Class Schedule - Spring 2019

Actuarial Science and Risk Management

Mathematics
Interim Department Chair: Jeremy Tyson
273 Altgeld Hall: 1409 West Green, Urbana
Phone: 217-333-3350
www.math.illinois.edu/

ASRM 210  Theory of Interest  credit: 3 hours.
Study of compound interest and annuities; applications to problems in finance. Prerequisite: MATH 231 or equivalent.

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<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
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</thead>
<tbody>
<tr>
<td>68699</td>
<td>Lecture-Discussion</td>
<td>M1</td>
<td>09:30 AM - 10:50 AM</td>
<td>TR</td>
<td>1002 - Lincoln Hall</td>
<td>Mortensen, K</td>
</tr>
</tbody>
</table>

Credit Hours: 3 hours
Enrollment restricted to current actuarial science majors until approximately 4:00pm on November 27th. Prospective transfers should review https://math.illinois.edu/system/files/inline-files/transfer-to-actsci-ui-only.pdf Prospective transfers who are not able to register on or after November 27th should fill out the form here to be added to the request list: http://go.math.illinois.edu/SP19ASRM210 The request list will be reviewed in January with decisions available by the Friday before classes begin.

ASRM 390  Introduction to Actuarial Research  credit: 0 TO 3 hours.
Guided research on introductory actuarial topics. Approved for Letter and S/U grading. May be repeated in separate terms. Prerequisite: Instructor approval required.

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<tbody>
<tr>
<td>69684</td>
<td>Independent Study</td>
<td>ASR</td>
<td>ARRANGED -</td>
<td>-</td>
<td>-</td>
<td>Buysse, K</td>
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</table>

Credit Hours: 3 hours
Instructor Approval Required

ASRM 392  Actuarial Problem Solving  credit: 1 hours.
Methods and techniques of solving problems in actuarial mathematics for advanced students intending to enter the actuarial profession. Approved for S/U grading only. May be repeated in the same or separate terms to a maximum of 4 hours. Prerequisite: Consent of instructor.

Students planning to sit for the "Course 1" Actuarial exam should register for section X. This will carry a 1 hour credit only.

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<tr>
<th>CRN</th>
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<th>Time</th>
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<tbody>
<tr>
<td>69330</td>
<td>Seminar</td>
<td>FM</td>
<td>07:00 PM - 08:50 PM</td>
<td>T</td>
<td>245 - Altgeld Hall</td>
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</table>

This section is for students preparing for Exam 2/FM. Students are expected to be enrolled in or have completed ASRM 210 or Math 210.

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</table>
This section is for students preparing for the SOA LTAM exam (formerly MLC). Students are expected to be enrolled in or have completed ASRM 472 or Math 472.

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<td>69329</td>
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This section is for students preparing for Exam 1/P. Students are expected to be enrolled in or have completed ASRM 401, Math 408, Stat 400, or Math 461.

**ASRM 401  Actuarial Statistics I  credit: 4 hours.**

Same as STAT 408. See STAT 408.

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<tr>
<td>68740</td>
<td>Discussion/Recitation</td>
<td>AD2</td>
<td>03:00 PM - 03:50 PM</td>
<td>T</td>
<td>1027 - Lincoln Hall</td>
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<tr>
<td>68738</td>
<td>Discussion/Recitation</td>
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<td>68739</td>
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<td>MWF</td>
<td>1000 - Lincoln Hall</td>
<td>Lee, H</td>
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</table>

For Statistics course registration information: go.illinois.edu/StatisticsRegistration

**ASRM 406  Linear Algebra with Financial Applications  credit: 3 OR 4 hours.**

Emphasizes techniques of linear algebra and introductory and advanced applications to actuarial science, finance and economics. Topics include linear equations, matrix theory, vector spaces, linear transformations, eigenvalues and eigenvectors and inner product spaces. In addition, current research topics such as modeling, data mining, and generalized linear models are explored. 3 or 4 undergraduate hours. 3 or 4 graduate hours. Credit is not given for both ASRM 406 (formerly MATH 410) and any of MATH 125, MATH 225, MATH 415 or MATH 416. 4 hours of credit requires approval of the instructor and department with completion of additional work of substance. Prerequisite: MATH 241; ASRM 210 (formerly MATH 210) or FIN 221; or consent of instructor.

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<td>68700</td>
<td>Lecture-Discussion</td>
<td>T1</td>
<td>03:30 PM - 04:50 PM</td>
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<td>223 - Gregory Hall</td>
<td>Cole, P</td>
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Credit Hours: 3 hours
Restricted to students majoring in Actuarial Science until November 15, 2018. Non-majors interested in this course may register on that date. Some seats are held back for transfer students. Any remaining seats will be released during business hours on the Friday before spring classes begin.

**ASRM 409  Stochastic Processes for Finance and Insurance  credit: 3 OR 4 hours.**

An introduction to stochastic processes and their applications to finance and insurance. Topics include conditional probability, conditional expectation, Markov chains, Poisson processes, reliability theory, Brownian motion and elementary introductions to insurance risk theory and option pricing theory. 3 or 4 undergraduate hours. 3 or 4 graduate hours. Prerequisite: ASRM 401 (formerly MATH 408) or MATH 461.
### ASRM 410  Investments and Financial Markets  
Credit: 3 hours.  
Theoretical foundation in financial models and their applications to insurance and other financial risks. Topics include derivative markets, no arbitrage pricing of financial derivatives, interest rate models, dynamic hedging and other risk management techniques. 3 undergraduate hours. No graduate credit. Credit is not given for ASRM 410 (formerly MATH 476) and MATH 567. Prerequisite: Credit or concurrent registration in STAT 409 or STAT 410.

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<td>12:30 PM - 01:50 PM</td>
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<td>Hinkkanen, A</td>
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Credit Hours: 3 hours  
Restricted to Mathematics or Actuarial Science major(s).  
This class will open to Mathematics majors on November 9, 2018. Students interested in a transfer to actuarial science should see https://math.illinois.edu/system/files/inline-files/transfer-to-actsci-ui-only.pdf

### ASRM 450  Methods of Applied Statistics  
Credit: 3 OR 4 hours.  
Same as STAT 420. See STAT 420.

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<td>01:00 PM - 01:50 PM</td>
<td>MWF</td>
<td>1000 - Lincoln Hall</td>
<td>Stepanov, A</td>
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Credit Hours: 4 hours  
Restricted to Graduate - Urbana-Champaign. Restricted to MS: Actuarial Science - UIUC.  
For Statistics course registration information: go.illinois.edu/StatisticsRegistration

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Credit Hours: 4 hours  
Restricted to Undergrad - Urbana-Champaign.  
For Statistics course registration information: go.illinois.edu/StatisticsRegistration

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Credit Hours: 4 hours  
Restricted to Graduate - Urbana-Champaign. Restricted to MS: Actuarial Science - UIUC.  
For Statistics course registration information: go.illinois.edu/StatisticsRegistration
### ASRM 451  Basics of Statistical Learning  
credit: 3 OR 4 hours.
Same as STAT 432. See STAT 432.

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<td>10:00 AM - 10:50 AM</td>
<td>MWF</td>
<td>1024 - Chemistry Annex</td>
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Credit Hours: 4 hours  
Restricted to Graduate - Urbana-Champaign.  
Restricted to MS: Actuarial Science - UIUC.  
For Statistics course registration information: go.illinois.edu/StatisticsRegistration

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<td>MWF</td>
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Credit Hours: 3 hours  
Restricted to Undergrad - Urbana-Champaign.  
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### ASRM 453  Applied Bayesian Analysis  
credit: 3 OR 4 hours.
Same as STAT 431. See STAT 431.

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<td>1000 - Lincoln Hall</td>
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Credit Hours: 4 hours

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<tr>
<th>CRN</th>
<th>Type</th>
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<tr>
<td>68748</td>
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<td>TR</td>
<td>1000 - Lincoln Hall</td>
<td>Park, T</td>
</tr>
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</table>
ASRM 461  **Loss Models**  credit: 3 hours.

Foundation in the actuarial modeling process; construction, selection and validation of empirical models and parametric models. Also covers survival, severity, frequency and aggregate loss models; statistical methods to estimate model parameters. 3 undergraduate hours. No graduate credit. Credit is not given for ASRM 461 (formerly MATH 478) and ASRM 561 (formerly MATH 568). Prerequisite: ASRM 401 (formerly MATH 408), MATH 461 or MATH 463; credit or concurrent registration in ASRM 402 (formerly MATH 409) or MATH 464.

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<td>68703</td>
<td>Lecture-Discussion</td>
<td>G1</td>
<td>10:00 AM - 10:50 AM</td>
<td>MWF</td>
<td>1002 - Lincoln Hall</td>
<td>Cole, P</td>
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Credit Hours: 3 hours
Restricted to Actuarial Science major(s).
Students interested in a transfer to actuarial science should see https://math.illinois.edu/system/files/inline-files/transfer-to-actsci-ui-only.pdf

ASRM 472  **Life Contingencies II**  credit: 3 hours.

Continuation of ASRM 471. Introduction to tabular or parametric survival models with single or multiple-life states; life insurance and annuity premium calculations; reserving and profit measures; introductions to universal life insurances, participating insurances, pension plans and retirement benefits. 3 undergraduate hours. No graduate credit. Credit is not given for ASRM 472 (formerly MATH 472) and ASRM 575 (formerly MATH 565). Prerequisite: ASRM 471 (formerly MATH 471).

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<tr>
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<td>Lecture-Discussion</td>
<td>G1</td>
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<td>MWF</td>
<td>23 - Psychology Building</td>
<td>Buysse, K</td>
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Credit Hours: 3 hours
Restricted to Actuarial Science major(s).
Students interested in a transfer to actuarial science should see https://math.illinois.edu/system/files/inline-files/transfer-to-actsci-ui-only.pdf

ASRM 490  **Actuarial Research**  credit: 1 TO 4 hours.

Guided research on actuarial topics. 1 to 4 undergraduate hours. 1 to 4 graduate hours. Approved for Letter and S/U grading. May be repeated in separate terms. Prerequisite: ASRM 390 or consent of instructor.

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<tr>
<td>69685</td>
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<td>Buysse, K</td>
</tr>
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Credit Hours: 4 hours
Instructor Approval Required

ASRM 499  **Topics in Actuarial Science**  credit: 1 TO 4 hours.

Covers special topics in actuarial science. 1 to 4 undergraduate hours. 1 to 4 graduate hours. Approved for Letter and S/U grading. May be repeated. Prerequisite: Consent of instructor.
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<td>68706</td>
<td>Lecture-Discussion</td>
<td>PA</td>
<td>01:00 PM - 02:20 PM</td>
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<td>106B1 - Engineering Hall</td>
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Credit Hours: 3 hours
Predictive Analytics
Restricted to Actuarial Science major(s).

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<tr>
<td>68708</td>
<td>Lecture-Discussion</td>
<td>RMP</td>
<td>03:00 PM - 04:20 PM</td>
<td>MW</td>
<td>140 - Burrill Hall</td>
<td>Buysse, K</td>
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</tbody>
</table>

Credit Hours: 3 hours
Risk Management Practices
Restricted to Actuarial Science or Systems Engineering and Design or Finance or Industrial Engineering or Statistics major(s).
Risk Management Practices and Regulation Prerequisite: Stat 410 or Stat 409 or ASRM 402 or Math 461 or equivalent. This course offers a comprehensive coverage of different aspects of risks and regulation of financial institutions. Topics include financial institutions and their trading, risk management frameworks, market risk, interest rate risk, liquidity risk, credit risk, operational risk, latest industry practices and regulation, including Basel and Solvency, fundamental review of trading books, scenario analysis and stress testing, etc. This course is recommended for students interested in risk management career paths (risk analyst, risk manager, risk management consultant, risk control supervisor, director of corporate risk management, chief risk officer, etc.). Note that this section will NOT fulfill any requirement in the Actuarial Science major, unlike section PA.

ASRM 551 **Statistical Learning** credit: 4 hours.
Same as CSE 542 and STAT 542. See STAT 542.

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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign. Restricted to MS: Actuarial Science - UIUC.
For Statistics course registration information: go.illinois.edu/StatisticsRegistration

ASRM 552 **Predictive Analytics** credit: 4 hours.
Focuses on financial and insurance applications of statistical learning techniques to build predictive models, with integrated case studies and training on computational software packages and effective communication of statistical results. Topics include the model building process, data preparation, model selection, refinement and validation. Same as STAT 541. 4 graduate hours. No professional credit. Approved for Letter and S/U grading. Prerequisite: ASRM 401 or STAT 410.

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<th>Instructor</th>
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<td>01:00 PM - 02:20 PM</td>
<td>TR</td>
<td>106B1 - Engineering Hall</td>
<td>Linders, D</td>
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</tbody>
</table>

Restricted to Graduate - Urbana-Champaign.

ASRM 561 **Loss Data Analytics & Credibility** credit: 4 hours.
Introduction to the actuarial modeling process: construction, selection and validation of empirical and parametric models. Survival, severity, frequency and aggregate loss models; statistical methods to estimate model parameters. 4 graduate hours. No professional credit. Credit is not given for ASRM 461 (formerly MATH 478) and ASRM 561 (formerly MATH 568). Prerequisite: ASRM 401 (formerly MATH 408), MATH 461 or MATH 463.
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<td>10:00 AM - 10:50 AM</td>
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<td>1002 - Lincoln Hall</td>
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Credit Hours: 4 hours
Restricted to Graduate - Urbana-Champaign. Restricted to MS:App Mth-Actuarial Sci -UIUC or MS: Actuarial Science - UIUC.

ASRM 595  **Advanced Topics in Actuarial Science and Risk Analytics**  credit: 1 TO 4 hours.
Covers special topics in actuarial science and risk analytics. 1 to 4 graduate hours. No professional credit. May be repeated if topics vary. Prerequisite: Consent of instructor.

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<tr>
<td>68709</td>
<td>Lecture-Discussion</td>
<td>RMP</td>
<td>03:00 PM - 04:20 PM</td>
<td>MW</td>
<td>140 - Burrill Hall</td>
<td>Buysse, K</td>
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Credit Hours: 4 hours
Risk Management Practices
Restricted to Graduate - Urbana-Champaign.
Risk Management Practices and Regulation

ASRM 598  **Literature Seminar**  credit: 0 TO 4 hours.
Students present seminars and discussions on advanced topics in areas of actuarial and financial mathematics and advanced analytics. 0 to 4 graduate hours. No professional credit. Approved for Letter and S/U grading. May be repeated in separate terms or up to 8 hours in the same term if topics vary. Prerequisite: Consent of instructor.

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Instructor Approval Required