of *Theobroma cacao*, the plant from which people make chocolate. Topics in the course will include pollination ecology, genetics, antioxidants and health and climate change. In addition, production versus consumption of chocolate will be discussed in light of economics and social justice issues including child slavery, indigenous communities and agricultural goods. Class activities will include a combination of inquiry-based projects, class discussion and quantitative reasoning. (SJ) (NS).

#### SCIENCE OF CHOCOLATE STUDENT LEARNING OUTCOMES:

##### Students will be able to:

1. **Describe** chocolate-making process from "pod/bean to bar" and identify specific flavors or tones from chocolate bars.
2. **Differentiate** between confectioners, chocolatiers and chocolate makers.
3. **Gain** skills in the scientific way of thinking.
4. **Understand** the basics of setting up a quality experiment.
5. **Connect** science to social justice.
6. **Explain** inherent difficulty involved in defining the term "species" and how that relates to the varieties of *Theobroma cacao*.
7. **Discuss** what "socially responsible chocolate" means and give examples.
8. **Improve** their skills in translating science for public consumption.
9. **Support** a health claim with quality sources.
10. **Communicate** the biology, chemistry, physics, neuroscience and health aspects of chocolate.

**SOME OF WHAT CHOCOLATE CLASS CAN FOSTER:**

- Reduction in the fear of science by using the familiar to teach core concepts
- Reflective nature of informed personal choice
- Recognition and creation of interdisciplinary connections
- Questioning of prior assumptions
- Awareness of commodity fetishism (consumer awareness)
- Recognition of social justice issues
- Critical analysis skills in texts and media
- Understanding of impact of global market, food politics and corporate social responsibility
- Insight into historical and current slavery practices
- Community in the classroom
- Comparison between scholarly versus non-scholarly sources
- Creativity and out-of-the-box thinking

**"Social Justice" general education requirement:**

This course satisfies the Social Justice general education requirement. The course encourages you to understand the relationship between difference and inequality (i.e. how social differences are constructed), and how human differences have been used to justify structures of power and injustice (and how they get tied to inequality), and how people have engaged in activism to promote social justice (i.e. mobilized against those systems).

**Texts:**

1. Ramsey, Chocolate - 9781465454065
2. Craft Chocolate TV
3. Supplemental materials as found on Moodle

**CHOCOLATE PIECES (300 points):****1. Participation (5%) 15 points**

Individual\* Points. Self and peer evaluated includes, but is not limited to:

Timely arrival and attendance  
 Engaged presence – camera online  
 Group work  
 Communication and work ethic  
 Willingness to engage

**2. Biweekly Tasting Log and Reflections (15%) 6 x 7.5 points = 45 points**

The first 10-15 minutes of most classes will focus on tasting. Daily class entries that show engagement in the tasting through notes on the tasting templates. You should make a copy of the Template and then share it with Dr. Burks. Biweekly reflections (minimum 300 words) focus on how the student's palette has changed (not just a summary).

- **0** - 1+ point Little effort; only brief info on bars; no reflection
- **2.5** - 4+ points Modest effort; gives 1-2 bits of info only; no reflection
- **5** - 6+ points Satisfactory effort; includes all bar info, tasting notes; ok reflection
- **7+** points Expected quality effort; includes bar info, tasting notes; solid reflection

### **Bi-weekly reflections for tastings will be due on the preceding Sunday by noon.**

- Tasting Reflection 1: Due Monday, 1/31
- Tasting Reflection 2: Due Monday, 2/14
- Tasting Reflection 3: Due Monday, 2/28
- Tasting Reflection 4: Due Monday 3/28
- Tasting Reflection 5: Due Monday, 4/11
- Tasting Reflection 6: Due Monday, 4/25

### **3. Health Truth/Myth Infographic and Annotated Bibliography (Pairs) - (10%) 30 points**

Pairs of students will select a "Health Claim" and identify the extent to which it "holds water." Health claims need pre-approval by Dr. Burks and will occur on a first-come, first-serve basis. The project outcome will be an "infographic"

Draft infographics will undergo peer review.

A separate annotated bibliography (citation; summary; take away usage) of five sources (APA Format) will accompany each infographic.

For some resources on infographics, check out:

<https://venngage.com/blog/good-infographic/> and watch this video at:  
[https://youtu.be/uQXf\\_d5Mgig](https://youtu.be/uQXf_d5Mgig).

The final infographic will be due **Wednesday, March 30th, 2022.**

Students can receive 5 pts. Extra credit if they choose to present their infographic at the Creative Works Symposium on Tuesday, April 12th.

### **4. Chocolate Research Poster (15%) 45 points - Group - due Finals Time**

Students will work together to design and execute a small experiment about chocolate. Points will be divided up into three worksheets (5 points each): 1) developing a question; 2) experimental design; and 3) data analysis. Dr. Burks will assist each group with statistical analysis of the data collected. The end product will be a scientific poster with a short contextual introduction, a methods section, results and data analysis and conclusions.

### **5. Science-based Press Releases (20%) 2 x 30 points = 60 points - Individual Points.**

See separate rubric for details. Students will select a recent (2012-current), peer-reviewed primary literature scientific paper to translate into approximately 500 words and present to the class in no more than 3 Google Slides. Students should choose papers from two different scientific areas. Deadlines for these assignments will be flexible. Students should complete the **first one by Wednesday, March 2nd and the second by Wednesday, April 6th. All papers require prior approval.**

### **6. Biweekly Google "Chocolate Block" Quizzes (30%): 6 x 15 points = 90 points - Individual or Paired.** These quizzes will be done on Google Drive and will be posted on the Friday of

the week preceding their due date. Students must write out the Honor Code in answer to the final question for the quiz to count. If students choose to take it as a pair, then students will receive the same grade. The quizzes will include a combination of multiple choice, matching/vocabulary and a couple of short answer questions.

- Chocolate Block Quiz 1: Due Monday, 1/24
- Chocolate Block Quiz 2: Due Monday, 2/7
- Chocolate Block Quiz 3: Due Monday, 2/21
- Chocolate Block Quiz 4: Due Friday, 3/11
- Chocolate Block Quiz 5: Due Monday, 4/4
- Chocolate Block Quiz 6: Due Monday, 4/18

### 7. Social Justice Final Essay Question (10%) = 30 points - Solo

On the day of the final exam, you will respond to an essay question focused on the connections between science and social justice.

	Number	Points per Submission	Total Points	% of Grade	Due	Compositi on
Participation	1	15	15	5	Every day	Solo
Tasting Log and Reflection	6	7.5	45	15	Bi-W	Solo
Health Truth/Myth Infographic & AB	1	15	15	5	3/30	Pair
Chocolate Research Poster	1	45	45	15	Finals	Pair or Group
PL Press Releases	2	30	60	20	3/2 & 4/6	Solo
Quizzes	6	15	90	30	Bi-W	Solo - Pair
Final Essay Social Justice	1	30	30	10	Finals	Solo
7 Areas	18 Things	13 Small 5 Big	300	100	Solo (50-80) Pair/Group (20-50)	

**Letter Conversions:**

A+ = 97.5% - 100% = 292.5- 300

A = 92.5% and up = 277.5+

A- = 89.5% and up = 268.5+

C+ = 77.5% and up = 232.5+

C = 72.5% and up = 217.5+

C- = 69.5% and up = 347.5 – 208.5+

B+ = 87.5% and up = 262.5+

B = 82.5% and up = 247.5+

B- = 79.5% and up = 238.5+

D+ = 67.5% and up = 202.5+

D = 62.5% and up = 187.5+

D- = 60% and up = 180+

F = below 180

**Additional Class Information:**

**WORK OUTSIDE OF CLASS:** I anticipate that students will spend approximately 2 hours out of class for every hour in class. The majority of this time will be spent working on press releases, reflections and completing chocolate block quizzes. I would designate 30-45 minutes for reading material associated with class each day.

**MOODLE:** Southwestern uses an interactive course management system called Moodle. We will use Moodle to share materials and in some cases, submit assignments. You should automatically be loaded into the system and can access Moodle via the SU Portal or directly at [lms.southwestern.edu](http://lms.southwestern.edu). Your username and password is your regular SU electronic ID (same as your email). With any technological application, sometimes things can go awry. Melanie Hoag ([hoagm@southwestern.edu](mailto:hoagm@southwestern.edu) x1644) can be of assistance with any Moodle difficulties.

**MOODLE SYLLABUS STATEMENT:** After reading the syllabus, please mark important dates on calendars (quizzes/exams, drop dates, group presentations) and COMPLETE THE SYLLABUS CHECK by typing in "I have read the syllabus and understand the expectations." By entering this, I know that you understand:

1. The expectations for success in Conservation Biology are abundantly clear.
2. Students can make an appointment with Dr. Burks if times conflict.
3. All your questions about the syllabus have been answered.
4. Students will first consult the syllabus and then clarify with Dr. Burks.

**ATTENDANCE RELIGIOUS AND CULTURAL TRADITIONS:** Southwestern University recognizes that it has students from a variety of religious and cultural traditions that have special days of observance or celebration that may take students out of their regular activities on certain days during the school year.

1. *As far in advance as possible, the student is expected to notify the professor(s) or instructor(s) of the class(es) to be missed.*
2. *The student is expected to learn what assignments or exams are due or will be assigned on those dates and negotiate with the professor(s) or instructor(s) alternate times for fulfilling those requirements.*
3. *Students should be prepared to fulfill the requirements prior to the class(es) to be missed.*

**OPEN COMMUNICATION:** Please discuss questions and areas of concern with Dr. Burks.

**LATE PAPERS:** Given the pandemic world, I'm okay with fluidity of deadlines that do not affect others. If you feel that you need more time to produce quality work, then extensions or revised deadlines can be implemented but I encourage you to meet deadlines so that work does not pile up. To avoid penalty, you must request extensions before the work comes due. Late work submitted without notice will receive a reduction of 20%.

**HONOR CODE:** All work in this course needs to adhere to the Honor Code, which the Student Handbook describes in detail. Please pay special attention to the discussion of plagiarism. I encourage group work and discussion among you all, but do independent work on your own (feel free to discuss the topic with classmates, etc., but when you sit down to write, you should do that on your own). You will also need to be careful with how you use your research sources—summarizing and/or paraphrasing an author's ideas requires citation. The Honor Pledge, which you will write on exams, quizzes, essays and other work you submit for grades for all of your coursework at Southwestern (unless otherwise indicated by your professor) is: **"I have acted with honesty and integrity in producing this work and am unaware of anyone who has not." For electronic assignments, students can put it in the header and initial.** I consider myself a "hard-core" Honor Code Supporter. All course work is to be done independently unless otherwise noted. You should type in the Honor Code on electronic assignments or fill out the questions on quiz items.

**Please write out and sign the honor pledge IN FULL.** If you are unclear on the concept of plagiarism or cannot sign the honor code in good faith, please see Dr. Burks immediately. When in doubt, paraphrase and cite using Name and Year methods (Burks 2003). Any perceived impropriety will be discussed with the student and appropriate action pursued. I generally recommend course failure for any intentional, blatant deception.

**ACCESSIBILITY, STUDENT SUCCESS & ACCOMMODATIONS:** All of us learn in slightly different ways and I try to design my courses so that that multiple means of accessing class information, multiple ways to take part in class activities, and multiple avenues for being assessed on class work all exist. If circumstances occur that may affect your performance in this class, please let me know as soon as possible so that we can work together to develop strategies for adapting assignments to meet both your needs and the requirements of the course. If you have documented disabilities, please see paragraph below.

Southwestern University maintains a policy to make reasonable accommodations for students with documented disabilities. To arrange accommodations students should contact the Assistant Director of Academic Success within the Center for Academic Success and Records (CASAR in the Prothro Center room 120; phone 863-1286). Students seeking accommodations should notify the Assistant Director of Academic Success at least two weeks before needed. It is the student's responsibility to discuss any necessary accommodations with the appropriate faculty member. In addition, I urge any student who has any life difficulties (it

happens, especially during pandemic times) and believes this may affect their performance to contact me and/or any director in the division of Student Life for support.

**CLASSROOM COMMUNITY:** Treat all class members with professionalism and respect. Be fully present in class (i.e.):

- Turn off and put away all cell phones, beepers, and laptops when you enter the classroom. Volumes of research shows that student academic success is greater when they do NOT use laptops, etc. in classes, but use paper and pen/pencil instead to take notes. If disability accommodations include your use of a laptop, please obtain the required approval forms and let me know.
- **Bring printed out copies of readings/notes or your writing when I specify you should do so.**
- Listen and participate when your peers lead discussions.
- Leave your other work outside our classroom. Do not aim to complete assignments for other classes. Engage in class discussion and activities.

**WRITING CENTER:** An invaluable resource is the **Writing Center**; Writing Center staff are available to assist you in conceptualizing papers, in helping you create an outline, in reviewing drafts of your papers for the logic and coherence of your argument, the effectiveness of your evidence, etc... The Writing Center requires students to sign into an on-line system. You can do so here: [mywco.com/dewc](http://mywco.com/dewc). Check out the website, which includes online writing resources, including some new additions!

**WRITING EXPECTATIONS:** Write all formal submitted assignments **in active voice**. For all work, take into consideration advice from the Biology Department's Writing Guide:

<http://www.southwestern.edu/live/files/4637-biology-department-writing-guide>

For citations, apply APA format.

**EMAIL:** I will frequently e-mail to remind you of deadlines or to clarify points from a lecture. Please check daily.

**SUBMITTING ASSIGNMENTS/FILES:** Moodle/Google Drive. I cannot open ".pages" documents on Moodle. Please make sure to always make your documents open-able by MS Word or Adobe PDF on a PC platform. Save them with .doc or .docx extensions, ideally. I may ask you to submit/share some assignments as Google Docs so that I can easily comment on them.

**Please properly name your work: LastNameAssignmentDate.doc**

**Example: BurksWeek1Questions083021.doc**

**FACEBOOK/SOCIAL MEDIA POLICY:** All official class information goes through Moodle or myself to your SU email. If someone wants to take the initiative to make a group, I am in favor of group studying and brainstorming. I'm happy to be "A Friend" with SU students with the knowledge that I am a faculty member at Southwestern first and take that seriously. If I see something that worries me, I will follow up. I believe in better safe than sorry. At the same time, I'm certainly not in the habit of checking up on students but cannot help but read updates when posted. My Profile page is all-inclusive for my friends, family and some students. I do not post anything there that I am not willing to publicly share (this is good advice). So, if you would like to request to be my friend, I will certainly accept but I do not want to compel people. As another social media alternative, you can follow me on Twitter @ProfRomi. I originally started a Twitter account to keep up with the chocolate world and have found it a good source of news (I can recommend some to follow to get started).

**GROUP WORK:** All students are expected to contribute equally to group or pair projects.

**NO OTHER FOOD:** Please avoid eating anything but chocolate during class. You should have water available as a palate cleanser.

**CRITICAL READING GUIDELINES:** Even if you think "science" isn't your thing, it will be difficult for chocolate class not to be fun. However, whether you will enjoy and learn a great deal from this class is almost entirely up to you and your commitment to reading the course materials and engaging in classroom discussion. Thoughtful reading is both active and responsive. As a general rule, thoughtful engagement either: (a) uses readings and/or videos as the basis for formulating interesting discussion questions; (b) uses readings and/or videos as a basis to develop an interesting positive argument of your own; and/or (c) treats an author/work as an opponent worth refuting.

**TASTING EXPECTATIONS:** Students should be willing to try all of the chocolate whether or not it suits their tastes. It's perfectly fine to spit out chocolate that students find unpalatable but students should try to keep chocolate on their palate for 30 seconds. Each tasting only requires a small amount of chocolate (i.e. about the size of a peanut/pea). The tastings provided in your materials should allow for at least two possibilities for tasting.

### **COVID ADDENDUM:**

**MASKING:** The University continues its indoor mask mandate. Should the University policy change, Southwestern faculty have been granted permission to establish masking policies for their courses at their discretion. **In this course, masking will be required until further notice.** All students and any visitors - regardless of vaccination status - are required to wear a properly worn face mask (over the nose, over the mouth, and under the chin) at all times. Should you forget your face mask, the building administrative assistant can provide you with one. Thank you for your compliance.

### **IN PERSON ETIQUETTE AND PARTICIPATION WHILE MASKED:**

- Be a good citizen and follow the rules.
- If unvaccinated, always maintain social distance.

- Clean your desk area before class.
- If vaccinated, mask as advised and maintain 3 ft. social distance.
- Keep the desk arrangements as you find them.
- **Practice talking while masked. Note the volume required.**
- Do not hesitate to ask someone to repeat themselves (me included).
- Be patient.

**SELF-CARE:** College life is great, but also stressful and demanding, especially now.. College life under the umbrella of covid is a new frontier. Keep in mind that **nothing is as important as you and your support system.** Take care of yourself 1<sup>st</sup> and then help others.

**Here is a list of SU Resources:**

[https://drive.google.com/file/d/1Hf2GwDPYLNu\\_gpvl9lkrHYVExxPpYjM-/view](https://drive.google.com/file/d/1Hf2GwDPYLNu_gpvl9lkrHYVExxPpYjM-/view)

**ATTENDANCE:** A lot of effort has been made to conduct in-person classes at Southwestern. In general, I encourage you to attend class **BUT ONLY ATTEND IF AND ONLY IF YOU FEEL GOOD. WHEN IN DOUBT, STAY HOME.**

- **Attendance itself is not directly part of your grade.** Your engagement and participation will largely be assessed through projects and presentations.
- If you think you may have had close contact with an infected person, begin quarantine in your own room immediately and call the COVID-19 Care Coordinator at 512-863-1605.
- If you develop any symptoms of COVID-19 (esp. fever, cough), call the SU Health Center at 512-863-1252 to schedule an appointment.
- If you need assistance in getting medical care, contact your Resident Assistant or SUPD at 512-863-1944.
- Do your best to communicate with me.
- Designate a peer to communicate updates if that is easier.
- Do not worry about missing class if necessary. I promise to work individually with everyone on a case-by-case basis.

#### Some Self-Care Basics

- Prioritize but don't skimp on the basics (eat, sleep, move)
- Stick to a routine and check in with friends and other supporters
- Stay connected but limit news consumption
- Be mindful of substance use
- Practice mindfulness and other relaxation techniques
- Cut yourself some slack and watch for signs of trouble in yourself (Reference: <https://www.apa.org/monitor/2020/07/self-care>)



**Tentative Schedule - subject to change as needed - Follow Class Prep per Moodle**

Date	Day	Topic	Chocolate	Activity	What's Due
<b>Week 1</b>					
1/10	M	What's chocolate really?	Little Bit of Everything		
1/12	W	Scientific Process			
<b>Week 2</b>					
1/17	M	MLK - No Class			
1/19	W	Process of Making/Tasting			
<b>Week 3</b>					
1/24	M	Microevolution (inheritance)		Just So	Quiz 1
1/26	W	Macroevolution (species)		CB Lab	
<b>Week 4</b>					
1/31	M	Genetics 1			Tasting 1
2/2	W	Genetics 2			
<b>Week 5</b>					
2/7	M	Setting the Bar Film		Film	Quiz 2
2/9	W	Chemical Composition		Melt	
<b>Week 6 - Watch <i>Chocolat</i> before Brown Symposium</b>					
2/14	M	Brain on Chocolate - Neuro			Tasting 2
2/16	W	Brown Symposium			

Date	Day	Topic	Preparation		What's Due
<b>Week 7</b>					
2/21	M	Paper Dissection			Quiz 3
2/23	W	SU Unity Day - No Class			
<b>Week 8</b>					
2/28	M	Antioxidants Chemistry			Tasting 3
3/2	W	Latest Science + Slides			Press Release 1
<b>Week 9</b>					
3/7	M	Chemistry of Bean to Bar			ID Research ?
3/9	W	Statistics & Design			Quiz 4 on 3/11
<b>Spring Break (3/14 - 3/18) Precedes Week 10</b>					
3/21	M	Film: Dark Side Choc	Watch Shady		RB at TLU
3/23	W	Physics of Bean to Bar			Exp. Design
<b>Week 11</b>					
3/28	M	Terroir and Soils			Tasting 4
3/30	W	Presentations + Buffer			Infographic
<b>Week 12</b>					
4/4	M	Agroforestry Climate Change			Quiz 5
4/6	W	Group Time + Presentations			Press Release 2
<b>Week 13</b>					
4/11	M	Group Time - Experiment			Tasting 5
4/13	W	Group Time/Statistics			Data Worksheet

Date	Day	Topic	Preparation		What's Due
<b>Week 14</b>					
4/18	M	Art, Science & Chocolate	School of Chocolate	Netflix	Quiz 6
4/20	W	Art, Science & Chocolate	School of Chocolate		
<b>Week 15</b>					
4/25	M	Group Work - Poster			Tasting 6
4/27	W	Science & Social Justice		Evals	Participation
<b>Finals Week</b>					
5/6	F	8:30 - 11:30 am			Research Poster
					SJ Final Essay