MTH/SLS 218 Syllabus

Mathematics for Elementary School Teachers

With Activities

Text: Beckman, 5th Edition, 2017, Pearson. CSI Math Department 2017. **L Blois**

Required materials include a Calculator, a Compass and a Straight Edge

Day	Section & Reading assignments in the in Text	Activities Practice Problems HW Problems
1a	10.1 Lines and Angles. Angles for intersecting and parallel lines (452)	Activities CA-201/1, 2, 3. CA-202/1, 2; **Practice (text):** 460/1, 3, 4; **HW (text):** 463/2, 4, 5
1b	10.1 Angle sum of a triangle.	Activities CA-203/1, 2, 3. CA-204/1. CA-205/3. CA-206/4, 6, 7. CA-207/1 to 4. **Practice** 461/5, 6, 7. **HW:** 463/9, 10.
2a	10.2 Angles and Phenomena in the world (466)	Activities CA-209: Calculating Earth's Circumference. **Practice** 468/1, 2 **HW:** 469/1ab, 4a-f, 5 (instructor may expand on the topic of seasons)
2b	10.3 Circles & Spheres (472)	**Practice** 475/1, 2, 4. **HW**: 476/1, 2, 3
	10.3 The Global Positioning System (GPS)	Activities CA-214. (GPS can be presented as a class demo with strings and/or with diagrams)
3a	10.4 Triangles, Quadrilaterals and other Polygons: Definitions, Relationships and Venn diagrams (477)	Activities CA-217. CA-218-219. CA-220-221. CA-222 **Practice** 484/1 to 4. **HW:** 487/1, 2, 3, 5abc, 8ab, 9, 16ab, 19a, 20ab
3b	10.6 Constructions with a compass and a straight edge	Activities CA-223/1, 2, 3. CA-224/4, 6, 7. **Practice** 484/5, 6, 7. **HW:** 487/5abc, 8ab, 9, 16ab, 19a, 20ab.
4ab	**4a Review** **4b. Test 1**	
5a	11. Measurement (492) 11.1 Concepts of Measurement (493)	Activities **CA-230/1, 2, 4. CA-231/1, 2, 3.** **Practice** 503/1 to 4, 7, 8, 9. **HW:** 504/1 to 7
	11.2 Length, Area, Volume & Dimension (505)	Activities **CA-232/1, 2.** **Practice** 508/1abc, 2, 3. **HW:** 509/1, 3, 4, 7
	11.3 Error & Precision in Measurement (510)	Activities CA-233/1ab, 2**.** **Practice** 513/1, 2. **HW:** 513/1, 2, 3
5b	11.4 Converting from One Unit of Measurement to Another I (514)	Activities CA-234/1abc, 2. CA-235/1, 2, 3. **Practice** 518/1 to 4. **HW:** 521/1 to 6, 8, 9, 10, 11
	11.4 Converting from One Unit of Measurement to Another II	Activities CA-236/1, 2. CA-237/1 to 5. CA-238/1, 2. **Practice** 518/5, 6, 7. **HW:** 521/12, 13, 14, 16, 17, 21, 25
6a	12.3 Areas of Triangles (535)	Activities **CA-246/3, 4. CA-247/1 to 4** **Practice** 539/2, 4. **HW:** 542/2, 4, 5, 6, 8, 9, 10, 11, 13
6b	12.4 Areas of Parallelograms & Other Polygons (544)	Activities **CA-248/1, 2. CA-249:12H/1, 2;**

		Practice 546/1, 3. **HW:** 547/2, 3, 4abcd, 6, 7ab, 8.
7a	12.5 Shearing: Changing Shapes without Changing Area. Cavalieri's Principle (550).	Activities **CA-250/12J. CA-251/1, 2, 3.** **Practice** 551/1, 2. **HW:** 553/1, 2ab, 3ab, 4ab, 5abc, 6
7b	12.6 Areas of Circles and the Number Pi. (554)	Activities **CA-252:12L. CA-253:12N. CA-254/1.** **Practice** 558/1, 2, 4, 5 **HW:** 559/1, 2, 6, 8
8ab	**8a. Review** **8b. Test 2**	
9a	12.9 Pythagorean Theorem; applications and proofs (570).	Activities **CA-261:12U. CA-262/1 ,4** **Practice** 560/1, 2, 3, 6 **HW:** 563/1, 3, 6.
9b	Include the proof with similar right triangles; and President James Garfield's Trapezoidal proof	
	13. Solid Shapes: Their Volume & Surface Area (580)	
	13.1 Polyhedra & Other Solid Shapes (581)	Activities **CA-265/1, 2; CA-267. Practice** 586/1 to 4. **HW:** 587/2, 3, 4.
10a	13.2 Patterns & Surface Area (589)	Activities **CA-269/13G:1, 2. CA-270/1, 2, 3, 4.** **Practice** 591/7, 8, 9, 10, 11. **HW:** Cylinder Area: 595/3ab, 13ab; Pyramid Area: 596/11, 12. 583/11, 12; Cone Area: 596/15ab, 16ab, 17, 20
10b	13.3 Volumes of Solid Shapes (597) (refer students to YouTube videos)	Activities **CA-275:13N/1, 2, 3. CA-277/2, 3.** **Practice** 603/2 to 7. **HW:** 604/2ab, 4ab, 5, 7, 8, 12ab, cone: (17*, 18ab, 22, 23ab, 24)
	13.4 Volumes of Submerged Objects (607)	Activities **CA-311/1, 2, 3.** **Practice** 608/1, 2ab, 3. **HW:** 609/1, 2, 3
11a	15. Statistics (673). 15.1 Formulating Statistical Questions, Gathering Data, Using Samples (674)	Activities **CA-309/abcde. CA-310/1, 2.** **Practice** 679/1, 2, 3, 4. **HW:** 680/3, 4, 5, 8, 9
	15.2 Displaying Data and Interpreting Data Displays (681)	Activities CA-314/1 to 6. **Practice** 690/1, 2, 3 **HW:** 692/4, 5, 8ab
11b	15.3 The Center of Data: Mean, Median, Mode (693)	Activities CA-321/1. CA-322/2, 3, 4. CA-323/2. CA-325/1, 2ab. 3. CA-333/1, 2 **Practice** 698/2, 3, 4, 5, 6. **HW:** 700/2, 4, 5, 7 to 10ab, 13, 14,abc, 17, 20*, 21*.
12a	16. Probability (722) 16.1 Basic Principles of Probability (723)	Activities **CA-341/3. CA-342/2, 3.** **Practice** 728/1, 2, 4 **HW:** 729/1, 2, 3, 4, 7
	16.2 Counting Number of Outcomes (730)	Activities **CA-346/1, 3, 4. CA-357/1, 2.** **Practice** 733/1, 2, 3, 4 **HW:** 735/2, 3ab, 5, 6abc
12b	16.3 Calculating Probabilities in Compound Events (736)	Activities **CA-351/16J:1, 2.** **Practice** 739/1abc, 2, 3 **HW:** 741/1 to 8, 10ab, 12, 13, 16ab
	16.4 Using Fraction Arithmetic to Calculate Probabilities (743)	Activities **CA-352/1. CA-354/1, 3c.** **Practice** 747/1, 2, 3* **HW:** 748/1, 2, 10, 11
13ab	**13a. Review;** **13b. Test 3**	
14ab	**14a. Review;** **14b. Review**	
15	**Final Exam**	

Updated 2017-08-06

MTH 113: Introduction to Probability and Statistics with Computer Applications

Required Materials:

- *Elementary Statistics*, 13th edition, by Mario F. Triola. ISBN 978-0-13-446245-5.
- *MyStatLab*, Access code for this course management system is packaged with the new textbook from the CSI bookstore or sold separately at http://www.coursecompass.com. This also provides access to the *StatCrunch* software used in the computer labs.
- *Computer Laboratory Assignments*: The projects can be downloaded at http://www.math.csi.cuny.edu/Courses/MTH113/.
- *TI 83 Plus* or *TI 84 Plus Calculator*. These two models have functions that do substantial amounts of calculation in exactly the manner needed for this class. The textbook contains purple boxes detailing how to use these models to do computations.

Computer Laboratory Classes:
Each semester has 14 laboratory hours scheduled. The dates will vary by section, as will the use of the Q&A periods, which your instructor may use for exam prep or homework help, or to give you extra time to complete the laboratory assignments.

Lesson	Date	Topic	Completed?
1		Q & A (period for asking questions, getting caught up on, exam prep, etc)	
2		Lab #1: Getting Started with StatCrunch	
3		Lab #2: Describing, Exploring and Comparing Data - Graphically	
4		Lab #3: Describing, Exploring and Comparing Data - Numerically	
5		Q & A	
6		Lab #4: Exploring Probabilities	
7		Lab #5: The Normal Distribution	
8		Q & A	
9		Lab #6: Confidence Intervals with known standard deviation	
10		Lab #7: Confidence Intervals with estimated standard deviation	
11		Q & A	
12		Lab #8: Hypothesis Testing	
13		Q & A	
14		Lab #9: Goodness-of-Fit, Contingency Tables, Linear Regression	

Lecture Schedule:
Each semester has 42 lecture classes scheduled. The precise timing of the exams varies from section to section to accommodate weekends, holidays, and the lab schedule, and may be impacted by catastrophic weather or other unpredicted emergencies. The reading and pen-and-paper homework is listed here; your instructor will assign additional problems through *MyStatLab*. For optimal learning, make an attempt at the reading the day before the lecture, attend the lecture, and then start the homework (online or paper) in the hours after the lecture.

Lesson	Date	Topic	Reading	Paper Homework	Completed?
1		1.1: Statistical and Critical Thinking	1–9	P11: 1–20 odd	
2		1.2: Basic Types of Data	13–22	P23: 5–12,29–32	
3		2.1: Frequency Distributions	42–47	P48: 1,4,5,6	
4		2.2: Histograms	51–54	P55: 1–8	
5		2.4: Scatterplots, Correlation, Regression	67–74	P74: 1–4,6,10	
6		3.1: Measures of Center	82–89	P91: 1–5,7,9,12,29,30	
7		3.2: Measures of Variation	97–107	P107: 1–4,7,9,12,37,38	
8		3.3: Relative standing, Boxplots	112–22	P124: 1–4,31	
9		Review for Exam 1			
10		**First Exam, Chapters 1, 2, 3**			
11		**First Exam, Chapters 1, 2, 3**			
12		4.1: Basic Concepts of Probability	131–42	P143: 1–27	
13		4.2: Addition Rule, Multiplication Rule	147–55	P155: 1–4,9,11,21	
14		4.3: Complements, Conditional Probability	159–65	P166: 1–3,7,17–20	
15		4.4: Counting	169–74	P174: 1–4,29	
16		5.1: Probability Distributions	186–95	P195: 1–14	
17		5.2: Binomial Distribution	199–207	P209: 1–4,21,23,25	
18		6.1: Standard Normal Distribution	226-39	P240: 1–20 odds,37	
19		6.2: Applications of Normal Distribution	242–9	P251: 1–20 odds	
20		6.3: Sampling Distributions	254–62	P262: 1–6,11	
21		6.4: CLT, First Hypothesis Test	265–71	P272: 1–4,5,18	
22		Review for Exam 2			
23		**Second Exam, Chapters 4, 5, 6**			
24		**Second Exam, Chapters 4, 5, 6**			
25		7.1: Estimating p	297–310	P311: 1–4,9,13,19	
26		7.2: Estimating μ	316–26	P327: 1–9,11	
27		8.1: Hypothesis Testing	356–70	P371: 1–4,7,8,11,12,15, 16,27,28	
28		8.2: Testing p	373–81	P382: 1–4,13,14,19,27	

Lesson	Date	Topic	Reading	Paper Homework	Completed?
29		8.3: Testing μ	387–94	P396: 1–6,9,12,20,21	
30		9.1: Testing p_1, p_2	414–23	P423: 1–5,7–10,12	
31		9.2: Testing μ_1, μ_2, (independent samples)	428–35	P437: 1–4,7–10,20	
32		9.3: Testing μ_1, μ_2, (matched pairs)	442–7	P449: 1–6,11,12,18	
33		Review CIs			
34		Review Hypothesis Testing			
35		**Third Exam, Chapters 7, 8, 9**			
36		**Third Exam, Chapters 7, 8, 9**			
37		10.1: Correlation	468–81	P483: 1–4,9,17,18	
38		10.2: Regression	489–97	P499: 1–5,17,26	
39		11.1: Goodness-of-Fit	533–41	P542: 1–4,8,11,16	
40		11.2: Contingency Tables	546–55	P556: 1–5,10	
41		Review for Final Exam			
42		Review for Final Exam			

Formulas and Tables

Pages 5 and 6 of the "Formulas and Tables" pages are available in your textbook and also here:

https://media.pearsoncmg.com/aw/aw_triola_elemstats_13_2018/website/stat13t_barrelfold.pdf

They (and *only those two* pages) will be made available to you on the final exam. Their usage on the midterm exams depends on your instructor. The first four pages, the tables, are to be avoided in favor of using a calculator to do the computations.

MTH 233 S2020
JeVu

THE COLLEGE OF STATEN ISLAND, CUNY
DEPARTMENT OF MATHEMATICS

MATH 233 – CALCULUS III
COURSE OUTLINE

Text: Rogawski, Adams & Franzosa, Calculus – Early Transcendentals, 4th Edition.
W. H. Freeman & Co. (2019).
ISBN: 9781319411671 (e-book ISBN: 9781319411657)

Note: Below, each lesson corresponds to a one-hour class. Homework problems in **bold** correspond to similar WeBWorK problems, which must be submitted online. Students are also required to complete five MATLAB projects listed below, which can be obtained in PDF at www.lulu.com with search term "csi math".

Lesson	Section	Topic	Homework Problems
1	12.1	Vectors in the plane	**10, 41, 48, 50, 58,** 61
2	12.2	Vectors in three dimensions	**13, 29, 53, 63**
3	12.3	Dot product	**20, 43, 52, 57, 63, 70,** 82
4	12.4	Cross product	**11, 17, 22, 25, 47**
5	12.4	Cross product	
6	12.5	Planes in three-space	**3, 15, 17, 23, 28, 30,** 41
7	12.5	Planes in three-space	
8	12.6	Quadric surfaces	**9, 19, 21, 25, 43, 45,** 46, MATLAB Project 1
9	13.1	Vector-valued functions	**20, 27, 35, 36, 38, 41, 43**
10	13.2	Calculus of vector-valued functions	**8, 10, 13, 19, 26, 27, 43, 48, 52,** 58
11	13.3	Arc length and speed	**1, 2, 3, 12, 16, 30, 31, 34**, **35**
12	13.3	Arc length and speed	MATLAB Project 2
13	14.1	Functions of several variables	**2, 4**, **6**, 8, **9**, 11, **21, 22**, 23
14	14.2	Limits and continuity in several variables	**1**, 5, **7, 8**, 20, **29, 35, 40**
15	14.3	Partial derivatives	3**, 4, 19, 22**, 25**, 28, 44, 53, 63**
16	14.3	Partial derivatives	
17	14.4	Differentiability and tangent planes	**4, 7, 10, 11, 18, 19, 20, 23, 31, 37, 41**
18	14.4	Differentiability and tangent planes	MATLAB Project 3
19	14.5	Gradient and directional derivatives	**1, 5, 7, 23, 25, 34**, **38**

20	14.5	Gradient and directional derivatives	
21		Review	
22		**Exam 1**	
23		**Exam 1**	
24	14.6	Chain rule in several variables	**1, 2, 6, 9**, **20, 29, 30, 33, 34**, 37, 38
25	14.6	Chain rule in several variables	
26	14.7	Optimization in several variables	**4, 7, 16, 21, 28, 32, 41, 44, 50**
27	14.7	Optimization in several variables	
28	14.8	Lagrange multipliers	**5, 11, 17, 19, 23, 25, 36, 47**
29	14.8	Lagrange multipliers	
30	15.1	Integration in several variables	**1, 7, 16, 19, 29, 37, 40, 42, 44,** 46, **50**
31	15.1	Integration in several variables	
32	15.2	Double integrals over general regions	**1, 7, 22,** 29, **32, 35, 38, 44, 46, 50**
33	15.2	Double integrals over general regions	MATLAB Project 4
34	15.3	Triple integrals	**2, 6, 16,** 17**, 20, 23, 29, 35**, **41**
35	15.3	Triple integrals	
36	12.7	Cylindrical and spherical coordinates	**1, 7, 27, 31, 34, 40,** 52, **69**
37	15.4	Integration in polar, cylindrical coordinates	**3, 9, 17, 21, 23, 27, 34,** 37, **45, 47**
38	15.4	Integration in spherical coordinates	
39	16.1	Vector fields	**3, 15, 24, 43, 46,** 48, **50, 52**
40	16.2	Line integrals	**1, 5, 7, 15, 20, 21, 29, 36, 39, 43**
41	16.3	Conservative vector fields	**3, 8, 11, 13, 14, 15, 19,** 25, 27, 31
42		Review	
43		**Exam 2**	
44		**Exam 2**	
45	16.4	Parametrized surfaces	2, **3, 7, 16, 19, 23, 25, 29, 34, 37**
46	16.4	Surface integrals and surface area	
47	16.5	Surface integrals of vector fields	**3, 7, 11, 15, 17, 23, 30**

48	16.5	Surface integrals of vector fields	
49	17.1	Green's Theorem	**3, 9, 11,** 14**, 15, 18, 29,** 36, 41
50	17.1	Green's Theorem	
51	17.2	Stokes' Theorem	**1, 3, 19, 22, 23, 24, 26,** 27, 29
52	17.2	Stokes' Theorem	
53	17.3	Divergence Theorem	**1, 3, 11, 15, 17, 18, 23, 25**
54	17.3	Divergence Theorem	
55		Final review	
56		Final review	