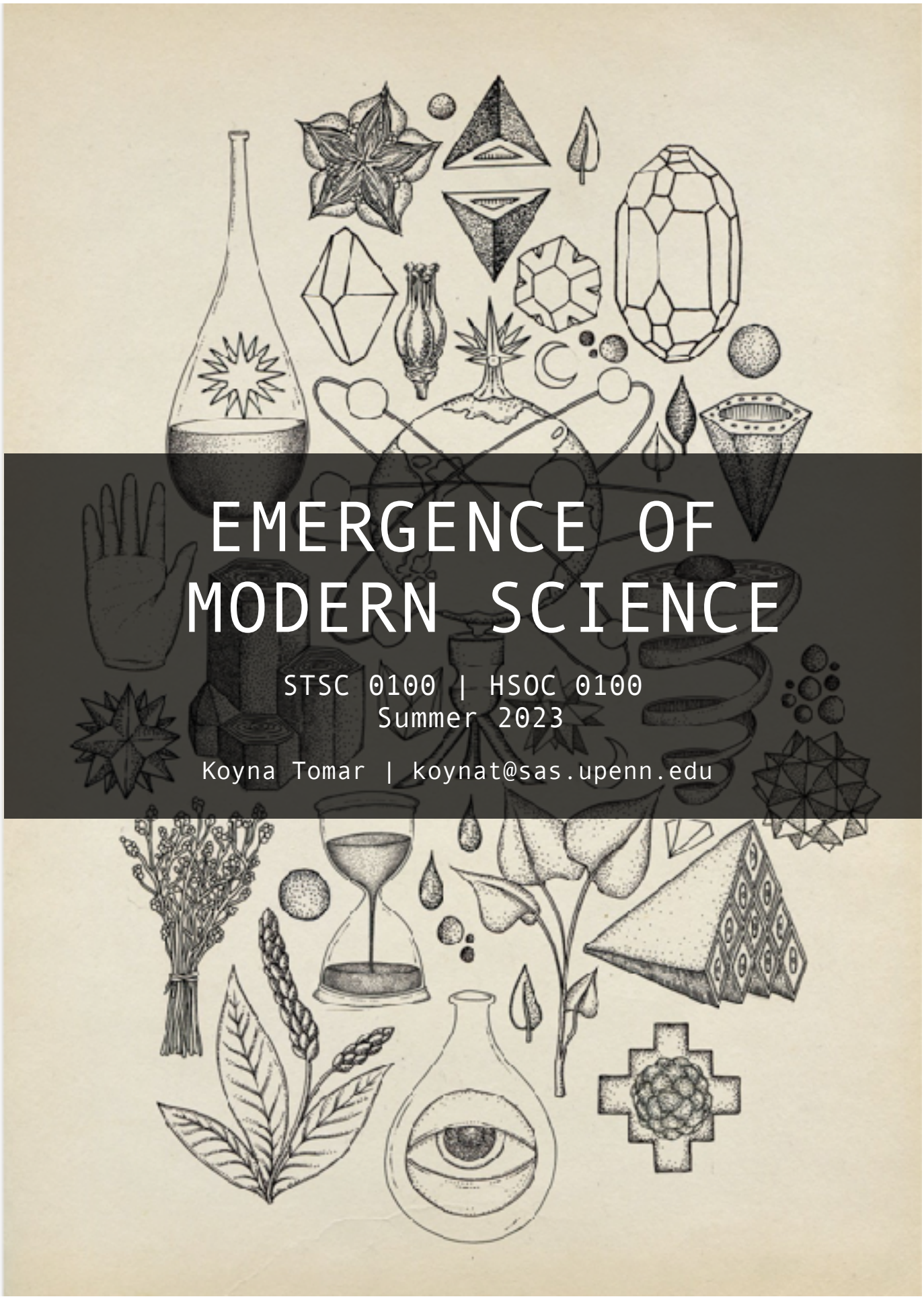

EMERGENCE OF MODERN SCIENCE

STSC 0100 | HSOC 0100
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Koyna Tomar | koynat@sas.upenn.edu

EMERGENCE OF MODERN SCIENCE

From the ongoing climate crisis to public health in the Covid-19 pandemic, from personal and collective questions about heredity and belonging to metaphysical questions about life and death, we turn to science for authoritative answers on many contemporary issues. But how did science come to have such a central and transformative force in our everyday life? Which actors, institutions and practices have shaped the history of science? How have different historical actors defined science? And does science exist in the "singular" or should we speak of "sciences" or, better still, of "knowledges"?

This course gives you the conceptual and empirical tools to query such questions. We will survey the emergence of scientific world views from the antiquity to the present. Moving chronologically and thematically, we will situate the history of science as a history of different "ways of knowing". Each week we will place ourselves in a specific historical setting and learn to ask socially informed questions about the practice of science in that period. How do historical, social, cultural, religious, aesthetic and political forces shape the questions that scientists ask? What is the relationship between scientific research and the making of gender/sex/race differences? What counts as science and what is left out? Focusing on these questions this course will introduce concepts and case studies that help us historicize and also reimagine our relationship with scientific knowledge and expertise. Reading across different time periods and geographies, students will cultivate skills in critical thinking as we analyze, refigure, and speculate scientific present, pasts, and futures.

COURSE OBJECTIVES

- To introduce key concepts and methodologies in the historical studies of science
- Develop reading abilities across different genres and disciplines in the humanities
- Engage in-depth in one particular area to develop skills in designing and conducting research projects
- Develop the ability to communicate in a variety of formats
- Learn to work and discuss individually and collaboratively

COURSE FORMAT

Each session will be 150 minutes. We will divide our class time between lecture and guided discussion. There will be assigned readings for each session and this will form the basis for our discussion. In addition, we will also read, watch, and listen to material in class.

ASSIGNMENTS

The assessment for this course in split into two components. Half of your grade is based on participation in the course assessed through weekly annotations on readings in Perusal (via Canvas) and weekly reflection papers. The second half is a course-long project. See below for details.

Participation (50%)

Weekly Annotations	20%
Weekly Reflections	30%

Implosion Project (50%)

Implosion Project Idea Submission (due TBD)	-
Implosion Project Submission I (due TBD)	20%
Implosion Project Submission Final (due August 6)	30%

**All submissions are due at midnight **

Weekly Annotations
Before we meet for each session, you will annotate course material on canvas with brief comments/questions. You are also encouraged to respond to your classmate's comments and questions. Think of this as a chat space between you and the rest of the class. These are graded as complete / incomplete on a scale from 0 to 1. You need to complete annotations on 15 readings to reach full credit.

Weekly Reflections
At the end of each week (midnight on Friday) you will submit a 1–2-page reflection on one/few of the themes discussed that week. This should not be a summary. You should use this space to reflect on points/arguments that stood out to you and problems that you found compelling. Your reflection does not need to have elaborate citations or be structured like an essay. However, you must refer to course material, lectures, and our in-class activities/discussions. Some weeks I might give you prompts/questions in advance.

Final Assignment: Implosion Project

The second half of your grade is a course-long project that asks you to analyze the history of a scientific, technological, or medical thing/fact/artifact. **More instructions will be given in the first session,** and we will do weekly check-ins to make sure you are building towards your final submissions. Since the course is only five weeks long, it is important that you work on the implosion assignment throughout the course.

Steps towards your "implosion project":

a) Choose a thing, a fact, an artifact, a process that makes a claim/is related to science & nature, gender, sex, race, body or is thematically relevant to our class in some way. Be as specific as possible. For example, if I were to choose a birth control pill, I would select a *particular* one from a specific brand like Apri sold/available to me at a particular place. If you choose a "fact" or a statistic or a story or a book, be *specific* about where it appears.

To search for your "thing" you could: think about a specific area of scientific research (like primatology, evolutionary and biological sciences, psychology, genomics, epigenetics, intelligence testing, biometric testing, reproductive health, physics etc), search scientific publications like Nature or Scientific American, or browse recent newspapers. You could also notice/attend to your own surroundings and pick an idea/a technology/a material you use/come across in your daily life.

****Submit your implosion project idea via canvas by TBD****

b) Once you have your thing/artifact/fact/process write down all the common knowledge that you have (without additional research or google searches) about the "thing". To do this, to "implode" this object, you have to answer as many questions as you can on *Dumit, Writing the Implosion*, p. 351 – 354 (see on canvas). Make a bullet list of your answers with a note on gaps in your own knowledge.

c) You have now gathered your current knowledge about this "thing". Next, you will begin to use resources, simple google searches, professional journals, newspaper articles etc to gather answers to the same questions. Keep a track of *who* and from *where* you are finding these answers. These become the domains of expertise on your"thing".

****Your notes on step b & c due on TBD****

d) What kinds of knowledge make up your expertise? Are these forms of knowledge on your "thing" that are marginalized or missing from your list? Are there people/communities who are better placed to answer the same questions?

e) Using a cluster of questions that you have answered, and the knowledge you have gathered, you will submit a final project. This can be a 2500-word essay mobilizing our class readings towards analyzing your "thing" or a multimedia project that uses your gathered material as sources to make an argument related to our class (formats can be podcast, a video, a material exhibit, a craft project and so forth). Your final submission should draw upon at least 3 readings and 3 lectures from the course.

**** Final submission due on August 6****

GRADING STANDARDS

A = outstanding, nearly flawless work; assignment(s) completed thoroughly; technically excellent; evidence of creativity and/or inspiration, deep contextual grasp of issues and connections among issues; and ability to synthesize individual elements into broader analysis. [A: 93% and above; A-: 90-92.9%]

B = good work; all aspects of assignment(s) completed thoroughly and competently; technically competent (though perhaps not perfect) in spelling, grammar, format, citations; presentation adequate; does not consistently show inspiration, creativity, deeper grasp of connections, interpretations, and/or synthesis among elements. [B+: 87-89.9; B: 84-86.9; B-: 80-83.9]

C = less than fully satisfactory work; assignment(s) not completed thoroughly or according to instructions; basic grasp of issues not always evident; more than occasional technical flaws. [C+: 77-79.9; C: 74-76.9; C-: 70-73.9]

D = basic work of course (or assignment) not done; little effort evident. [D+: 67-69.9; D: 64-66.9; D-: 60-63.9]

F = incomplete or unsatisfactory work on major assignments or over the course of the se-

mester [<60]

READING

Read before you come to class. Each week will have 80-100 pages of reading overall. Readings will provide a shared foundation for discussion, so make sure you take some time to read before class. Some weeks will have additional recommended readings that provide additional context or theorization related to the themes for the day, but there's no expectation that you will read these during the term. If you have any concern or questions about the readings, do bring them to my student hours.

As you do the readings/ watch lectures – **take notes**. When we read/watch things we often think we will magically *REMEMBER* the content and what we are *feeling/thinking* about the material. Don't be deceived by this optimism, and write things down! It doesn't matter what you're thinking – Is there a fact/place/event you didn't understand or want to learn more about? Do you have questions about the content? Make a note to ask in class/do further research later. Do you have a hunch about possible connections to OTHER ideas/themes? Write them down!

Process of writing is how we learn to make connections, formulate questions about readings, sources, and lectures. Keeping notes will make crafting your assignments MUCH EASIER and will also help you prepare for class discussions.

Some questions to consider while reading (from Dr. Lan Li):

1. What are the conditions of production of this text? (historical, geographical, biographical?)
2. What are the author's central arguments or main points?
3. What evidence does the author use to support their argument?
4. What ideas or authors are being argued against?
5. What assumptions does the author rely on to make their argument?
6. Do you find author's argument convincing? Why or why not?
7. What surprised you about the reading?
8. Are their experiences in your life that resonate with the reading?

INTEGRITY

Please refer to the Penn Code of Academic Integrity. We will take any evidence of cheating, plagiarism, or other forms of academic dishonesty very seriously; possible consequences include failure of the course and disciplinary action.

We will strive to ensure that the course is a space of mutual respect, free of any form of bullying, abuse, harassment, or discrimination based on race, class, religion, age, language, national origin, or sexual identity or orientation, or other personal characteristics. If you believe that these expectations are being violated, please inform one of the instructional staff or the appropriate advising and reporting offices at Penn.

SYLLABUS POLICY

The syllabus and our schedule is tentative and is subject to change with advanced notice. Please see below for a full list of readings and sources.

SCHEDULE AND READINGS

Week 1 : Beginnings

1. Orientations

keywords: modernity, science

- Read Syllabus
- Short pieces on Canvas

Week 2: Historiography

2. Historicizing

keywords: scientist, epistemology, historiography

- Chanda Prescod-Weinstein, *The Disordered Cosmos: A Journey into Dark Matter, Space-time & Dreams Deferred* (2021), Chapters: Who is a Scientist? What is the point of science
- Lorraine Daston, History of Science, 2015

3. Calculating
keywords: expertise, astronomy/astrology

- David Brown, "The Scientific Revolution of 700 BC"
- Stop Calling the Babylonians Scientists https://www.theatlantic.com/science/archive/2016/02/babylonians-scientists/462150/

Week 3: Enlightenment and the Colonial Encounter

5. Observing

keywords: : visual epistemology, observation and experiment, empires

- Daniela Bleichmar, Visible Empire, Selections

6.1 Collecting

keywords: indigenous knowledge, go-betweens

- Susan Scott, Parrish (2007), "Diasporic African Sources of Enlightenment Knowledge"

6.2 Mapping
keywords: cartography, immutable mobiles

- Neil Safier, “An Enlightened Amazon, with Fables and a Fold-Out Map”

Week 4:Experiments: Artisans and Assistants

7. Crafting

keywords: artisanal epistemology, tacit knowledge

- Pamela Smith, TBD
- Harry Collins, “Tacit and Explicit Knowledge”
- Eyferth, “Craft Knowledge at the interface of Written and Oral Cultures”

8.Experimenting

keywords: social relations, habitus

- Steve Shapin, The House of Experiment

Week 5 : Laboring Knowledge

9. Gathering

- Listen to Gabriela Soto Laveaga talk on her book *Jungle Laboratories*

  Episode nine on https://www.bbqplus.org/ventricles-podcast
- Robyn D’Avignon “Primitive Techniques: From ‘Customary’ to ‘Artisanal’ Mining in French West Africa” (2018)

10. TBD

Week 6:Science and Relations

11.1 Gendering

keywords: gender, feminist STS

- Sarah S. Richardson, “Seeing the X: How the X Became the “Female Chromosome.”
- Donna D. Haraway. “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective.” *Feminist Studies* 14(3) (Autumn 1988): 575-599.

11.2 Belonging

keywords: bio-citizenship, genetics

- Banu Subramaniam, “Biocitizenship in Neoliberal Times: On the Making of the “Indian” Genome.”

12. Science Fiction and Futures | Friday, August 5

- In-class short presentations on final Implosion Projects
- Watch : Pumzi

F I N