# Math 309 FALL 20171. Section Information

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| **Section** | **Time** | **Location** | **Instructor** | **email** | **Office Hours** |
| 1  2 | MWF 11am – 12pm  MWF 1 – 2pm | Rebstock 215  Brown 118 | Jack Shapiro | [jshapiro@wustl.edu](mailto:jshapiro@wustl.edu) | M, W : 2:30 – 3:30pm  T, Th : 9:30 – 10:30am  Cupples I ,  107B |
| Webworks must be completed by 11:59 pm on their due date.Homeworks will be handed into crowdmark.com on their due date. They will be returned the following week. ------------------------------------------------------------------------------------------------------------------------------------------------------------- HOMEWORKS : HW #1: section 1.1, problems 48, 50; section 2.1, problems 20, 28  HW #2: sec. 2.2, problems 24, 44; sec. 2.4, problems 14, 40  HW #3: sec. 3.1, problem 28; sec. 3.2, problem 32; sec. 3.3, problem 28; sec. 3.4, problem 22  HW #4: sec 4.4: problem 38; sec 4.5 problem 50; sec 4.6, problem 38; sec. 4.7, problem 24  HW #5: sec. 5.2, problems 24, 30; sec. 5.3: problem 34; sec 5.4: problem 12  HW #6: sec 6.1, problem 30; sec 6.2, problem 18; sec 6.3, problem 40; sec. 6.4, problem 10  HW #7: sec 7.1, problems 24 and 48; sec 7.2, problems 20 and 30  HW #8: sec 8.1, problem 58; sec 8.2, problem 34; sec 8.3, problem 56; sec 8.4, problem 54  HW #9: sec 8.5, problems 20, 30, 32, 40 | | | | | |

## 2. Grading Information

There will be two evening exams during the semester, E1, E2, and a Final Exam.   
  
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| **Exam** | **Date** | **Location** | **Time** |  |
| E1 | October 9th | [Check here on exam day.](http://www.math.wustl.edu/seatlookup/) | 6:30 – 8:30 PM |  |
| E2 | November 13th | [Check here on exam day.](http://www.math.wustl.edu/seatlookup/) | 6:30 - 8:30 PM |  |
| Final Exam | December 18th | [Check here on exam day.](http://www.math.wustl.edu/seatlookup/) | 10:30am – 12:30pm |  |
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**GRADES  :** Each of the Exams,  1, 2 and the final, will count  23%  toward the final course grade while the HW will count 16% , and the remaining  15%  will come from the WW. The formula **T** for the total average will be:   
  
**T = .23(E1 + E2 + F ) +  .16 HW  +  .15 WW**  
Then your   **letter grade**     for the course  will     **not be lower**     than it would be if it were based  on  the scale appearing in the following table .

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| **Numerical Range** | **Letter Grade** |
| 90 - 100 | A |
| 75 – 89.99 | B |
| 60 -  74.99 | C |
| 50  -  59.99 | D |
| 0 -  49.99 | F   or  NC |

**Missed Exams  :**

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| **Rules for Exams :   You should always bring your Washington University Photo  ID  to exams.   You can bring a scientific calculator to the exam for calculations. The exams will be multiple choice.  The following are examples of calculators that are acceptable:  Casio FX-250, Casio FX-260, FX-270, Casio FX-300 Sharp EL-501, Sharp EL-506, Sharp EL-520, Sharp EL-531, Sharp EL-546 TI-30, TI-34, TI-36   Just before each exam I will let you know about room assignments by email . You will be allowed to enter the exam room a few minutes before the starting time to find a seat and get ready for the start of the exam. Make sure you put your correct 6 digit ID number on your answer card. You can take your exam booklet with you after you hand in your card.** |

## 3. Text

Elementary Linear Algebra, 8th Edition, Ron Larson

## 4. Syllabus

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| Week | Sections | Suggested Problems (Only odd problems) |
| #1   M 8/28  W 8/30  F 9/1 | 1.1:   Linear Equations 2.1:   Matrices  2.1: Matrices | **1.1:** 37 - 51  **2.1:** 5, 7, 9, 19,25  **2.1:** 37, 39, 45, 47, 49, 51, 55 |
| #2   M   9/4             W   9/6        F    9/8 | No Class - Labor Day 2.2: Matrix Operations 2.4: Elementary Matrices | **2.2:** 1 – 43, 51, 59 **HW # 1 Due (W)** **2.4:** 1 – 17 |
| #3   M   9/11        W   9/13        F    9/15 | 2.3, 3.1:  Inverse of Matrix, Determinant 3.2: Operations on Determinants  3.3, 3.4: Determinants & Cramer’s Rule | **2.3:** 13, 15, 17, 25, 31, 33, 35, 41 - 47     **WW # 1  Due (M)** **3.1:** 13 – 27, 39, 41, 45 - 51              **3.2:**25 - 33 **HW # 2  Due** (W)  **3.3:** 3,17, 21, 27, 33, 45  **3.4:** 1, 3, 13, 17, 21 |
| #4   M  9/18         W  9/20       F  9/22 | 4.2-4.3: Vector Spaces  4.4: Spanning Sets  NO CLASS ON F 9/22 | **4.2:**  31, 33, 35 **4.3:**  21, 23, 25, 29, 31, 33, 37, 39, 41, 43    **4.4:** 5, 7, 33, 35, 37, 57  **WW #2 Due,** **HW # 3  Due** (W) |
| #5   M  9/25  W  9/27        F   9/29 | 4.5: Basis and Dimensions  4.6: Rank of Matrix  4.7: Change of Basis | **4.5:** 41, 43, 47, 49, 51  **4.6:** 13, 15, 17, 23, 25, 33, 37, 41, 43, 45 **WW # 3  Due**(W)  **4.7:** 7, 9, 13, 15, 19, 21, 23, 45, 47 |
| #6   M   10/2  W  10/4    F   10/6 | 5.2: Inner Product Space  5.3: Gram-Schmidt Process    NO CLASS   F, 10/6 | **5.2:** 5, 7, 9, 11, 21, 23,29, 31, 35, 37, 39, 41   **5.3:** 31, 33, 35, 57, 59, 61  **HW #4** and **WW # 4  Due** (Thursday) |
| #7   M  10/9        W 10/11        F   10/13 | REVIEW FOR EXAM I  EXAM I M, 10/9 6:30-8:30pm 5.4:  Orthogonal Complement    NO CLASS F, 10/13 | All covered material up to and including 4.7 **5.4:**5, 7, 9, 11 |
| #8 M 10/16    W 10/18  F 10/20 | FALL BREAK  6.1: Linear Transformations    6.3: Matrices for Lin. Trans. | **6.1:** 11, 13, 15, 17, 19, 21, 67  **6.3:** 1 – 9 **WW # 5 Due HW # 5 Due (F)** |
| #9 M 10/23  W 10/25  F 10/27 | 6.3: Matrices for Lin. Trans.  6.2: Kernel and Range  6.4: Transition Matrix | **6.3 :** 27 – 39, 43, 45, 47  6.2 : 1 - 23  **6.4:** 1 – 11 |
| #10 M  10/30   W  11/1          F 11/3 | 6.4:   Similarity  7.1:   Eigenvalues and Eigenvectors  7.1: Eigenvalues and Eigenvectors | **6.4:** 13, 17, 19, 21, 23  **WW # 6 Due,**  and **HW # 6 Due** (Wed)  **7.1 :** 9 – 27; 41 - 49 |
| #11  M  11/6         W  11/8  F   11/10 | 7.2:  Diagonalization  7.3:  Symmetric Matrices  7.3:  Orthogonal diagonalization | **7.2:** 1 – 19, 27, 29  **7.3:** 1 – 15  **7.3:**  19, 23, 39, 41, 45, 47, 49    **WW # 7** and **HW # 7 Due**  (F) |
| #12   M  11/13          W  11/15          F  11/17 | REVIEW FOR EXAM II **EXAM  II** 6:30 - 8:30  PM (M)  8.1: Complex Numbers  8.2: Division of Complex Numbers | All covered material between 5.2 and 7.2  **8.1:** 27 – 39, 45 – 53 **8.2:** 1, 3, 7, 9, 15, 17, 31 - 37 |
| #13 M  11/20  W 11/22      F   11/24 | 8.3: Polar Form  THANKSGIVING  THANKSGIVING | **8.3:** 1, 3, 5, 17, 19, 27, 31, 35, 37, 53, 55, 63 |
| #14   M  11/27           W  11/29           F    12/1 | 8.4: Complex Vector Spaces  7.4:  Systems of Differential equations  8.5: Hermitian Matrices | **8.4:** 5, 7, 17, 19, 29, 31, 35, 37, 67, 69    **7.4:** 17, 19, 21, 23, 29,31    **WW &**  **HW # 8 Due**  ( W)  **8.5:** 1, 3, 7, 9, 11, 13, 15 |
| #14   M  12/4           **W** 12/6    **F** 12/8 | 8.5: Hermitian Matrices  8.5: Unitary Matrices  REVIEW SESSION | **8.5: 21, 23,** 25, 27  **8.5 : 33, 35, 37, 39, 41**  **HW # 9 & WW # 9 Due** (F) |
| **M** 12/18 | **FINAL EXAM 10:30am - 12:30pm** |  |

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