

## NCSU DEPARTMENT OF MATHEMATICS

MA 105 Fall 2019

**MA 105:** Mathematics of Finance

**Course Coordinator:** Molly Fenn ([mafenn2@ncsu.edu](mailto:mafenn2@ncsu.edu))

**Office:** SAS 2108

### **Course Description**

Simple and compound interest, annuities and their application to amortization and sinking fund problems, installment buying, calculation of premiums of life annuities and life insurance.

### **Textbook**

MA 105 is taught using Mathematics of Finance written by Marilyn S. McCollum. Instructors should obtain a copy from Carolyn Gunton in SAS Hall 2109. The free on-line manual for faculty and students is available, contact Molly Fenn and/or Carolyn Gunton to obtain it.

### **Calculators**

All Students in MA 105 must provide their own business calculator. It is recommended that students purchase the HP-10BII business calculator since the course is instructed using that model. Students who choose to use a different calculator are responsible for learning to use it on their own. Students can purchase the calculator for approximately \$30 - \$35 at local stores as well as at the student bookstore. Instructors should go to 2108 SAS Hall for a calculator. Business calculators are used in the classroom beginning in Chapter 3. A videotape on using the HP-10BII is available for faculty and students use in SAS Hall 2105A.

### **Homework**

All homework assignments and lab assignments for MA 105 are submitted through WebAssign. <http://webassign.ncsu.edu> Web-Assign is the only type of homework grading available for MA 105, so any other assignments or quizzes that you choose to give will have to be handled/graded by you. MA 105 instructors unfamiliar with WebAssign should see Seyma Bennett-Shabbir as soon as possible. She can give you an introduction to WebAssign in 15 – 20 minutes.

WebAssign closely follows the lecture notes. All problems have randomized numbers so it is highly unlikely that two students will have the same problem. You should frequently remind students of WebAssign due dates. Also warn them that lack of planning on their part does not constitute an extension of the assignment. It is a serious mistake for students to procrastinate on any assignment because the system might go down at any time. Students should be encouraged to work well AHEAD of the schedule. Instructors may elect the "Self- Extension" policy with penalty. Ask Jennifer George Burt to set WebAssign "self-extensions with penalty". Be sure you understand how this works before you choose this.

WebAssign is purchased online by each student at <http://webassign.ncsu.edu>

Note: Students should be aware that having difficulties with their computer accounts does not exempt them from doing the assignments. Students are responsible for ALL WebAssign and

labs in this course. If a student has difficulties with his/her computer account, he/she is responsible for getting this problem taken care of within a reasonable period of time (I recommend giving them the first week of class) and notifying the instructor of these difficulties so that extensions can be given on assignments if necessary.

### Grades

This course uses standard NCSU letter grading, with no rounding.

$90 \leq A- < 93$	$93 \leq A < 97$	$97 \leq A+ \leq 100$
$80 \leq B- < 83$	$83 \leq B < 87$	$87 \leq B+ < 90$
$70 \leq C- < 73$	$73 \leq C < 77$	$77 \leq C+ < 80$
$60 \leq D- < 63$	$63 \leq D < 67$	$67 \leq D+ < 70$
$0 \leq F < 60$		

The grade distribution below is a suggestion, feel free to modify it for your course.

Grade Component	Weight	Details
WebAssign Homework	20%	Homework will be done through WebAssign and will be due frequently.
In-Class Tests	60%	There will be three in-class tests, each worth 20% of your grade.
Final Exam	20%	The final exam will be given on TBD.

### Academic Integrity

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at <http://policies.ncsu.edu/policy/pol-11-35-01>. The [NCSU Student Code of Conduct](#) covers all work done in this course. Any suspected violations will be promptly reported. Academic dishonesty will result in an automatic failing grade for the course.

### Course Evaluations

A formal evaluation is conducted by the University at the end of the semester and the goal is to achieve 100% class participation in this survey. Online class evaluations will be available for students to complete during the last two weeks of class. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any particular instructor.

### Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Resources Office (<https://dro.dasa.ncsu.edu/>), 919-515-7653. For more information on NC

State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at <http://policies.ncsu.edu/regulation/reg-02-20-01>.

Feel free to use or adapt any of the material below for your class syllabus.

### **Course Website**

We will be using the Moodle learning management system (<http://wolfware.ncsu.edu>) for this course. You will log in using your Unity ID and password. (Refer to online information at <http://oit.ncsu.edu/unityid> or contact (919) 515-HELP or [HELP@ncsu.edu](mailto:HELP@ncsu.edu) for assistance with your Unity ID). After the beginning of the semester, you will see a link to our course site. Once in the site, you can Bookmark or add the site as a Favorite in your web browser so that you can return directly to that page.

### **Course Communications**

Modes of communication in use for this course include email, office hours, and Moodle.

- Moodle discussion forums will be used to facilitate class discussion. Check these forums often and please feel free to reply to your fellow students' posts.
- I will do my best to respond to weekday e-mails and posts within 24 hours. Email messages or posts left after 4 pm Friday will be responded to by Monday evening.
- If you would like to speak with an instructor in person and you can't make it to the posted office hours, please email me to schedule a time that is convenient. Include several time slots that would work for you in your email.

Please be aware that ALL email communications for this course will be sent to your NCSU unity email. If you do not regularly use your ncsu.edu account, there are settings within Gmail that allow you to forward your e-mail to another account. For more information, please see <http://google.ncsu.edu/what-best-way-forward-my-nc-state-gmail-non-nc-state-e-mail-address>

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If you have a question that the whole class may benefit from hearing the answer to, please post on the "Course Content Q&A" forum. I will check this forum often to respond to open questions. You should also check frequently to answer or ask questions.

If you have a question that is very specific to the work you have done (i.e. if you nearly finished your work but got stuck towards the end), you can email your instructor with your question. Including a scan or photo of your work can help. If an instructor receives an email with a question more appropriate to the forum, she may copy and paste the question there without identifying the student who sent it.

### **Make Up Tests**

Should you need to miss an in-class test, a cumulative makeup test will be given during class time in the last week of the semester. Everyone will take the same makeup exam, regardless of which test you missed. The grade for the makeup exam will be used in place of the grade for the test you missed. Details about the makeup test will be sent to students eligible to take it later in the semester. Only students who missed a test are eligible to take the makeup exam.

### **Trans-Inclusive Statement**

In an effort to affirm and respect the identities of transgender students in the classroom and beyond, please contact me if you wish to be referred to using a name and/or pronouns other than what is listed in the student directory.

### **Basic Needs Security**

Any student who faces challenges securing their food or housing or has other severe adverse experiences and believes this may affect their performance in the course is encouraged to notify the professor if you are comfortable in doing so. Alternatively, you can contact the Division of Academic and Student Affairs to learn more about the Pack Essentials program <https://dasa.ncsu.edu/pack-essentials/>

### **Supporting Fellow Students in Distress**

As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom (as well as the campus as a whole) remains a healthy and safe environment for learning. Occasionally, you may come across a classmate whose personal behavior concerns or worries you, either for your classmate's well-being, for your well-being or for the well-being of others. When this is the case, I would encourage you to report the behavior on the link located on NC State's Students of Concern website (<http://go.ncsu.edu/NCSUcares>).

### **List of Policies**

Students are responsible for reviewing the NC State University PRRs (policies, rules and regulations) that pertain to their course rights and responsibilities:

- Equal Opportunity and Non-Discrimination Policy Statement <https://policies.ncsu.edu/policy/pol-04-25-05/> with additional references at <https://oied.ncsu.edu/equity/policies/>
- Code of Student Conduct <https://policies.ncsu.edu/policy/pol-11-35-01/>
- Grades and Grade Point Average <https://policies.ncsu.edu/regulation/reg-02-50-03/>
- Credit-Only Courses <https://policies.ncsu.edu/regulation/reg-02-20-15/>
- Audits <https://policies.ncsu.edu/regulation/reg-02-20-04/>

### MA 105 FALL 2019 SCHEDULE

Please modify this for your class and according to the academic calendar and holidays.

WEEK	TOPICS	LECTURE NOTES	WEBASSIGN
1	Simple Interest Intro, Defns, Time diagrams	Intro, Chpt 1 S1-S3	Intro to WebAssign, Lab1
2	Time Diagrams, Formulas	Chpt 1 S3-S4	SA1
	Decision Making	Chpt 1 S5	SA2
	Time, Dates	Chpt 1 S6-S7	SA3
3	Interest & non-interest bearing notes (Maggie)	Chpt 1 S8-S8.3	SA4
	Equations of value	Chpt 1 S9	SA5
	Partial payments	Chpt 1 S10	SA6, Lab2, SI Rvw
4	Review		
	<b>Test 1: Chapter 1</b>		
5	Bank Discount Intro, Defns, Time diags, Formulas	Chpt 2 S1-S4	SA7
	Loans with Bank Discounts	Chpt 2 S5-S6.1	
	Compound Interest Intro, Defns, Time diags, Formulas	Chpt 3 S1-S4	SA8
6	Graphs of SI vs CI	Chpt 3 S5	
	Working with conversion periods	Chpt 3 S6-S7	SA9
	Business calculator, Effective rates vs. Nominal rates	Chpt 3 S8-S9	Lab3
7	Business calculator, Effective rates vs. Nominal rates	Chpt 3 S8-S9	
	Equations of value	Chpt 3 S10	SA10, Lab4, BD & CI

			Rvw
	Review		
<b>8</b>	<b>Test 2: Chapters 2 &amp; 3</b>		
<b>9</b>	Annuities Intro, Defns, Time Diags, N	Chpt 4 S1-S4	Lab5
	Annuities formulas	Chpt 4 S5	SA11
	Business calculator	Chpt 4 S6	
<b>10</b>	Using the ordinary annuity	Chpt 4 S7	SA12
	Determining N and size of concluding payment	Chpt 4 S7-S8	SA13, Lab6
	Determining N and size of concluding payment	Chpt 4 S8	Lab7
<b>11</b>	General Annuities	Chpt 4 S9	SA14
	General Annuities	Chpt 4 S9	Annuities Rvw
	Review		
<b>12</b>	<b>Test 3: Chapter 4</b>		
	Amortization Intro, Defns, Time Diags	Chpt 5 S1-S2.2	SA15, Lab8
<b>13</b>	Amortization Time Diags	Chpt 5 S2.2	
	Sinking Funds	Chpt 5 S3	SA16, Lab9
	Sinking Funds	Chpt 5 S3	
<b>14</b>	Perpetuities Intro, Defns	Chpt 6 S2-S2.2	SA17
	Solving perpetuities	Chpt 6 S2.3-S2.4	
	Capitalized cost	Chpt 6 S3	SA18
<b>15</b>	Capitalized cost	Chpt 6 S3	Am & SF Rvw
	Review		
	Review		
	<b>Final Exam: Chapters 1-6</b>		