

MET 4532 HURRICANES (ID: U01 86964, REV)

FLORIDA INTERNATIONAL UNIVERSITY

Fall 2017

Instructor: Dr. Hugh Willoughby, Office: AHC5 363. Phone: 305-348-0243. Email: hugh.willoughby@fiu.edu. **Note: Details of topics covered and assessments may change during the course of the term.**

Time and location: 11:00-11:50, MWF, AHC5 357

Office Hours: Mon 10:00-11:00 AM, Tue, 1:00-2:00 PM, Wed 2:00-3:00 PM, or by appointment.

Prerequisites: None in the formal sense, but you should have taken a college-level physical or environmental science.

Text: K. A. Emanuel, *Divine Wind*, Oxford University Press, 296 pp, 2005, ISBN-13:978-0-19-514941-8. E-book edition is OK. The bookstore should have copies. If not let me know.

Reference: Williams, Jack, and Bob Sheets: *Hurricane Watch: Forecasting the Deadliest Storms on Earth*, Vintage 1st Edition, 352 pp, 2001 ISBN-0-375-70390-X. This book is going out of print and is not required. Nonetheless, it contains a lot of great information if you can find a copy.

You can reach an on-line version of this syllabus at:

http://faculty.fiu.edu/~willough/met_4532/0_Syllabus.pdf

And links to course materials and notes:

http://faculty.fiu.edu/~willough/met_4532/0_LINKS.html

Course description: Hurricane history, formation, structure, motion, and impacts for undergraduates and beginning graduate students in engineering, physical sciences or social sciences.

Course Goals and Objectives: This course covers the history and science of hurricanes. We will follow the texts' focus on hurricane history and meteorology, and I will introduce material on hurricanes as natural disasters, including their human and economic impacts.

Course organization and philosophy: I hope and expect that you are self-selected for motivation and interest in tropical cyclones. The class is small enough for substantial interaction and individual attention. Make a genuine effort, and you should do well.

The text is a popular account of hurricane history and lore. Though lavishly produced, it contains a great deal of cutting-edge science, some excellent art, and much of the significant history. As a reference, *Sheets and Williams* is more prosaic and more focused on the history, but it also contains a wealth of information. I'll add more physical and social science through the lectures. Please read the assignments before we

cover them in class, and bring the book each time we meet. I welcome thoughtful questions.

I see meteorology as a descriptive natural science that often speaks the language of physics and mathematics. We will use some basic mathematics here, but the main focus will be on essential concepts. Attending the lectures, doing the reading, participating in discussion, and taking careful notes will be keys to success.

Participation and homework	15%
Exam #1	20%
Exam #2	20%
Paper	20%
Final	25%
Total	100%

For the most part this is a lecture and concepts course. There will be occasional homework, two exams, a paper, and a final. Format of the exams will be short answer, short (1-2 paragraphs) essay, and draw-and-label a sketch. I am requiring a 2000-word paper. A good topic might be a “disaster” book report based on the bibliography that I’ll distribute, but I encourage other topics, particularly ones based upon your experiences. Please, no recycled

Grading Scale	
100-90	A
89-80	B
79-70	C
69-60	D
below 60	F

term papers on Hurricane Andrew from other courses or high school. The paper, exams and final will contribute to grades as indicated in the table on the left, and I plan to use a standard 90-80... scale, as shown to the right, for assigning letter grades.

A word about intellectual dishonesty, which I define as claiming someone else’s work or ideas as your own. I won’t tolerate it, and it is a certain way to have a bad outcome in MET 4532. I will use Turnitin originality screening software on submitted papers. A paper must pass Turnitin to receive a passing mark. I’ll provide the Turnitin URL, and course access information at the time you select topics. That said, everyone is trustworthy unless proven otherwise.

Topics and reading assignments: Please complete each assignment before class and come prepared to discuss it.

Class	Mon.	Day	Topic	Assignment
1	AUG	21 M	Introduction, <i>Kamikaze</i> , <i>Huracán</i>	E: 1-5, 18-22
2		23 W	Columbus, <i>La Floride</i> & 1780	E: 30-32, 38-39, 63-66
3		25 F	Atmosphere Overview & <i>The Tempest</i>	Notes, E: 49-52
4		28 M	Hurricane Structure	E: 7-16,
5		30 W	19 th Century, Samoa	E: 68-71,82
6	SEP	1 F	Sun and Sea	E: 23-28
		4 M	Labor Day, NO CLASS	
		6 W	Irma, NO CLASS	
		8 F	Irma, NO CLASS	
	SEP	11 M	Irma, No Class	

		13 W	Irma, No Class	
		15 F	Irma, No Class	
7		18 M	Irma and finish Sun & Sea	
8		20 W	Convection	E: 34-36
9		22 F	Trade Winds	E: 41-47
10		25 M	Heat Engines	E: 54-61
11		27* W	Galveston & Early 20th Century	E: 83-91
12		29 F	Intensity	E: 72-81
13	OCT	2 M	Formation	E: 93-101 Paper Topics Due
14		4 W	Motion	E: 125-134
15		6 F	Termination	E: 109-115
16		9 M	<i>Hurricane</i> , Hurricanes of 1926 & '28	E: 103, 104-107, 117-123
17		11 W	Hurricanes of 1935 and 1938	E: 136-144, 155-163
18		13 F	Exam #1 Review	Classes 1-16
19		16 M	Exam #1	
20		18 W	Waves	E: 147-152,
21		20 F	Storm Surge	E: 165-171
22		23 M	1940s, <i>Typhoon</i> & Halsey	E:172-173, 174-180, 181
23		25* W	Rain & Hurricane Mitch	E: 182-192, 53
24		27 F	The 1950s and 1960s	Notes
25		30 M	Hurricane flying	E: 193-202, 213-219
26	NOV	1 W	Hurricane remote sensing	Notes
27		3 F	Project STORMFURY	Notes
28		6 M	Hurricane Forecasting	E: 227-238
29		8 W	Camille & Cyclone of 1970	E: 205-211, 221-225
30		10 F	Veteran's Day, NO CLASS	
31		13 M	Exam #2 Review	Classes 15-23
32		15 W	Exam #2	
33		17 F	Tracy & Andrew	E: 244, 240-250
34		20 M	The seasons from Hell 2004-2005	Notes, Papers To Turnitin
35		22 W	Gustav, Ike...Sandy...Harvey, Irma	Notes
		23-24	Thanksgiving Break, NO CLASS	
36		27 M	Hurricanes and climate	E: 252-261 Papers Due
37		29 W	Human impacts	Notes
38	DEC	1 F	Hurricane disasters	Notes
39		4	Wind engineering	Notes
40		6	Windstorm Insurance	Notes
41		8	Review	Cumulative
		TBA	FINAL EXAM	

*HEW in Tallahassee, Javiera Hernandez guest lecture