

Lecture = Classroom instruction (unless otherwise noted, all lectures in MBL's Speck Auditorium)

Demo = Instructor physically demonstrates lecture concepts

Hands-on = students practice concepts with computers

Lab = Students participate in hands-on lab activities

Discussion = Group discussion

Tour = Visit site at MBL or WHOI, but no hands-on lab work

Yellow = Segment 1 (Carbonate system measurements)

Blue = Segment 2 (OA experimental set-up: biology/chemistry)

Orange = Segment 3 (Biogeochemical modeling)

Green = Segment 4 (Data reporting)

WEEK 1	NOVEMBER 2 MONDAY	NOVEMBER 3 TUESDAY	NOVEMBER 4 WEDNESDAY	NOVEMBER 5 THURSDAY	NOVEMBER 6 FRIDAY	NOVEMBER 7 SATURDAY	NOVEMBER 8 SUNDAY
Morning Period 1 (8:30-10:00)	Lecture. Carbonate system overview (Sabine/Dickson)	Lecture. pH and Alkalinity (Dickson)	Lecture/Discussion. Quality control and advantages/disadvantages of analytical measurements of CO2 parameters (Dickson/Wang)	Lecture. Overview on approaches and tools to manipulate seawater carbonate chemistry (Gattuso)	Lecture. Algal culturing overview (Iglesias-Rodriguez)	Lab. T2 sampling for corals, pH monitoring for mollusk exp't (Holcomb)	Free
Morning Period 2 (10:30-12:00)	Lecture/Hands-on. Intro to CO2SYS and seacarb (Sabine and Gattuso)	Lecture. Overview on biogeochemical feedbacks (Hutchins)	Lecture/Discussion. Implications of uncertainties in equilibrium constants and analytical measurements and choosing optimal parameters to measure for an experiment (Dickson/Sabine)	Lecture/Demo. Moored CO2 instrument demo (Sabine)	Lecture. Calcification overview (bkgd for coral calcification and larval mollusk exp'ts), methods for measuring coral and bivalve calcification (Cohen/Miller)	Lecture. Radioisotope Techniques for measuring coccolithophore calcification (Balch) and PIC methods for quantifying calcification (Iglesias-Rodriguez)	
Afternoon Period (13:30-17:30)	Lecture/Lab. Lab safety presentations followed by sampling instruction (movie plus hands-on) and underway pCO2 introduction and demo (Groups A/B/C)	Lab. pH and infrared DIC measurements, coulometric DIC setup demo (Groups D/E/F)	Lab. TA and DIC measurements (Groups D/E/F)	Lab/Hands-on. Lecture/Demo/Hands-On. Theoretical CO2SYS (Yates) experiments and setup for larval mollusk experiments (McCorkle)	Lab. Coral calcification setup (Holcomb - Groups G/H/I)	Lab. T3 sampling for corals (Holcomb)	Lab. T4 sampling for corals and coral exp't breakdown, pH monitoring for mollusks. (Holcomb)
Evening Period (19:00-22:00)	WELCOME RECEPTION AND POSTER SESSION, WHOI Clark 507		Lecture. Overview onf ocean acidification experimental design (Langdon)		Tour. Bernhard lab Lab. Larval mollusk inoculations (White/McCorkle). Coral T1 sampling (Holcomb)	Lecture. Measuring calcification in the field (Langdon)	

WEEK 2	NOVEMBER 9 MONDAY	NOVEMBER 10 TUESDAY	NOVEMBER 11 WEDNESDAY	NOVEMBER 12 THURSDAY	NOVEMBER 13 FRIDAY
Morning Period 1 (8:30-10:00)	Lab. Larval mollusk harvesting (Cohen/Rose/White)	Lecture. Biogeochemical modeling overview (Doney)	Lecture/Hands-on. Large databases (e.g., GLODAP), etc. (Key)	Lecture. Introduction to Data Management and Better Practices for Shipboard Data Management (Chandler)	Lecture. Data reporting overview (Kozyr)
Morning Period 2 (10:30-12:00)		Lecture. Physiology (Seibel)	Lecture. Genomics applications to ocean acidification research (Fangue)	Lecture. Biogeochemical Modeling Part II (Doney)	Course wrap-up: Open discussion and course evaluations
Afternoon Period (13:30-17:30)	Lecture/Hands-on. Ocean Data View (Schlitzer)	Lab. Larval mollusk microscopy (Cohen/Rose) Cellular pH setups and initial pH measurements (Seibel)	Lab/Hands-On. Cellular pH final measurements and respirometry demo (Seibel)	Synthesis and discussion	Departures
Evening Period (19:00-22:00)	Tours. MBL Marine Resources Center and Waterbury algal culturing lab		Lab. Modeling exercises (Doney)	FAREWELL DINNER, MBL	