

UNIVERSITY
OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Undergraduate Marine & Atmospheric
Science Program
STUDENT ADVISING GUIDE
2010-2011

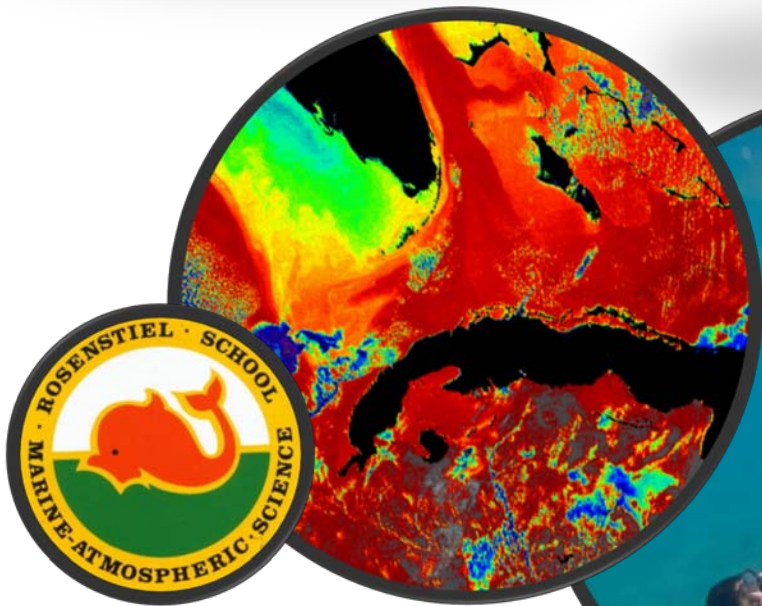




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INTRODUCTION

Marine Science has been part of the academic curriculum at the University of Miami since 1949, when the Marine Laboratory, now known as the Rosenstiel School of Marine and Atmospheric Science (RSMAS), initiated a program of studies leading to the Master of Science degree. Today, RSMAS is one of the largest oceanographic institutes in the country with a faculty of over a hundred scientists who conduct sponsored research and engage in academic training. In 1977, the College of Arts and Sciences and RSMAS joined together to establish an undergraduate Marine and Atmospheric Science Program. The degree granting authority for this program was formally transferred to the Rosenstiel School in 2008.

Our curriculum is designed to take full advantage of the University's subtropical location, with year-round access to a variety of marine environments including the deep ocean waters offshore, the coral reef tracts of the Florida Keys, and the estuarine sea grass beds and mangrove shoreline of South Florida. Students are introduced to the general complexities of the ocean and atmosphere through lectures, laboratories and field trips. Undergraduate students are encouraged to work with the faculty in their laboratories, and are able to earn course credit by conducting independent research under the supervision of leading scientists in their field.

FOR ADDITIONAL INFORMATION:

Marine and Atmospheric Science Program
University of Miami
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182 Cox Science Building
Coral Gables, FL 33124-0411

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Undergraduate Curriculum for Marine and Atmospheric Science Program

Marine and Atmospheric Science is an interdisciplinary program dealing with the study of the world's oceans and atmosphere: their physical and biological constituents, the influence of oceanic resources on human society and the conservation and future development of those resources.

The program offers the following areas of study:

Marine Affairs and Policy

Marine Affairs prepares students to contribute to the policy development and management of marine resources through integration of scientific, economic and social perspectives. Research at UM focuses on aquaculture, fisheries management, political ecology, natural resource economics, coastal zone management, marine spatial planning and marine protected areas, coastal and ocean law, and marine cultural resources

Marine Biology and Fisheries

Marine biologists study the structure and function of marine organisms from the cell and molecular level to their role in ecosystem function. Research at UM focuses on tropical marine and coral reef ecology, fisheries conservation and management, and the use of marine organisms as models for environmental stress and human disease.

Marine and Atmospheric Chemistry

Marine chemists study the biogeochemical cycling of nutrients, the impact and fate of marine pollutants, ocean/atmosphere interactions. Research at UM focuses on the role of ocean processes in carbon cycling and global climate change.

Marine Geology and Geophysics

Marine geologists study the origin of the Earth and its oceans, and the ongoing processes of geophysical and geochemical change. Research at UM focuses on carbonate sedimentology of the Florida reef tract, stable isotope geochemistry and micropaleontology of deep ocean cores to reconstruct paleoclimate, tectonic processes (volcanoes and earthquakes), and the impact of rising sea level on coastal systems.

Meteorology

Meteorologists study the physical processes governing the motion and composition the atmosphere. Research at UM focuses on atmospheric dynamics and atmosphere-ocean coupling in the tropical, subtropical, and coastal marine regions. UM meteorologists have developed a state-of-the-art coupled atmosphere-wave-ocean model for hurricane research and prediction.

Physical Oceanography

Physical oceanographers study the spatial and temporal variability in the ocean and atmosphere. Measurements from current meters, profilers and satellites are used to develop models of ocean circulation, water and heat transport, and effects of circulation patterns on the biology and chemistry of the ocean. Research at UM focuses on ocean/atmosphere interactions, remote sensing, and the ocean's affect on weather and climate.

Marine Computing

Computer scientists provide the skills and expertise required for research in applied aspects of ocean science and management. Research at UM focuses on development of algorithms for data capture, visualization and analysis, model development, instrumentation programming and remote sensing applications.



BACHELOR OF SCIENCE CURRICULA IN MARINE SCIENCE

The Rosenstiel School of Marine and Atmospheric Science offers a Bachelor of Science in Marine and Atmospheric Science degree (B.S.M.A.S.) with majors in Marine Science/Biology, Marine Science/Chemistry, Marine Science/Geological Sciences, Marine Science/Physics and Marine Science/Computer Science.

The double major prepares students for admission to graduate programs and for careers in teaching and research as well as for technical careers in government and private industries concerned with the oceans and atmosphere.

Each of the areas of concentration constitutes a rigorous program requiring 120-130 credits for graduation. Only those courses passed with a grade of "C-" or better may be applied to the major or minor.

The General Education Requirements for the B.S.M.A.S. degree are:

English Composition (6 credits: ENG105 and ENG106 or ENG107)

Humanities (12 credits)

Social Sciences (12 credits)

Mathematics - two semesters of calculus-MTH161, MTH162; one approved statistics or computer programming course

Foreign Language (3 credits at the 200 course level or higher)

Five writing intensive courses beyond ENG105 and 106 or 107.

MINOR IN MARINE SCIENCE

A minor in Marine Science requires Marine Science 111, 215, 230, Geological Sciences 110 or GSC111, and 3 credits of Marine Science elective.



MARINE SCIENCE/BIOLOGY

Marine Science 111, 215, 216, 230, 232, 301, Geological Science 110/114 or GSC111 and elective credits in Marine Science for a total of 25 credits

Biology 150, 151, 160, 161, 235, 250, 255, 265 and twelve credits of elective as described for Biology majors for a total of 34 credits

Chemistry 111, 112, 113, 114, 201, 202, 205, 206

Mathematics 161,162 and one semester of a computer programming or statistics course.

Physics 205, 206, 207, with one laboratory; or 205, 210 with one laboratory; or 101, 102, 106 and 108

*MSC 230 and one 300 level Biology elective count towards both the Marine Science and Biology major.

SAMPLE CURRICULUM – MARINE SCIENCE/BIOLOGY

Freshman Year				Sophomore Year			
MSC 111	3 cr	BIL 160	4 cr	BIL 150	4 cr	BIL 250	3 cr
CHM 111	3	BIL 161	1	BIL 151	1	MSC 215	3
CHM 113	1	CHM 112	3	MSC 230	3	MSC 216	1
ENG 105	3	CHM 114	1	MSC 232	1	GSC110/114	5
HUM	3	ENG 106	3	MTH 162	4	LAN	3
SSC	<u>3</u>	MTH 161	<u>4</u>	LAN	3	HUM	<u>3</u>
	16 cr		16 cr		16cr		18 cr

Junior Year				Senior Year			
BIL 255	3 cr	BIL 235	3 cr	PHY 206	3 cr	MSC 301	3 cr
CHM 201	3	BIL 236	1	BIL 265	3	BIL/MSC	4
CHM 205	1	CHM 202	3	PHY Lab	1	HUM	6
SSC	3	CHM 206	1	MSC	3	PHY 207	<u>3</u>
STAT	4	PHY 205	3	BIL	4		16 cr
LAN	<u>3</u>	SSC	3	SSC	<u>3</u>		
	17 cr	HUM	<u>3</u>		17 cr		
			17 cr				



MARINE SCIENCE/CHEMISTRY

Marine Science 111, 215, 216, 230, 232, 301, Geological Sciences 110/114 or GSC111 and credits of elective in Marine Science for a total of 25 credits

Biology 150 or 160

Chemistry 111, 112, 113, 114, 201, 202, 205, 206, 304, 316, 320, 360, 364, 365, and one of 401, 416, 520, 563, or Biochemistry and Molecular Biology 401 or 506 as described for the Chemistry major.

Mathematics 161-162 and one semester of a computer programming or statistics course.

Physics 205, 206, 207, with one laboratory; 205, 210 with one laboratory; or 101, 102, 106 and 108

SAMPLE CURRICULUM - MARINE SCIENCE/CHEMISTRY

Freshman Year				Junior Year			
MSC 111	3 cr	CHM 112	3 cr	CHM 304	3cr	CHM	3 cr
CHM 111	3	CHM 114	1	MSC 230	3	MSC	3
CHM 113	1	MTH 162	4	MSC 232	1	PHY 206	3
ENG 105	3	ENG 106	3	PHY 205	3	LAN	3
MTH 161	<u>4</u>	SSC	3	LAN	3	SSC	<u>3</u>
	14 cr	HUM	<u>3</u>	HUM	<u>3</u>		15 cr
			17 cr		16 cr		
Sophomore Year				Senior Year			
CHM 201	3 cr	CHM 202	3 cr	CHM 360	3 cr	CHM 316	3cr
CHM 205	1	CHM 206	1	CHM 364	1	CHM 365	3
STAT	4	GSC 110	3	PHY 207	3	MSC 301	3
BIL150	4	GSC 114	2	PHY 208/9	1	HUM	3
SSC	<u>3</u>	MSC 215	3	MSC	3	SSC	3
	15 cr	MSC 216	1	HUM	<u>3</u>	CHM 320	<u>2</u>
		LAN	<u>3</u>		16 cr		
			16 cr		14 cr		17 cr



MARINE SCIENCE/GEOLOGICAL SCIENCES

Marine Science 111, 215, 216, 230, 231 or 232, 301, and six credits of elective in Marine Science
 Biology 150/151 or 160/161

Chemistry 111, 112, 113, 114

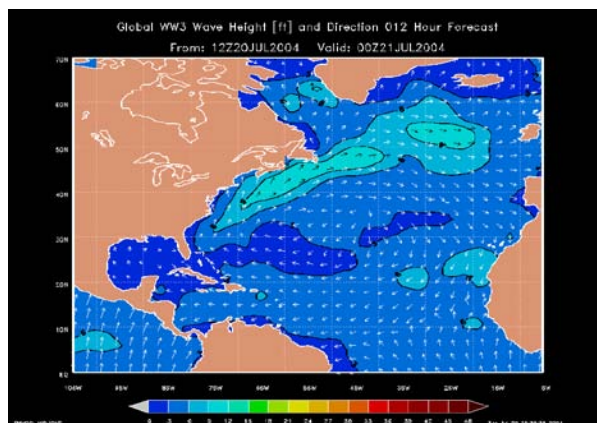
Geological Sciences 110,111,114, 260,360,410 or 420, 440, 480,482, and 580 as described for the
 Geological Sciences major

Mathematics 161-162 and one semester of a computer programming or statistics course.
 Physics 205, 206, 207, with one laboratory; 205, 210 with one laboratory; or 101, 102, 106 and
 108

*Geological Sciences 110/114 may fulfill requirements in both Marine Science and Geology

SAMPLE CURRICULUM – MARINE SCIENCE/GEOLOGICAL SCIENCES

Freshman Year				Sophomore Year			
MSC 111	3 cr	GSC 110	3 cr	GSC 260	4 cr	MSC 215	3 cr
GSC 111	4	GSC 114	2	MTH 161	4	MSC 216	1
CHM 111	3	CHM 112	3	BIL 150	4	MTH 162	4
CHM 113	1	CHM 114	1	BIL 151	1	GSC 360	4
ENG 105	3	ENG 106	3	SSC	<u>3</u>	Comp/Stat	<u>4</u>
SSC	<u>3</u>	HUM	<u>3</u>		16 cr		16 cr
	17 cr		15 cr				
Junior Year				Senior Year			
GSC 410	3 cr	GSC 480	4 cr	GSC 482	2 cr	GSC	6 cr
MSC 230	3	PHY 206	3	GSC 574	1	MSC 301	3
MSC 232	1	PHY	1	GSC	3	SSC	3
PHY 205	3	MSC	3	PHY 207	3	HUM	<u>3</u>
LAN	3	SSC	3	MSC elec	3		15 cr
HUM	<u>3</u>	LAN	<u>3</u>	LAN	3		
	16 cr		17 cr	HUM	<u>3</u>		
					18 cr		
Summer Field Camp GSC 580		4 cr					



MARINE SCIENCE/PHYSICS

Marine Science 111, 215, 216, 230, 231 or 232, 301, Geological Sciences 110, 114 and six credits of elective in Marine Science for a total of 25 credits

Biology 150/151 or 160/161

Chemistry 111, 112, 113, 114

Mathematics 161, 162, 210, 312, and one semester of a computer programming or statistics course. The following classes are approved to satisfy the computer/statistics requirement: Computer Science 120, Mathematics 224, Electrical and Computer Engineering 117 or 118.

Physics 205, 206, 207, 208, 209, 321, 340, 350, 351, 360, 506, and 560. (Physics 210 may be substituted for Physics 206 and 207)

SAMPLE CURRICULUM – MARINE SCIENCE/PHYSICS

Freshman Year				Sophomore Year			
MSC 111	3 cr	MTH 162	4 cr	PHY 207	3 cr	BIL 150	4cr
MTH 161	4	CHM 111	3	PHY 209	1	BIL 151	1
PHY 205	3	CHM 113	1	MTH 210	3	MSC 215	3
ENG 105	3	PHY 206	3	MTH 211	3	MSC 216	1
HUM	<u>3</u>	PHY 208	1	HUM	3	MTH 311	3
		ENG 106	<u>3</u>	CHM 112	4	SSC	3
	16 cr		15 cr	CHM 114	<u>1</u>	LAN	<u>3</u>
					18cr		18 cr

Junior Year				Senior Year			
GSC 110	3 cr	PHY 321	3 cr	PHY 560	3 cr	PHY 506	1 cr
GSC 114	2	PHY 351	3	LAN	3	MSC elec.	3
PHY 340	3	MSC 301	3	HUM	3	LAN	3
MSC 230	3	Comp/Stat	4	SSC	3	MSC elec.	3
MSC 232	1	HUM	<u>3</u>	MSC elec.	<u>3</u>	SSC	<u>3</u>
PHY 360	3		16 cr		15 cr		13cr
SSC	<u>3</u>						
	18 cr						

MARINE SCIENCE/COMPUTER SCIENCE

Marine Science 111, 215, 216, 230, 232, 301, six credits of elective in Marine Science
 Biology 150/151 or 160/161
 Chemistry 111, 112, 113, 114
 Geological Sciences 110, 114
 Mathematics 161, 162, 309
 Computer Science 119, 120, 220, 314, 322, 531 and 6 credits of elective
 Physics 205, 206, 207 and one semester of laboratory or Physics 101, 102, 106 and 108



SAMPLE CURRICULUM – MARINE SCIENCE/COMPUTER SCIENCE

FRESHMAN YEAR

MSC 111	3	CSC 120	4
MTH 161	4	ENG 106	3
ENG 105	3	MTH 162	4
CSC 119	3	HUM	3
HUM	<u>3</u>	SSC	<u>3</u>
	16 cr		17 cr

SOPHOMORE YEAR

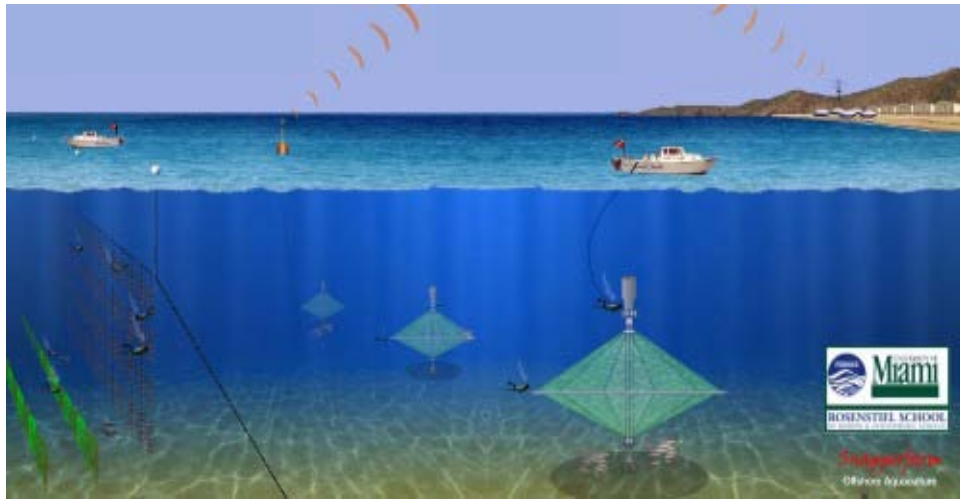
CHM 111	3	CHM 112	3
CHM114	1	CHM 114	1
CSC220	4	MSC 215	3
GSC 110	3	MSC 216	1
GSC 114	2	LAN	3
SSC	<u>3</u>	SSC	3
	16 cr	HUM	<u>3</u>
			17 cr

JUNIOR YEAR

PHY 205	3	PHY 206	3
MTH 309	3	CSC 322	3
CSC 314	3	MSC 301	3
LAN	3	LAN	3
HUM	<u>3</u>	BIL 160	4
	15 cr	BIL161	<u>1</u>
			17 cr

SENIOR YEAR

PHY 207	3	CSC ELECT	6
PHY208	3	MSC ELECT	5
MSC 230	3	ELECTIVE	<u>5</u>
MSC 232	1		16 cr
CSC 531	3		
SSC	<u>3</u>		
	16 cr		



BACHELOR OF ARTS IN MARINE AFFAIRS

The Rosenstiel School of Marine and Atmospheric Science (RSMAS) and the College of Arts and Sciences jointly offer a Bachelor of Arts in Marine Affairs degree with a major in Marine Affairs and a minor in Anthropology, General Business, Communication, Economics, Ecosystem Science and Policy, Geography and Regional Studies, International Studies, or Political Science. This program is designed for students who wish to prepare themselves for graduate studies and careers in ocean related areas of business, policy, management, law, and communication.

Bachelor of Arts students are required to complete 53-60 credits of the general education requirements of the College of Arts and Sciences along with the core requirements for a major in Marine Affairs and chosen minor.

The General Education Requirements for the B.A.M.A. degree are:

English Composition (6 credits: ENG 105 and ENG 106 or ENG 107)

Humanities (12 cr)

Social Sciences (12 credits which must include ECO 211)

Mathematics (3 credits above MTH107)

The required Marine Affairs courses are:

Biology 150,160

Chemistry 111,112

Marine Science 111, 215, 230, 313 or 314, 345, Geological Sciences 110 or 111 and six credits of approved electives in Marine Science

One approved course in computer programming or statistics

Courses, which satisfy the minor, are listed in the University Bulletin under the individual departments. Choice of courses for the minor must be approved by an advisor.



SAMPLE CURRICULUM – MARINE AFFAIRS

Freshman Year				Sophomore Year			
MSC 111	3 cr	HUM	3 cr	BIL 150	4 cr	BIL 160	4 cr
MTH 101	3	MTH 113	3	MINOR	3	MINOR	3
ENG 105	3	ENG 106	3	LAN	3	LAN	3
HUM	3	GSC 110	3	ECO 211	3	ELECTIVE	3
SSC	<u>3</u>	ELECTIVE	3	HUM	<u>3</u>	HUM	<u>3</u>
	15 cr		15 cr		16 cr		16 cr

Junior Year				Senior Year			
MSC 230	3 cr	MSC	3 cr	300 ELECT	3	ELECT	3cr
MSC 313	3	MINOR	3	MINOR	3	MINOR	3
CHM 111	4	CHM 112	4	ELECT	3	MSC 215	3
LAN	3	STAT	3	SSC	3	MSC	3
300 ELECT	<u>3</u>	MSC 345	<u>3</u>	MSC	<u>3</u>	SSC	<u>3</u>
	16 cr		16 cr		15 cr		15 cr

METEOROLOGY



Course Requirements

Marine and Atmospheric Science (29 credits):

MSC103, MSC111, MSC118, MSC243, MSC303, MSC305, MSC405, MSC406, MSC407, MSC409.

Mathematics (20 credits)*:

MTH161, MTH162, MTH210, MTH224, MTH310, and MTH311**

*Double majors in ECS and CBR must take either MTH224 or MTH311, but are not required to take both.

**Students may substitute MTH320 for MTH311.

Physics and Chemistry (14 credits):

PHY205, PHY206, PHY207, PHY208. CHM111, CHM113.

Computer Science (4 credits):

CSC120 or suitable elective.

Electives: In addition, students must complete a minimum of 15 additional credits hours of which at least 12 must be from Biology, Chemistry, Computer Science, Ecosystem Science and Policy, Geology, Marine Science, Math, or Physics (of which at least 6 must be at the 200 level or higher). The elective courses may be chosen to satisfy degree requirements for a second major or a second minor. For Broadcasting Journalism double majors, the electives may be taken from the School of Communications.

Minor in Meteorology

To obtain a minor in Meteorology students must complete: MSC103, MSC118, MSC220, MSC243, MSC303 (or MSC306) or an approved 3 credit elective. Only those courses passed with a grade of “C-“ or higher may be applied to the major or minor.

2. Sample Curriculum for Meteorology Major and Double-Major Options

2.1 Sample Curriculum **Meteorology Major (math minor)**

Freshman Year

Fall		Spring	
MSC103 Intro Atmospheric Sci.	3	MSC118 Weather Topics	1
MTH161 Calculus I	4	MTH162 Calculus II	4
MSC111 Intro Marine Sci.	3	Elective	4
ENG105	3	ENG106	3
SSC	3	HUM	3
Total	16	Total	15

Sophomore Year

Fall		Spring	
MSC243 Weather Forecasting	2	MSC303 Meteorol. Instrument.	3
MTH210 Vector and Matrices	3	CHM111/113 Princ of Chemistry	4
PHY205 Univ Physics I	3	PHY206/208 Univ Physics II	4
Elective	3	HUM	3
HUM	3		
Total	14	Total	14

Junior Year

Fall		Spring	
MSC305 Atmos. Thermodynamics	3	MSC405 Atmos. Dynamics I	3
MTH310 Multivariate Calculus	3	MTH311/320	3
PHY207 Univ Physics III	3	Elective	3-4
Elective	3-4	SSC	3
LAN	3	LAN	3
Total	15+	Total	15+

Senior Year

Fall		Spring	
MSC406 Atmos. Dynamics II	3	MSC409 Physical Meteorol.	3
MSC407 Weather Analysis	4	CSC120	4
MTH224 Intro. to Prob. Statistics	3	Elective	3
LAN	3	HUM	3
SSC	3	SSC	3
Total	16	Total	16

Total: 121-123 credits

Science Electives: 15+ additional credits hours of which at least 12 must be from Biology, Chemistry, Computer Science, Ecosystem Science and Policy, Geology, Marine Science, Math, or Physics; and of which at least 6 must be at the 200 level or higher.

2.2 Sample Curriculum **Meteorology Major (math minor)/ Marine Science Major**

Freshman Year

Fall

Spring

MSC103 Intro Atmospheric Sci.	3	MSC118 Weather Topics	1
MTH161 Calculus I	4	MTH162 Calculus II	4
MSC111 Intro Marine Sci.	3	GSC110/114 The Earth System	5
ENG105	3	ENG106	3
SSC	3	HUM	3
Total	16	Total	16

Sophomore Year

Fall

Spring

MSC243 Weather Forecasting	3	MSC303 Meteorol. Instrument.	3
MTH210 Vector and Matrices	3	PHY206/208 Univ Physics II	4
PHY205 Univ Physics I	3	CHM111/113 Princ of Chemistry I	4
BIL150 General Biology	4		
HUM	3	HUM	3
Total	16	Total	14

Junior Year

Fall

Spring

MSC305 Atmos. Thermodynamics	3	MSC405 Atmos. Dynamics I	3
MTH310 Multivariate Calculus	3	MTH224/311/320	3
PHY207 Univ Physics III	3	MSC215/216 Chem Oceanography	4
CHM112/114 Princ of Chemistry II	4	SSC	3
LAN	3	LAN	3
Total	16	Total	16

Senior Year

Fall

Spring

MSC406 Atmos. Dynamics II	3	MSC409 Physical Meteorol.	3
MSC407 Weather Analysis	4	CSC120	4
MSC230/232 Intro Marine Biology	4	MSC301 Physical Oceanography	3
LAN	3	HUM	3
SSC	3	SSC	3
Total	17	Total	16

Total: 127credits

2.3 Sample Curriculum **Meteorology Major /Math Major**

Freshman Year

Fall		Spring	
MSC103 Intro Atmospheric Sci.	3	MSC118 Weather Topics	1
MSC111 Intro Marine Sci.	3	Elective	4
MTH161 Calculus I	4	MTH162 Calculus II	4
ENG105	3	ENG106	3
SSC	3	HUM	3
Total	16	Total	15

Sophomore Year

Fall		Spring	
MSC243 Weather Forecasting	3	MSC303 Meteorol. Instrument.	3
MTH210 Vector and Matrices	3	CHM111/113 Princ of Chemistry	4
PHY205 Univ Physics I	3	PHY206/208 Univ Physics II	4
MTH310 Multivariate Calculus	3	HUM	3
SSC	3		
Total	15	Total	14

Junior Year

Fall		Spring	
MSC305 Atmos. Thermodynamics	3	CSC120	4
PHY207 Univ Physics III	3	MSC405 Atmos. Dynamics I	3
MTH320 Intro Numerical Analysis	3	MTH311 Ordinary Diff. Equations	3
Elective	3	SSC	3
LAN	3	LAN	3
Total	15	Total	16

Senior Year

Fall		Spring	
MSC406 Atmos. Dynamics II	3	MSC409 Physical Meteorol.	3
MSC407 Weather Analysis	4	MTH514 Partial Diff. Equations II	3
MTH513 Partial Diff. Equations I	3	MTH224 Statistics	3
LAN	3	HUM	3
HUM	3	SSC	3
Total	16	Total	15

Total: 122 credits

2.4 Sample Curriculum **Meteorology Major (math minor) /Ecosystem Science Policy**

Freshman Year

Fall

Spring

MSC103 Intro Atmospheric Sci.	3	MSC118 Weather Topics	1
MSC111 Intro to Marine Science	3	MTH161 Calculus I	4
GSC110/114 The Earth System	5	ECS112 Problems in ECS	2
ECS111 Intro Earth's Ecosystem	3	HUM	3
ENG105	3	ENG106	3
		LAN	3
Total	17	Total	16

Sophomore Year

Fall

Spring

MSC243 Weather Forecasting	3	MSC303 Meteorol. Instrument.	3
MTH162 Calculus II	4	PHY206/208 University Physics II	4
PHY205 University Physics I	3	BIL103 Humans & Environment	3
MTH210 Vector and Matrices	3	SSC	3
ECS201 Seminar Environ Issues I	1	ECS202 Seminar Environ Issues II	1
LAN	3	LAN	3
Total	17	Total	17

Junior Year

Fall

Spring

MSC305 Atmos. Thermodynamics	3	MSC405 Atmospheric Dynamics I	3
MTH310 Multivariate Calculus	3	CSC120	4
PHY207 University Physics III	3		
ECS301 Env Decision Making I	3	ECS302 Env Decision Making II	3
SSC(POL/ECO211)	3	SSC(POL/ECO212)	3
HUM	3	HUM	3
Total	18	Total	16

Senior Year

Fall

Spring

MSC407 Weather Analysis	4	MSC409 Physical Meteorology	3
CHM111/113 Princ of Chemistry I	4	CHM112 Prin of Chemistry II	3
ECS402 Thesis	3	ECS403 Capstone	3
HUM (PHI330)	3	CAE240	3
SSC (300+)	3	MTH210 224/311/320	3
Total	17	Total	15

Total: 133 credits

2.5 Sample Curriculum **Meteorology (math minor) /Broadcasting Journalism Major**

Freshman Year

Fall

Spring

COM101 Mass Media Comm.	3	MSC118 Weather Topics	1
COM110 Comm. Theory	3	MTH162 Calculus II	4
MTH161 Calculus I	4	CNJ111 Intro News Media Writing	3
HUM	3	CBR102 Intro Broadcasting Cable	3
ENG105	3	ENG106	3
Total	16	Total	14

Sophomore Year

Fall

Spring

MSC103 Intro Atmospheric Sci.	3	MSC303 Meteorol. Instrument.	3
MSC243 Weather Forecasting	3	CSC120	4
PHY205 University Physics I	3	PHY206/208 University Physics II	4
COM250 Freedom Expr. & Ethics	3	MTH210 Vector and Matrices	3
SSC(POL211)	3	SSC (POL/HIS/ECO)	3
HUM	3		
Total	18	Total	17

Junior Year

Fall

Spring

MSC305 Atmos. Thermodynamics	3	CHM111/113 Princ of Chemistry I	4
MTH310 Multivariate Calculus	3	MSC405 Atmospheric Dynamics I	3
MTH224 or MTH311	3	MSC306 Broadcast Meteorology	3
CNJ216 News Reporting & Writing	3	CBR245 Intro Elec Media Produc.	3
HUM	3	CBR301 Measurement & Analysis	3
Total	15	Total	16

Senior Year

Fall

Spring

MSC406 Atmospheric Dynamics II	3	MSC409 Physical Meteorology	3
MSC407 Weather Analysis	4	CBR302 Social Control of Media	3
CBR317 Broadcast Journalism	3	CMR417 Adv Broadcast Journal.	3
CBR elective (300+)	3	CBR elective (300+)	3
MSC111 Intro Marine Science	3	HUM	3
Total	16	Total	15

Total: 127 Credits



MARINE SCIENCE COURSE DESCRIPTIONS

(PLEASE NOTE – THE SEMESTER(S) IN WHICH A COURSE IS OFFERED IS SUBJECT TO CHANGE)

101 Survey of Oceanography (3 cr) *Offered Fall and Spring Semesters*

Introduction to the oceans and their significance to mankind, encompassing geological, physical, chemical, and biological processes; man's role in and on the sea, including fisheries, pollution, and ocean management. Not for major or minor.

102 Introduction to Weather and Climate (3 cr) *Offered Fall and Spring Semesters*

Structure, physics, dynamics and thermodynamics of the atmosphere; weather phenomena weather forecasting, climate and climate change. Contemporary topics covered in this class include global warming, the ozone hole, hurricanes and El Nino. Not for major or minor.

103 Survey of Modern Meteorology (3 cr) *Offered Fall Semester*

Dynamics and thermodynamics of the atmosphere as they relate to contemporary issues in meteorology. Overview of numerical weather prediction techniques and new technologies for monitoring weather and climate. Prerequisite : MTH 108 Open to majors or minors with permission of instructor.

104 Current Issues in Atmospheric Chemistry (3 cr) *Offered Fall Semester*

Topics include: basic composition and chemistry of the atmosphere; chemical processes involved in regional air pollution and acid rain; health effects of air pollution; global change in the composition and climate of the atmosphere; stratospheric ozone, and global warming. The treatment will only utilize basic pre-calculus mathematics and high-school level chemistry. Prerequisite: Pre-calculus math, high school chemistry or permission from instructor.

106 Hurricanes and Society (3 cr) *Offered Spring Semester*

An interdisciplinary course on the meteorology of hurricanes, a review of historically-significant storms, forecasting methods, and the societal and economic impact of the storms. Prerequisite: MSC 102 OR MSC 103

111 Introduction to Marine Science (3 cr) *Offered Fall Semester*

Geological, physical, chemical and biological processes of the world's oceans; the role of the oceans in global dynamics and ocean management. Field trips included.

118 Current Weather Topics (1 cr) *Offered Spring Semester*

Weather and climate-related phenomena such as hurricanes, severe storms, global warming, and acid rain.

120 Topics in Broadcast Meteorology (1 cr) *Offered Fall Semester*

Broadcast Meteorology, including the production of weather briefings and weather news for TV, radio and print media. Prerequisite: MSC103 and MSC118; or permission of instructor

201 Research Diving Techniques (2 cr) *Offered Fall and Spring Semesters*

Trains students to use SCUBA as a scientific tool. Students successfully passing this class will have met the national science diving standards. Prerequisite: Previous certification from a nationally recognized recreational agency, pass a diving physical exam, pass a swim test and obtain D.A.N. insurance.

204 Environmental Statistics (3 cr) *Offered Fall & Spring Semester*

This introductory course provides an overview of parametric and nonparametric statistics with an emphasis on applications in the analysis of environmental data.

Prerequisite: MTH 103 or higher, plus 6 credits in MSC.

215 Chemical Oceanography (3 cr) *Offered Spring Semester*

An introduction to the chemistry of the oceans; descriptive chemical oceanography of the components of ocean waters (metals, gases, organic compounds and nutrients); biogeochemical cycles in oceanic systems. Prerequisite: CHM 112

216 Chemical Oceanography Laboratory (1 cr) *Offered Spring Semester*

Chemical and physical methods in chemical oceanography; analytical and instrumental techniques used to determine density, salinity, chlorinity, dissolved oxygen, nutrients and components of the carbonate system. Corequisite: MSC 215

220 Global Climate Change (3cr) *Offered Fall Semester*

The Earth's climate and the role of natural and anthropogenic processes in shaping climate change. Prerequisite, MSC 103, GSC 110 or GEG 120.

230 Introduction to Marine Biology (3 cr) *Offered Fall Semester*

The sea as an environment; marine life, its special problems and adaptations; emphasis on Caribbean organisms. Identical to BIL 230. Prerequisite: One semester of biology and chemistry with laboratories. Corequisite: MSC 232

232 Marine Biology Laboratory (1 cr) *Offered Fall Semester*

Experimental laboratory exploring ecology, physiology and behavior of marine organisms in South Florida marine habitats; exercises cover laboratory techniques in behavior, functional morphology, productivity, fisheries research, osmoregulation and community ecology. Prerequisite: One semester of biology and chemistry with laboratories. Corequisite: MSC 230

243 Weather Forecasting (3 cr) *Offered Fall Semester*

Application of physical principles to weather forecasting; use and interpretation of computer-generated forecast guidance products of the U.S. Weather Service. Prerequisite: MSC 103; MTH 108

300 Water Resources: History, Management, and Policy – China & Vietnam (3 cr)

This course is intended to develop an overview of the issues and problems surrounding the management of aquatic resources in the broadest sense including water quality of natural waters, drinking water, water pollution, water quantity and supply issues, watershed management, wetland protection, and coastal management. We will explore the available strategies to wisely manage the various aquatic resources, policy options and their socio-economic aspects, legal frameworks, and institutional arrangements. The examples and cases discussed in the course will largely come from China, Vietnam, and the US.

301 Introduction to Physical Oceanography (3 cr)

Application of the laws of physics to the study of the properties and circulation of the world's oceans and atmosphere. Prerequisite: Phy 101 or 205

303 Meteorological Instrumentation (3 cr) *Offered Spring Semester*

Techniques for measuring meteorological variables at the ground and in the free atmosphere. Prerequisite: MSC 103; PHY 101 or 205

305 Atmospheric Thermodynamics (3 cr) *Offered Fall Semester*

Equation of state; water vapor and moist air thermodynamics; phase changes and latent heat; buoyancy and atmospheric convection; thermodynamic diagrams. Prerequisite: MSC 103; PHY 205; Corequisite MATH. 310

306 Advanced Principles in Broadcast Meteorology (3 cr) *Offered Spring Semester*

Broadcast meteorology including the production of professional weather briefings and weather news for on camera delivery. Emphasis on accurately communicating complex meteorological concepts, use of computer graphics, and on-camera delivery. Prerequisite: MSC120 or permission of instructor

307 Introduction to the physics of climate (3 cr) *Offered Spring Semester*

The physical mechanisms which govern the earth's climate and climate variability. Prerequisite: MSC 305

310 Living Resources of the Ocean (3 cr) *Offered Spring Semester*

Biology of marine fish and shellfish of major economic interest, techniques of harvesting, and resource management. Prerequisite: MSC 230

313 Coastal Law (3 cr) *Offered Fall Semester*

Basic doctrines and public policy related to the use and regulation of the United States coastal zone and seabed. Prerequisite: junior standing

314 Ocean Law (3 cr) *Offered Spring Semester*

The principles of international ocean law regarding ocean management; ocean delimitation and issues of environmental ocean regulation within an international legal framework. Prerequisite: junior standing

315 Marine Biota and Biogeochemical Cycles (3 cr) *Offered Fall Semester*

The distribution of dissolved and particulate materials in the sea is not uniform in time and space. This variability reflects the diverse sources, transformations, and sinks of chemical constituents in the sea. This course provides students with an introduction to marine biogeochemistry stressing the role of marine organisms. The first half of the course concentrates on the marine carbon cycle and its interaction with the terrestrial biosphere and atmosphere. Thereafter, biogeochemical cycles are described for biogenic particulate material, the major nutrients, and trace elements, principles of international ocean law regarding ocean management; ocean delimitation and issues of environmental ocean regulation within an international legal framework. Prerequisite: junior standing

316 Global Primary Production (3 cr) *Offered By Announcement Only*

Photosynthesis supports the vast majority of life on planet earth. Although terrestrial and aquatic photoautotrophs share the same basic photosynthetic mechanism, it is clear that the physical environment and the fate of primary production differ drastically on land and in the sea. This course reviews the magnitude and the processes that shape primary production in terrestrial, oceanic, and freshwater habitats. It includes the fate of primary production in the earth's biomes, and the role of terrestrial and aquatic productivity in regulating, and responding to, variable climate. Prerequisite: BIL 160

320 Field Oceanography (4 cr) *Offered Fall Semester*

A variety of oceanographic settings will be studied using physical, chemical, geological and biological oceanographic techniques. Prerequisite: Six credits in Marine Science and the permission of instructor.

321 Scientific Programming in the Atmospheric Sciences (3 cr) *Offered Spring Semester*

An introduction to scientific programming in a Linux environment using the FORTRAN 90/95 language with specific applications to meteorology. Prerequisite (MSC 103 or CSC 120) MTH 162 and MTH 210.

325 Biological Oceanographic Techniques (3 cr) *Offered By Announcement Only*

Methodology of use to biological oceanographers. Field sampling of plankton biomass and productivity, benthic biomass, and selected physical parameters. Applications of modular techniques and remote sensing to oceanographic problems. (Selected readings) Prerequisite: MSC 230

326 Marine Genomics (3 cr) *Spring Semester*

Intensive lecture/laboratory course with emphasis on using genomic tools to address an independent research project of importance in the marine sciences. Prerequisite: BIL 250

340 Ocean Policy (3 cr) *Offered Fall Semester*

Analysis of ocean policy issues in US fisheries, marine conservation and marine protected areas, marine pollution, coastal management and regulation of offshore oil and gas activities.

345 Economics of Natural Resources and the Environment (3 cr) *Offered Spring Semester*

A comprehensive overview of the economics of national, international, and global environmental problems. A unifying theme throughout is sustainable development, defined as "maximizing the net benefits of economic development while maintaining the services and quality of natural resources over time". Economic reasoning is used to examine causes and consequences of environmental and resource problems, and measures for dealing with them.

350 Survey of Marine Mammals (3 cr) *Offered Spring Semester*

The evolution and ecology of the cetaceans, pinnipeds, manatees and allies. The natural history, zoogeography, physiology, husbandry, and biochemical aspects of each species are emphasized. Prerequisites: MSC 230.

364 Life in Moving Fluids (3 cr) *Offered Fall Semester*

The physical characteristics of air and water are described in relation to various flow phenomena that play a part in life functions. Adaptations of form and function reflect the very different properties of the media (air and water) of terrestrial and aquatic life. Energy conversion and transfer limit form and function and enable a wide variety of survival strategies. Prerequisite: PHY 101, MSC 230, or BIL 265

371 Readings in Marine Science (1-2 cr) *Offered Fall and Spring Semesters*

Library research with faculty supervision; bibliography to be submitted in preparation for laboratory and/or field research project.

400 Water Quality Assessment and Environmental Forensics -China & Vietnam (3cr)
Offered Summer Semester

This course is intended to provide the scientific basis for understanding water quality issues and how water pollution can adversely affect the health of humans and ecosystems. Following basic introduction to the scientific concepts we will investigate numerous case studies using a forensic approach to unravel the mystery surrounding "how, why, and who" was responsible for specific water pollution cases that caused adverse human and/or ecological health effects. The course will have a capstone research project that will involve both laboratory and field investigations into a specific pollution problem.

402 Introduction to Atmospheric Modeling (4 cr) *Offered Fall Semester*

Basic equations for physical and chemical processes in the atmosphere, with emphasis on the solution of photochemical "box" models with multiple constituents, aerosol models, aqueous chemistry models, and multi-box models of biogeochemical cycling. Numerical approximations for the solution of the relevant differential equations. Analysis of implications and limitations of model results, and comparison of observations. The course includes a computer lab to run diverse models. Prerequisite: MSC 103, 104, 241 and 305. MTH 161, 162, 210 and 311. CHM 364. MTH 312.

405 Atmospheric Dynamics I (3 cr) *Offered Spring Semester*

Derivation and scaling of the equations of atmospheric motion; hydrostatic and geostrophic balance; circulation and vorticity. Prerequisite: MSC 305. Prerequisite or corequisite: MTH 513.

406 Atmospheric Dynamics II (3 cr) *Offered Fall Semester*

Baroclinic and barotropic instability; boundary layer dynamics; mathematical principles of numerical weather prediction; maintenance of the general circulation. Prerequisite: MSC 405.

407 Weather Analysis (3 cr) *Offered Fall Semester*

Three-dimensional analysis of synoptic-scale weather systems; application of the fundamental laws of atmospheric dynamics to observed weather patterns; practical questions of worldwide data exchange and display. Prerequisite: MSC 305.

408 Tropical Meteorology (3 cr) *Offered Fall Semester*

Structure and behavior of the tropical atmosphere; wave perturbations of the Trades and the Inter-Tropical Convergence Zone; structure and dynamics of tropical cyclones; interaction between cloud- and synoptic-scale motions; air-sea interaction. Prerequisite: MSC 305.

409 Physical Meteorology (3 cr) *Offered Spring Semester*

Atmospheric radiation; absorption and scattering principles of remote sensing of the atmosphere; cloud microphysics; nucleation, coalescence, ice crystal growth, atmospheric electricity and lightning. Prerequisite: MSC 305.

410 Marine Conservation (3 cr) *Offered Fall Semester*

An advanced undergraduate course in conservation science with case studies and field work; it is designed to cover marine ecology and the science information needs of tropical marine parks and protected areas with a focus on the particular threats to Caribbean protected areas; Prerequisite: Permission of instructor.

411 Projects in Marine Science (1-3 cr) *Offered Fall and Spring Semesters*

Individual, independent research with faculty supervision. A formal written report is required. Prerequisite: MSC 371, and permission of the coordinator during the semester preceding registration.

415 Coral Reef Management (3 cr) *Offered Spring Semester*

This interdisciplinary course examines the nature of coral reef science and management; biological, environmental, ecological and socioeconomic aspects of coral reef science, coral reef management problems and approaches at local to global scales, and the implications of climate change for coral reef science and management. Prerequisite: MSC 230

416 Environmental Analysis (3 cr) *Offered Fall Semester*

A laboratory course using the Environmental Protection Agency's methods of sampling, sample preparation and analysis for priority pollutants; methods of ultra-micro chemical analysis, Quality Assurance and Quality Control. Prerequisite: CHM 203

460 Spatial Applications in Marine Science (3 cr) *Offered Fall and Spring Semesters*

The concepts and marine applications of Geographic Information Systems. Every class period will entail short class lectures and hands on computer based GIS exercise on marine science related issues. Students will learn how to use ArcGIS 9.2 and create simple GIS models primarily using vector data.

466 Environmental Physiology: Oxygen, Water and Ionoregulatory Stress (2 cr) *Fall Semester*

This is an intensive laboratory course that combines and elaborates on concepts learned in BIL 265. Topics will include homeostasis, interactions with the external environment, and life with limited oxygen and water. Lectures will be highly discussion-based; students will be expected to read primary research articles as suggested by the professor before lecture to foster participation in those discussions and form hypotheses about accompanying laboratory. Each lab will be written up as a formal laboratory report (i.e., Introduction, Materials and Methods, Results and Discussion).

Prerequisite: BIL 265 and permission of instructor.

490-491 Special Studies in Marine Science (1-3 cr) *Offered Fall and Spring Semesters*

Interdisciplinary capstone course in Marine Science. Content of the course will vary by semester to include courses such as The Galapagos Islands Course. Content in any semester will be expressed in parentheses following "Special Studies" in the class schedule. Prerequisite: Junior or senior standing and permission of instructor.

UGalapagos

420 Political Ecology of the Galapagos (3 cr)

This field course in the Galapagos National Park offers a rare chance to examine the human interactions in this highly politicized landscape of conservation. Students practice the political ecology approach for doing ethnographic fieldwork and explore how it can lead to wiser resource management. PREREQUISITE: PERMISSION OF INSTRUCTOR



421 Terrestrial Biology and Adaptations of the Galapagos. (3 cr)

This course will examine the terrestrial plant and animal life of Isabela Island, discuss the biology and how it adapted to life on Isabela. Through field and laboratory exercises we will explore the power of organisms' DNA in shaping life into unique forms like those famously present in today's Galapagos.

PREREQUISITE: BIL 160 AND PERMISSION OF INSTRUCTOR.

422 Marine Ecology of the Galapagos (3 cr)

This course focus on marine ecosystems of the Galapagos, emphasizing near-shore environments. Topics will include how the unique location and oceanography of the Galapagos have shaped the species composition of resident and migrant marine animals. The role of genetic drift, local habitat characteristics and natural selection on marine ecosystems will be examined. This is a field intensive course with time spent in intertidal, near-shore and off-shore island environments.

PREREQUISITE: BIL 160 OR MSC 230 AND PERMISSION OF INSTRUCTOR

423 Oceanography, Climatology and Conservation Biology of the Galapagos. (3 cr)

The Galapagos are located in a uniquely productive area of the sea, which has allowed the development of a rich and unique marine biota. The first week of the course will carry the students through the dynamic, climatic, and oceanographic circumstances that determine the unique character of the Galapagos. The second week will cover scientific evaluation of the threats to the marine biodiversity of the Galapagos, focusing on sharks, penguins, sea turtles and other at-risk species and habitats.

PREREQUISITE: BIL 160 OR MSC 230 AND PERMISSION OF INSTRUCTOR.

424 Origin and Geology of the Galapagos Islands. (3 cr)

This course will explore the origin and geology of volcanic oceanic islands, using the Galapagos Islands as a natural laboratory. Though all share a common origin in plate tectonic theory, each island presents a host of environments that originate in the processes of volcanic action, erosion and hydrology. Individual islands therefore develop distinctive ecosystems within which organisms interact and evolve. The emphasis of this course will be to lay out the underlying geological processes that have led to the formation of the islands and to their present state, and then to explore the ways the physical environment has influenced adaptation and biodiversity.

PREREQUISITE: GSC 110 AND PERMISSION OF INSTRUCTOR.

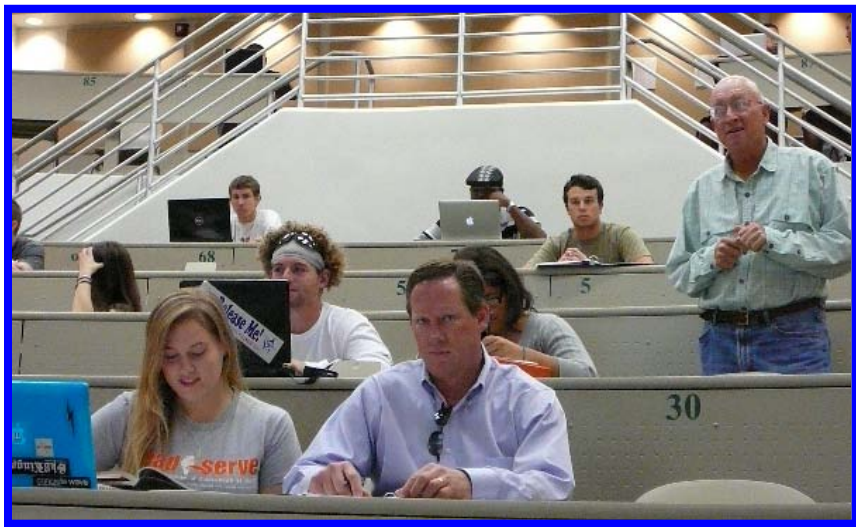
Honors in Marine and Atmospheric Science

The honors in Marine and Atmospheric Science Program gives you an opportunity to do original research in an area of your choice, working closely with a faculty member.

Requirements for admission are:

- * Sophomore status
- * Completion of at least 2 semesters of science laboratory or calculus courses, and
- * An overall GPA of at least 3.3

In addition to the requirements for the Bachelor of Science in Marine and Atmospheric Science or Bachelor of Arts in Marine Affairs degree, a student must select a three member faculty thesis committee, complete six credits of independent research, and present a poster of the research at the UM Research and Creativity Forum. To graduate with “Departmental Honors in Marine and Atmospheric Science”, have a final G.P.A. of 3.5 in Marine Science, Meteorology or Marine Affairs and 3.3 overall, and have your senior thesis reviewed and accepted by your faculty committee.



Study Abroad

Study abroad affiliations with universities in Australia, Britain, Spain, the Galapagos Islands and the Canary Islands allow students to explore marine issues and communities in a variety of physical and political contexts and to network with fellow marine science students from around the world.

Murdoch University in Perth has been added to the choices in Australia together with James Cook University, the University of Wollongong, and Flinders University. Students may apply scholarships and financial aid to study abroad programs. Preliminary applications should be made in the spring of the freshman year to ensure that curricular requirements are met.

Student Activities



Marine Science students complement classroom study with active participation in marine related clubs and organizations.

Aquarium Club - The club maintains the coral culture tanks in the MSC laboratory, and works with coral and invertebrate culture projects in the field, and on the RSMAS campus.

SCUBA Club - The scuba club is open to students across the campus and is one of the most active student organizations. Members must be certified divers before joining. The club meets weekly for speakers and trips.

RhoRhoRho is the marine and atmospheric honor society. Students with a 3.0 average who have made a significant contribution to environmental awareness and scholarship are invited to join.

Marine Mammal Stranding Network - This student organized network works with the National Marine Fisheries Service to respond to marine mammal strandings in South Florida. The club organizes training for members in photo identification, anatomy, physiology, ecology and pathology.

Propeller Club - The student chapter of the Propeller Club is sponsored by the cruise line, shipping and business interests at the port of Miami. Students network with industry personnel and address projects and concerns of the local shipping community.

The Atmospheric Club participates in the National Forecasting Contest, visits weather laboratories and operates their own weather station. Club members also participate in atmospheric research and present at local and national meetings.

Earth Alert - Open to students across campus, Earth Alert members think globally and act locally to improve the environment on and off campus. The club is very active in promoting recycling, highway and beach cleanups, and environmental education.

**FACULTY OF THE UNDERGRADUATE
MARINE AND ATMOSPHERIC SCIENCE PROGRAM**

Assistant Dean / Professor

William M. Drennan, Ph. D.
University of Waterloo
Applied Marine Physics; Air-sea Interaction; Physical Oceanography

Director, Marine Science Program

Daniel DiResta, Ph.D.
University of Miami
Marine benthic community ecology

Associate Director

Donald Olson, Ph.D.
Texas A&M University
Ocean circulation dynamics, mesoscale phenomena, ecosystem dynamics

Academic Advisor / Lecturer

Jill Richardson, Ph.D.
University of Miami
Coral biology, ecology, pathology

Academic Advisor / Lecturer

Maria E. Villanueva, MBA, M.A. in Marine Affairs
University of Miami
Marine resource allocation and policy

Coordinator for Meteorology

Paquita Zuidema, Ph.D.
University of Colorado at Boulder
Global climate change, hydrology, remote sensing

Academic Advisor / Professor

Gary Hitchcock, Ph.D.
University of Rhode Island
Phytoplankton physiological ecology

Academic Advisor / Professor

Larry Peterson, Ph.D.
Brown University
Paleoclimatology and global change

Academic Advisor

M. Danielle McDonald, Ph.D.
McMaster University, Hamilton, Ontario, CANADA
Animal physiology, molecular biology, pharmacology and toxicology

Teaching Faculty

Bruce Albrecht, Ph.D.
Colorado State University
Role of clouds in the atmosphere

Elizabeth Babcock, Ph.D.
University of Washington
Marine Conservation Biology

Andrew Bakun, Ph. D.
Oregon State University
Fisheries Biology

Shuyi Chen, Ph.D.
Pennsylvania State University
Mesoscale and tropical meteorology

Amy Clement, Ph.D.
Columbia University
Climate modeling, paleoclimate

Robert Cowan, Ph.D.
Scripps Institution of Oceanography
Ichthyology

Harry DeFerrari, Ph.D.
Catholic University
Underwater acoustics, signal processing

Lynne Fieber, Ph.D.
University of Miami
Neurophysiology

Rana Fine, Ph.D.
University of Miami
Chemical oceanography and tracers

John Gifford, Ph.D.
University of Minnesota
Marine archaeology

Peter W. Glynn, Ph.D.
Stanford University
Coral reef biology/ecology

James D. Happell, Ph.D.
Florida State University
Chemical oceanography, geochemistry

Christopher Harrison, D.Sc
Cambridge University
Geophysics, plate tectonics

Anthony J. Hynes, Ph.D.
University of Leeds
Atmospheric Chemistry, laser spectroscopy

Mohamed Iskandarani, Ph.D.
Cornell University
numerical methods, ocean flow simulation

David C. Kadko, Ph.D.
Columbia University
Geochemical processes

Igor Kamenkovich, Ph.D.
MIT/Woods Hole Oceanographic
ocean dynamics, large-scale ocean circulation

Ben Kirtman, Ph.D.
University of Maryland
El Niño prediction, dynamics and variations

Chris Langdon, Ph.D.
University of Rhode Island
Coral and algae primary production, coral reefs

Kevin Leaman, Ph.D.
MIT/Woods Hole Oceanographic
Current profiling techniques

David Letson, Ph.D.
University of Texas at Austin
Natural resource economics

Sharanya J. Majumdar, Ph. D.
Cambridge University
Numerical forecasting

Brian Mapes, Ph.D.
University of Washington
Atmospheric convection and climate

John McManus, Ph.D.
University of Rhode Island
Coral Reef Management

Liana McManus, Ph.D.
University of Rhode Island
Fisheries and resource management

Sarah Meltzoff, Ph.D.
Columbia University
Coastal cultures, political ecology

Frank Millero, Ph.D.
Carnegie-Mellon University
Physical chemistry, chemical oceanography

Fernando Moreno, Ph.D., J.D., LL.M.
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Harvard University
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University of Miami
Stromatolite geology

Rick Riera-Gomez
RSMAS Diving Safety Officer
Scientific Diving

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University of Miami
Fish pathology and immunology

Brian Soden, Ph.D.
University of Chicago
Global climate change, climate modeling

Daniel Suman, Ph.D., J.D.
Scripps Institution of Oceanography,
Law School, University of California Berkeley
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Peter Swart, Ph.D.
University of London-King College
Geochemistry

John Van Leer, D.Sc.
Woods Hole Oceanographic Institution/MIT
Marine instrumentation, ocean dynamics

Harold Wanless, Ph.D.
Johns Hopkins University
Marine sedimentation processes

Jorge Willemsen, Ph.D.
University of Chicago
Applied marine physics

Chidong Zhang, Ph.D.
Pennsylvania State University
Meteorology