ATM Curriculum Proposal

ATM curriculum is strong, but there are several points that have been made by faculty and students over the years that can be addressed.

Current ATM B.S. four-year plan

FALL	SPRING
(UFSP 100)	MAT 113
MAT 112	PHY 150
PHY 140+145	
CHM 115	
ATM 209	ATM 211
ATM 210	ATM 315
MAT 214	MAT 311
(ATM 311)	ATM 317
ATM 316	ATM 321
ATM 320	ATM 350
(ATM 400)	ATM 419

Issue #1: Programming early in curriculum

-Long-time challenge of teaching orthogonal skills in ATM 315 (statistics and introductory programming)

-Prepare students for success in ATM 315 with early exposure to introductory programming

-While ATM 240 has been excellent for students who have taken it over the past few years, there is a question as to who will teach this going forward

Issue #1: Programming early in curriculum

***Proposed solution*:**

-Introduce lab component of ATM 210 with some programming

•Lab is hands-on, data-driven complement to lecture

•Include data collection (handheld weather sensors, weather balloons) and basic data Python data analysis and visualization (e.g., plot NYSM meteograms, plot sounding on linear scale, convert between humidity variables, …)

-Continue to develop programming skills in new two-hour ATM 211 lab (longer than current 55-min discussion)

-Removal of ATM 209 (material is folded into new ATM 211 lab)

Issue #1: Programming early in curriculum

***Challenges*:**

-ATM 210 becomes more involved for faculty teaching the course

-Can give graduate student teaching opportunity with lab (akin to Erin Potter and 106)?

-More material moved into ATM 211, but remains 4 credits

-Hopefully this can be addressed by turning the 55-minute discussion section of ATM 211 into a two-hour lab, but map analysis, intro thermodynamics with Skew-T as relevant for weather analysis/forecasting, and intro programming in a lab may be challenging

Issue #2: Spring freshman year, no ATM classes

***Proposed solution*:**

-Mirror our ENV program's 105/106 requirement spring freshman year

-Move ATM 210 up (earlier) one semester, adding a lab and one credit, only for ATM and CLM majors

-Allows for moving ATM 211 and 311 up (earlier) one semester as well

Challenges:

-ATM 210 may have to be waived for transfers

-This is probably OK; it becomes a "gravy" course, but not necessary for graduation with ATM B.S..

Issue #3: Abrupt transition from sophomore to junior year

Junior year has several rigorous, highly quantitative/theoretical core classes
ATM quantitative/theoretical core could be spread out more for traditional four-year students

***Proposed solution*:**
-ATM 320 is taken one full academic year earlier, in fall sophomore year
-Students get thermodynamics fundamentals earlier in curriculum; can build on this in forecasting class(es)

Challenges:
-2+2 Transfer students will not take ATM 320 second year; it will continue to be taken alongside ATM 316 and potentially ATM 321

Issue #4: NWP currently taught too late for students to use in senior research

***Proposed solution*:**
-Move ATM 419 to fall senior year

Challenges:
-Creates a final semester that is devoid of required ATM courses.
-Future: Perhaps capstone requirement (AMS guidelines)

Proposed ATM B.S. four-year plan

Current

FALL	SPRING
(UFSP 100)	MAT 113
MAT 112	PHY 150
PHY 140+145	
CHM 115	
ATM 209	ATM 211
ATM 210	ATM 315
MAT 214	MAT 311
(ATM 311)	ATM 317
ATM 316	ATM 321
ATM 320	ATM 350
(ATM 400)	ATM 419

Proposed

FALL	SPRING
(UFSP 100)	ATM 210(3)+Lab(1)
MAT 112	MAT 113
PHY 140+145	PHY 150
CHM 115	
ATM 211	(ATM 311)
ATM 320	ATM 315
MAT 214	MAT 311
ATM 316	ATM 317
ATM 321	ATM 350
(ATM 400)	
ATM 419	x

Proposed 2+2-yr transfer plan

4-year-plan

FALL	SPRING
(UFSP 100)	ATM 210(3)+Lab(1)
MAT 112	MAT 113
PHY 140+145	PHY 150
CHM 115	
ATM 211	(ATM 311)
ATM 320	ATM 315
MAT 214	MAT 311
ATM 316	ATM 317
ATM 321	ATM 350
(ATM 400)	
ATM 419	x

Proposed 2+2 transfer plan

FALL	SPRING
ATM 211	ATM 315
ATM 316	ATM 317
ATM 320	ATM 350
	(ATM 311)
ATM 321	x
ATM 419	
(ATM 400)	

Note: In this proposal, **ATM 210** is waived.

Only required courses listed (still need to fill with electives)

Assumes completion of **MAT 214** (+ideally MAT 311)

Remaining issues to be addressed

Further improvements to programming/statistics sequence (changes to ATM 315?)

Further integration of measurements into our curriculum (changes to ATM 327 requirement and/or course?)

-Several peer institutions require instrumentation/measurement (note AMS guidelines