Daily Schedule (version 1.6 – 7/9/22)

1. Monday July 11 — *Low tides for the day are always listed here, with time and tidal height (in feet):* 3:05 am (-0.3), 3:12 pm (0.4)

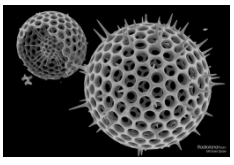
2:45 – 4:00 Portsmouth to Appledore
4:00 – 6:00 Unload and move-in; Island orientation ("Fire and Water"; SML staff)
6:00 – 7:00 Dinner
7:15 – 8:30 Island tour (EMD faculty); course introduction; *Signals for Survival* movie

2. Tuesday July 12 — 4:03 am (-0.7), 4:09 pm (0.2)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Physical environment of the Gulf of Maine (**Allmon**)
10:00 – 11:00 **Lab exercise:** "Why do these organisms look like this?" (**Allmon**)
11:15 – 12:15 **Lecture:** Why do we think evolution is true? (**Allmon**) **READING:** Allmon (2009), pp. 9-46; Dobzhansky (1973); Gould (1981)
12:30 – 1:30 Lunch
1:30 – 2:45 **Lecture:** Origin of life (**Allmon**)
3:00 – 4:00 **Lecture:** Daily Diversity 1: Algae & the origin of plants (**Factor**)
4:15 – 6:00 **Field & Lab:** Intertidal Field Trip #1 (Smith's Cove, SW) (**Factor**)
6:00 – 7:00 Dinner
8:00 – **Rock Talk:** Dr. Catherine Mattase, "Fear and Hiding in New England: Tales from Rocky Shores"

3. Wednesday July 13 — 4:49 am (-1.1), 5:06 pm (0.0)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Daily Diversity 1: Algae & the origin of plants (**Factor**) (continued)
10:00 – 11:00 **Art** with artist-in-residence Ashley Williams
11:15 – 12:30 **Lecture:** Microevolution, heritability, and Mendelian inheritance (**Mittan**)
12:30 – 1:30 Lunch
1:30 – 3:00 **Lecture:** Daily Diversity 2: Protists and the tree of life (**Allmon**)
3:15 – 4:15 **Lab:** *Nucella* sorting (**Mittan**)
4:30 – 5:45 **Field & Lab:** Intertidal Field Trip #2 (Larus Ledge, NW) (**Factor**)
6:00 – 7:00 Dinner
7:15 – 8:45 **Lecture:** Mendelian inheritance and population genetics (**Mittan**)



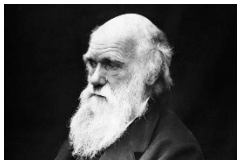
4. Thursday July 14 — 5:55 am (-1.3), 6:03 pm (-0.2)

7:30 – 8:00 Breakfast
8:15 – **Quiz #1**
8:30 – 9:45 **Lecture:** Evolutionary mechanisms: selection, drift, migration, mutation (**Mittan**)
10:00 – 11:00 **Lecture:** Intro to invertebrate diversity (**Factor**)
11:15 – 12:15 **Lab:** Sea table exercise (**Factor**, **Allmon**)
12:30 – 1:30 Lunch
1:45 – 2:45 *Nucella* sorting recap (**Mittan**)
3:00 – 4:30 **Lecture:** Daily Diversity 3: Plants (**Allmon**)
4:45 – 5:45 **Field:** Plant walk (**Allmon**)
6:00 – 7:00 Dinner
7:15 – 8:45 **Lab:** Protists (**Allmon**/**Factor**)

5. Friday July 15 — 6:50 am (-1.4), 6:59 pm (-0.2)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Daily Diversity 4: Sponges (**Factor**)
10:00 – 2:00 Whale watch
2:00 – 3:00 clean up/regroup
3:00 – 4:30 **Lecture:** Evolutionary mechanisms, continued (**Mittan**)
4:45 – 5:45 **Art** with artist-in-residence Ashley Williams
6:00 – 7:00 Dinner
7:15 – 8:45 **Lecture:** Daily Diversity 5: Non-coral Cnidarians (**Factor**)

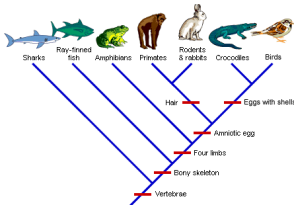
6. Saturday July 16 — 7:43 am (-1.3), 7:55 pm (-0.1)



7:30 – 8:00 Breakfast
8:15 – **Quiz #2**
8:30 – 9:45 **Lecture:** A brief history of evolutionary biology (**Allmon**) **READING:** Allmon (2009) pp. 17-31.
10:00 – 12:00 Sea table evolutionary tree activity presentations
12:30 – 1:30 Lunch
1:45 – 3:45 **Lab:** Sponges and Cnidarians (**Factor**)
4:00 – 5:45 **Lecture:** History of the Earth and life (**Allmon**) **READING:** Freeman & Herron (2007) Ch. 18
6:00 – 7:00 Dinner
7:15 – 8:45 **Lecture:** Daily Diversity 5 (continued): Corals and coral reefs (**Factor**)

7. Sunday July 17 — 8:36 am (-1.1), 8:53 pm (0.0)

9:00 – 10:00 **Lecture:** Genetics wrap-up (**Mittan**)
10:00 – 11:00 Brunch
11:15 – 12:45 **Lecture:** Daily Diversity 6: Lophotrochozoa (**Factor**)
1:00 – 3:00 **Lab:** Lophotrochozoa (**Factor**)
3:15 – 4:15 **Exercise:** "The great clade race" (**Shin**)
5:00 – 6:00 Dinner
6:15 – 7:45 **Lecture:** Systematics, part 1 (**Allmon**) **READING:** Freeman & Herron (2007) Ch. 4

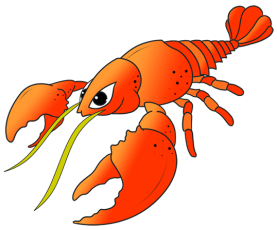


8. Monday July 18 — 9:29 am (-0.7), 9:52 pm (0.2)

7:30 – 8:00 Breakfast
8:15 – **Quiz #3**
8:30 – 10:30 **Field & Lab:** Intertidal Field Trip #3 (Halftide Ledges, SW)
10:45 – 12:15 **Lecture:** Systematics, part 2 (**Allmon**)
12:30 – 1:30 Lunch
1:45 – 3:15 **Lecture:** Daily Diversity 7: Mollusks etc. (**Factor**)
3:30 – 5:45 **Lab:** Mollusk Madness! (**Factor**, **Allmon, Shin**)
6:00 – 7:00 Dinner
8:00 – **Discussion:** Genetics review Q&A (**Mittan**)

9. Tuesday July 19 — 10:22 am (-0.2), 10:53 pm (0.5)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Daily Diversity 8: Ecdysozoa (**Factor**)
10:00 – 12:15 **Lab:** Lobsterfest! (**Factor**)
12:30 – 1:30 Lunch
1:45 – 3:15 **Lecture:** Systematics, part 3 – Phylogenetic reconstruction (**Allmon**)
3:15 – 6:00 **FREE/STUDY TIME**
6:00 – 7:00 Dinner
7:15 – Review for Lab Practical (all faculty), then study time



10. Wednesday July 20 — 11:16 am (0.3), 11:54 pm (0.7)

7:30 – 8:00 breakfast
8:15 – 11:15 **Preliminary Written Exam & Practical Exam**
11:15 – 12:30 **FREE TIME!**
12:30 – 1:30 Lunch
1:30 – 2:30 **Lecture:** Natural selection and adaptation, part 1 (**Allmon**)
READING: Allmon (2009) pp. 48-55

2:45 – 4:00 Group project: Intro and methods for field transects (**Allmon**, **Factor**)
4:15 – 5:45 **Lecture:** Natural selection and adaptation, part 2 (**Allmon**)
READING: Gould & Lewontin (1979); Kricher (1988)
6:00 – 7:00 Dinner
7:15 – 8:45 **Lecture:** Biogeography and evolution (**Allmon**)

11. Thursday July 21 — 12:10 pm (0.8)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Daily Diversity 9a: Deuterostomia, part 1: Nonvertebrate chordates (**Factor**)

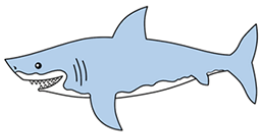
Field Trip to Creek Farm (mainland) MUD FLAT HABITAT!
10:45 – Depart Appledore
~11:15 – 1:00 Fieldwork & collecting
~1:00 – Lunch at Creek Farm
~1:30 – Depart Creek Farm
~2:15 – Arrive Appledore – rinse off equipment, unpack organisms in lab

3:00 – 5:00 **Lecture:** Daily Diversity 9b: Deuterostomia, part 2: Echinodermata (**Factor**)
5:00 – 6:00 Dinner
6:15 – 7:45 **Lab:** Echinoderms and nonvertebrate chordates (**Factor**)

2. Friday July 22 — 12:56 am (0.8), 1:06 pm (1.2)

Student art show?

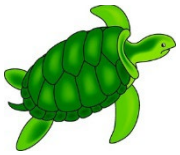
7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Species and speciation, part 1 (**Allmon**)
9:45 – 12:30 Project field time
12:30 – 1:30 Lunch
1:45 – 3:15 Daily Diversity 10: Vertebrates 1 – Fishes (**Allmon**)
3:15 – 5:30 **Lab:** Fishes (**Allmon**)
6:00 – 7:00 Dinner
7:15 – 8:30 Species and speciation, part 2 (**Allmon**)



13. Saturday July 23 — 1:58 am (0.8), 2:03 (1.5)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Origin of tetrapods (**Allmon**)
10:00 – 12:30 Project field time

12:30 – 1:30 Lunch
1:45 – 3:15 **Lecture:** Daily Diversity 11: Vertebrates 2 – Reptiles & Birds (**Allmon**)
3:30 – 5:30 **Lab:** Reptiles & Birds (**Allmon**)
6:00 – 7:00 Dinner
7:15 – 8:45 **Lecture:** Macroevolution (**Allmon**)



14. Sunday July 24 — 2:56 (0.8), 2:57 (1.6)

10:00 – 11:00 Brunch
11:15 – 12:45 **Lecture:** Evolution of behavior (**Allmon**)
12:45 – 3:15 Project field time
3:30 – 5:00 **Lecture:** Sexual selection (**Allmon**)
5:00 – 6:00 Dinner
7:15 – 8:45 **Lecture:** Life history evolution (**Allmon**)

15. Monday July 25 — 3:47 am (0.7), 3:46 pm (1.6)

7:30 – 8:00 Breakfast
8:30 – 10:00 **Lecture:** Daily Diversity 12: Vertebrates 3 -- Mammals (**Allmon**)
10:15 – 12:15 **Lab:** Mammals (**Allmon**)
12:30 – 1:30 Lunch
1:45 – 2:45 **Lecture:** Evolution and development (**Allmon**) **READING**: Alberch (1986)
2:45 – 5:45 Project field time
6:00 – 7:00 Dinner
Project paper & study time

16. Tuesday July 26 — 4:33 am (0.6), 4:31 pm (1.5)

7:30 – 8:00 Breakfast
8:15 – 9:45 **Lecture:** Humanity as an evolutionary force (**Allmon**) **READING**: Steffen et al. (2007)

9:45 – 12:30 Project paper & study time
12:30 – 1:30 Lunch
1:30 – 6:00 Project paper & study time
6:00 – 7:00 Dinner
8:00 – **Rock Talk:** Dr. Leah Gerber, "Trace metal influence on the microalgal circle of life: Relationships, food, stress, and death"

17. Wednesday July 27 — 5:16 am (0.4), 5:12 pm (1.4)

7:30 – 8:00 Breakfast
Project paper & study time

12:30 – 1:30 Lunch
Project paper & study time
6:00 – 7:00 Dinner

Project paper & study time

18. Thursday July 28

7:30 – 8:00 Breakfast
8:15 – 11:15 **Final Written Exam & Practical Exam**
12:30 – 1:30 Lunch
1:30 – 6:00 Lab cleanup and FREE TIME
6:00 – 7:00 Dinner

19. Friday July 29 — 6:31 am (0.3), 6:28 pm (1.2)

7:30 – 8:00 Breakfast
10:15 – Boat from Appledore to Portsmouth

"It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved."

- Charles Darwin, *On the Origin of Species* (1859), pp. 489-490