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| **Date** | **Module** | **Class** | **Learning Goals** | **Assignments** | **Comments** |
| **January** |  |  |  |  |  |
| 3 | 1 | 1 | Origins and earth systems   * Introduction to course * Review expectations * Writing practice: *What is life?* | Reading: Achenbach J. 2012. Washington Post |  |
| 5 |  |  | File structures and introduction to computational tools |  | Data Science Friday |
| 8 | 1 | 2 | Origins and earth systems   * Organize the characteristics of life with respect to spatial and temporal scales * Introduction to the concept of hierarchical control (emergent properties) * Show Powers of Ten | Handout: Relationship of time and size (supergraphic\_01)  Prompt: “*At what scale does life exist?”* |  |
| 10 | 1 | 3 | Origins and earth systems   * Continue concepts from last session * Brainstorm the order of emergence in biological systems * Discuss reading from Class 1 in relation to the “Land Ethic” | Reading: Leopold A. 1949. The Land Ethic  Reading: Whitman WB *et al*. 1998. PNAS  Reading: Definition prokaryote |  |
| 12 |  |  | Introduction to Git and GitHub via the command line | Tutorial: Git Intro full | Data Science Friday |
| 15 | 1 | 4 | Origins and earth systems   * Introduction to evidence worksheets * Initiate evidence worksheet\_01 | Evidence worksheet 01: Whitman WB *et al*.1998. PNAS |  |
| 17 | 1 | 5 | Origins and earth systems   * Instructor presentation on the origin of life and evolution of earth systems * Complete evidence worksheet\_01 | Problem set\_01 | Sean Presents |
| 19 |  |  | Introduction to RStudio and Rmarkdown | Tutorial: Rmd Intro | Data Science Friday |
| 22 | 1 | 6 | Origins and earth systems   * Introduction to problem sets * Initiate problem set\_01 * Describe module learning goals and key concepts from an “eons” perspective |  | Intro to R workshop begins;  Sean in Indonesia |
| 24 | 1 | 7 | Origins and earth systems   * Complete problem set\_01 * Discuss problem set\_01 * Initiate evidence worksheet\_02 based on “eons” discussion in grab bag groups | Reading: Nisbet EG and Sleep NH. 2003. Nature.  Reading: USGS. 2007.  Reading/Evidence worksheet 02: Kasting FJ and Siefert JL. 2003. Science  Prompt: “*Describe key events in the evolution of Earth systems”* | Sean in Indonesia |
| 26 |  |  | Working with data in R: the tidyverse | Tutorial: Working with Data | Data Science Friday |
| 29 | 1 | 8 | Origins and earth systems   * Complete evidence worksheet\_02 in “Eon” Groups * Storm the board |  |  |
| 31 | 1 | 9 | Origins and earth systems   * Review timeline * Provide assessment prompt and discuss writing assignment\_01 * Initiate problem set\_02 in “Eon” groups | Reading: Falkowski PG *et al*. 2008. Science.  Reading: Zehnder AJB and Stumm W. 1988. Chapter 1  Writing assignment\_01  Problem set\_02 |  |
| **February** |  | | | | |
| 2 | 1 | 10 | Working with data in R continued | Tutorial: Working with Data | Data Science Friday |
| 5 | 1 | 11 | Origins and earth systems   * Complete problem set\_02 in “Eon” groups * Form grab bag groups and discuss “Microbial Engines” questions | Reading: Shrag DP. 2012. Fund Geobiol  Reading: Rockstrom J *et al*. 2009. Nature  Reading: Canfield DE *et al*. 2010. Science  Reading: Waters CN *et al*. 2016. Science | Statistical Models workshop begins |
| 7 | 1 | 12 | Origins and earth systems   * Complete grab bag activity * Form debate groups |  |  |
| 9 | 2 | 1 | Origins and earth systems   * Groups debate “Spaceship Earth” versus “Microbial Engines” worldviews | Handout: debate summary  Handout: Introduction to sequencing (supergraphic\_03)  Problem set\_03  Data Science Friday at home: Graphics with ggplot |  |
| 12 | Family Day | | | | |
| 14 | 2 | 2 | Remapping the body of the world   * Recap Module 01 * Begin instructor presentation | Reading: Wooley J *et al*. 2009. PLoS Com Bio  Reading: Madsen EL. 2005. Nature Rev |  |
| 16 | 2 | 3 | Remapping the body of the world   * Complete instructor presentation * Initiate problem set\_03 based on grab bag groups * Collect writing assignment\_01   + If you would like in-depth feedback, bring a printed copy. | Portfolio Check |  |
| 19-23 | Reading Week | | | | |
| 26 | 2 | 4 | Remapping the body of the world   * Complete problem set\_03 | Evidence worksheet 03: Canfield DE *et al.* 2010. Science, Rockstrom J *et al*. 2009 Nature, OR Waters CN *et al*. 2016. Science  Reading/Evidence worksheet 04: Martinez A *et al.* 2007. PNAS |  |
| 28 | 2 | 5 | Remapping the body of the world   * Complete evidence worksheet \_04 | ~~Writing assignment\_02~~ |  |
| **March** |  | | | | |
| 2 | 3 | 1 | Microbial Species Concepts   * Counting candy microbes * Initiate problem set \_04 | Reading: Kunin V *et al*. 2010. Environ Micro  Reading: Sogin ML *et al*. 2006. PNAS  Reading: Gaudet AD *et al*. 2010. Plos One  CATME account setup and survey |  |
| 5 | 3 | 2 | Microbial Species Concepts   * Counting candy microbes continued * Alpha- and beta-diversity * Complete problem set \_04 |  |  |
| 7 | 3 | 3 | Project 1   * Introduce working with amplicon sequence data project\_01 * OTU vs. ASV | Reading: Hawley AK *et al.* 2017. Sci Data  Reading: Callahan BJ *et al*. 2017. ISME | Steven at Ontario Genomics Meeting |
| 9 | 3 | 4 | Project 1   * Introduction to Saanich by Alyse * Project\_01 group work | Reading: Torres-Beltran M *et al*. 2017. Sci Data  Reading: Hallam SJ *et al*. 2017. Sci Data | Steven at JGI Advisory Meeting |
| 12 | 3 | 5 | Project 1   * Project\_01 group work |  | JGI Users Meeting |
| 14 | 3 | 6 | Project 1   * Introduction to statistics * Project\_01 group work |  | JGI Users Meeting |
| 16 | 3 | 7 | Project 1   * Project\_01 group work |  | JGI Users Meeting |
| 19 | 3 | 8 | Microbial Species Concepts   * Initiate instructor presentation * Begin evidence worksheet\_05 | Reading/Evidence worksheet 05: Welch RA *et al*. 2002. PNAS | Advanced intro workshop begins |
| 21 | 3 | 9 | Microbial Species Concepts   * Complete evidence worksheet\_05 * Provide assessment prompt and discuss writing assignment\_03 | Writing assignment\_03 (Please still refer to as #3 even though #2 was cancelled.) |  |
| 23 | 4 | 1 | Distributed metabolic networks (Project 2)   * Introduce working with metagenomics data project\_02 |  |  |
| 26 | 4 | 2 | Project 2   * Project\_02 group work |  |  |
| 28 | 4 | 3 | Project 2   * Project\_02 group work |  |  |
| 30 | Good Friday | | | | |
| **April** |  | | | | |
| 2 | Easter Monday | | | | |
| 4 | 4 | 4 | Project 2   * Project\_02 group work |  |  |
| 6 | 4 | 5 | Distributed metabolic networks   * Course recap and coffee discussion * Collect writing assignment\_03   + If you would like in-depth feedback, bring a printed copy. |  | Last Class |
| 10-25 |  |  | * Complete and refine course portfolios * **Portfolios due April 25 at 5PM** |  | Finals |

**NOTE: Additional R workshops will be added in February and March. Dates to be determined. Additional workshops focused on microbiome data are also being considered as co-curricular vehicles in sync with MICB 425 content.**