## Actuarial Science--Predictive Analytics Option <br> 2020-2021 calendar

|  | Course | Year/ <br> Term | Topic | Pre-reqs | Offering | SOA exams | CAS exams | Comments |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | $\begin{array}{\|c\|} \hline \text { CS } 115 \text { or CS } 135 \text { or } \\ \text { CS } 145 * \\ \hline \end{array}$ | 1A | CS Core I |  | FWS |  |  | * a few other options - see first year advisor if you have issues |
| 2 | MATH 135/145 | 1A | Algebra |  | FWS |  |  |  |
| 3 | MATH 137/147 | 1A | Calculus I |  | FWS |  |  |  |
| 4 | Math English course | 1A | Course from English Language Competency requirements list |  | FWS |  |  |  |
| 5 | MTHEL 131 | 1 | Intro to Actuarial Practice |  | FWS |  |  | $\geq 60 \%$ Requried for admission to ACTSC |
| 6 | $\begin{array}{\|c\|} \hline \text { CS } 116 \text { or CS } 136 \text { or } \\ \text { CS } 146 * \\ \hline \end{array}$ | 1B | CS Core II | CS Core I | FWS |  |  | * a few other options - see first year advisor if you have issues |
| 7 | MATH 136/146 | 1B | Linear Algebra 1 | $\geq 60 \%$ in M135 | FWS |  |  |  |
| 8 | MATH 138/148 | 1B | Calculus II | $\geq 60 \%$ in M137 | FWS |  |  |  |
| 9 | ECON 101 | 1 | Intro microeconomics |  | FWS | VEE-E | VEE-E |  |
| 10 | ECON 102 | 1/2 | Intro macroeconomics |  | FWS | VEE-E | VEE-E |  |
| 11 | AFM 101 | 1 | Introduction to Financial Accounting |  | FWS | VEE-AF | VEE-AF |  |
| 12 | MATH 235/245 | 2A | Linear Algebra 2 | $\geq 60 \%$ in M136, Coreq M138 | FWS |  |  |  |
| 13 | MATH 237/247 | 2A | Calculus 3 | $260 \%$ in $\mathrm{M} 136,260 \%$ in M138 | FWS |  |  |  |
| 14 | STAT 230/240 | 2A | Probability | M. $137 \times 80 \%$ or M138 | FWS | P | P |  |
| 15 | ACTSC 231 | 2A | Introductory Financial Mathematics | M137, level 2A, Coreq S230 | FWS | FM | FM |  |
| 16 | AMATH 250 | 2 | Intro to diff equations | M138 | FWS |  |  |  |
| 17 | STAT 231/241 | 2B | Statistics | M138,S230 | FWS |  |  |  |
| 18 | ACTSC 232 | 2B | Life Contingencies 1 | $\geq 60 \%$ in A232, $>60 \%$ in MTHEL 131, <br> S. 230 | FWS | LTAM |  |  |
| 19 | ACTSC 371 | 2/3 | Introduction to Investments | Coreq S231 | FWS | IFM | IFM |  |
| 20 | ACTSC 363 | 3A | Casualty and Health Insurance Mathematics 1 | Coreq S330 | FW (S-?) | STAM |  | First offering is Winter 2021 |
| 21 | ACTSC 331 | 3A | Life Contingencies 2 | $\geq 60 \%$ in AS232 | FWS | LTAM |  |  |
| 22 | STAT 330 | 3 | Mathematical Statistics | M237, $\geq 60 \%$ in $\mathrm{S} 230, \mathrm{~S} 231$ | FWS | VEE-MS |  |  |
| 23 | STAT 331 | 3 | Applied linear models | $\mathrm{M} 235, \geq 60 \%$ in S231 | FWS | SRM, PA | MAS-I |  |
| 24 | STAT 333 | 3 | Applied probability | $\geq 60 \%$ in S230, level 3A | FWS |  | MAS-I |  |
| 25 | ENGL 378/MTHEL 300 | 3B/4 | Professional Communications in Statistics and Actuarial Science | (AS331 or S331), $270 \%$ in EMLS 101R, 102R, EMLS/ENGL 129R, ENGL 109, SPCOM 100, 223 | FWS | PA |  |  |
| 26 | CS 330 | 3/4 | Management Informaiton Systems | CS Core II, M136, M237,S231 | FW |  |  |  |
| 27 | STAT 341 | 3/4 | Computational Statistics and Data Analysis | 260\% in S230,M237, S231 | FW |  |  | STAT 340 is NOT accepted |
| 28 | ACTSC 431 | 4 | Casualty and Health Insurance Mathematics 2 | $\geq 60 \%$ in A363, S330 | FS | STAM |  | First offering is Spring 2021 |
| 29 | ACTSC 446 | 4 | Mathematics of Financial Markets | (AS231, 371), (S333 or 334) | FW | IFM | IFM |  |
| 30 | STAT 431 | 4 | Generalized linear models | S330,(S331 or S371) | FWS | SRM | MAS-I |  |
| 31 | STAT 441 | 4 | Statistical Learning - Classificaiton | S341 or (S330+340) | FW | PA | MAS-II |  |
| 32 | STAT 443 | 3/4 | Forecasting | S331 | FWS |  | MAS-I |  |
| 33 | One of |  |  |  |  |  |  |  |
|  | ACTSC 454 | 4 | Longevity and Mortality using Predictive Analytics | AS331,S330 | W | LTAM |  | Formerly ACTSC 433 |
|  | STAT 437 | 4 | Statistical Methods for Life History Analysis | S431 | W |  |  |  |
| 34 | One of |  |  |  |  |  |  |  |
|  | STAT 440 | 4 | Computational Inference | S341 | ws |  |  |  |
|  | STAT 442 | 4 | Date Visualization | S231 | FW |  |  |  |
| + | 2 Additional 400 level | ACTSC | courses -- If ACTSC 454 is used above as \#33, thent | en only 1 Additional: |  |  |  |  |
|  | ACTSC 432 | 4 | Property \& Casualty Insurance: Pricing | A363, S330, S331/371 | FS | STAM | MAS-II |  |
|  | ACTSC 445 | 4 | Quantitative Enterprise Risk Management | (AS231,371), (S330 and 333 or 334) | FS |  |  |  |
|  | ACTSC 453 | 4 | Basic Pensions Mathematics | AS331 | W (odd years) |  |  |  |
|  | ACTSC 455 | 4 | Life Contingencies 3 | $\geq 60 \%$ in AS331, co-req A446 | w | LTAM |  |  |
|  | ACTSC 463 | 4 | Intro to Property \& Casualty Loss Reserving | A363, S331/371 | W (not certain) | STAM | Exam 5 |  |
| + | 4 (or 5) Additional non-math courses |  |  |  |  |  |  |  |
| + | If ACTSC 454 is used as course \#33, then 5 additional course is required to meet the 40 courses. |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | Students who want a double major with Statistics must have STAT 332 and a total of 3 STAT 4XX courses |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | Total 40 courses |  |  |  |  |  |  |  |

SOA and CAS exam mappings are intended to be a guideline for students.
The entire CAS MAS-II syllabus cannot be directly mapped to the program's courses. In addition to the courses indicated above, students preparing for this exam may also consider taking STAT 430, STAT 442 and STAT 440.
For CIA Accreditation information: https://uwaterloo.ca/statistics-and-actuarial-science/current-undergraduate-students/canadian-institute-actuaries-cia-accreditation
Occassionally mistakes are found on these sheets. Make sure you have the most up to date version, and know that a mistake on this sheet, will not allow you to graduate missing a required course. The undergraduate calendar is the official list of required courses for any program and these sheets are created to help things be easier for you.

