

**B. S. Mathematics (MAT)***College: Arts & Sciences*

Option 3: Operations Research

**DEGREE REQUIREMENTS**

Course requirements for all UNCW degrees include: (1) University Studies, (2) specific major requirements, and (3) sufficient elective hours for a combined total of a minimum of 124 hours.

**(1) UNIVERSITY STUDIES<sup>1</sup>**

See University Studies requirements online: <http://uncw.edu/uc/advising/unistudies.html>.

**(2) MAJOR REQUIREMENTS – MAT (Minimum 55 hours)****Core Courses: (34 hours)**

_____ + <sup>2,3</sup> <b>MAT 161</b>	Calculus with Analytic Geometry I (4) Prerequisite: MAT 112 or 115 or equivalent preparation
_____ <sup>3</sup> <b>MAT 162</b>	Calculus with Analytic Geometry II (4) Prerequisite: MAT 161
_____ * <sup>3</sup> <b>MAT 261</b>	Multivariate Calculus (4) Prerequisite: MAT 162
_____ <b>MAT 275</b>	Axiomatic Systems (3) Prerequisite: MAT 152 or 161
_____ <b>MAT 311</b>	Intermediate Analysis (3) Prerequisites: MAT 261 and 275
_____ <sup>3</sup> <b>MAT 335</b>	Linear Algebra and Matrices (3) Prerequisite: MAT 162
_____ <b>MAT 336</b>	Abstract Algebra (3) Prerequisite: MAT 275 or consent of instructor
_____ <b>MAT 495</b>	Seminar in Mathematics (3) Prerequisite: 9 hours of mathematics courses at the 300-400 level (Meets <b>Oral Communication</b> and <b>Applied Learning Requirements</b> )
_____ + <sup>3</sup> <b>STT 215</b>	Introduction to Statistics (3) Prerequisite: Satisfactory performance on the mathematics placement test or MAT 105
_____ <b>STT 315</b>	Probability and Statistics (3) Prerequisites: STT 215 and MAT 152 or 162
_____ <sup>3</sup> <b>CSC 112</b>	Introduction to Computer Programming (3) Prerequisite: MAT 111 or 115
_____ or + <sup>3</sup> <b>CSC 121</b>	Computer Science I (3) Prerequisite: MAT 111 or 115

**Option 3: Operations Research (21 hours)**

_____ <b>MAT 435</b>	Linear Programming (3) Prerequisites: CSC 112 or 121 and MAT 335
_____ <b>MAT 436</b>	Discrete Optimization (3) Prerequisite: MAT 435
_____ <b>MAT 465</b>	Applied Probability (3) Prerequisites: MAT 261 and STT 315
_____ <b>STT</b> _____	Choose one of the following: STT 305, 411, 412.
_____	Choose 9 hours of MAT or STT at the 300-400 level.

<sup>1</sup>+\***PHY 201** is highly recommended as the University Studies Scientific Approaches requirement

<sup>2</sup>Students interested in the degree program in MAT are encouraged to begin with MAT 161. Initial placement is based on high school background and the MAT Placement Test. Students not prepared for MAT 161 should begin with MAT 115 or 111-112, as appropriate.

<sup>3</sup>**Computer Requirement:** MAT +**161-162**, \*261, and 335; STT +**215** and **CSC 112** or +**121**.

**NOTE:** It is strongly recommended that a student either complete a minor in a discipline that applies mathematics or elect advanced coursework involving mathematical applications in another discipline. A list of recommended courses in biology, chemistry, computer science, earth sciences, economics, information systems and operations management, physics, psychology, sociology, and statistics is available in the department office. A student who plans to pursue graduate study is urged to take MAT 411-412.

An overall average of “C” (2.00) or better is required for all 300-400 level MAT or STT courses counted toward the major.

\**These courses require a lab*

+*May also be used to satisfy University Studies Foundations & Approaches and Perspectives requirements*

**Highlighted courses** may meet University Studies Cluster, Competency, Exploration and/or Capstone course requirements

**(3) ELECTIVES**

\_\_\_\_\_ Elective hours to equal a minimum of 124 hours (*Recommended areas related to MAT: computer science, economics, information systems and operations management*)

**Requirements to declare MAT:** Completion of 24 hours

For further information, see the MAT website: <http://www.uncw.edu/math> and <http://catalogue.uncw.edu>.

**MAJOR REQUIREMENTS WITHIN UNIVERSITY STUDIES**

**Note:** **Highlighted courses** are within the major requirements/electives and also meet University Studies Cluster, Competency, Exploration and/or Capstone Course requirements.

**THEMATIC TRANSDISCIPLINARY CLUSTERS**

*(At least 9 hours and 3 courses with at least 2 different prefixes – all eligible for multiple-counting.)*

*Students who complete a minor, a second major, or an approved concentration in their major are exempt from the requirement.)*

**Modeling:** ANT 105, 207, BIO 201, 366, CHM 101, **CSC 112, 121**, EVS 195, MAT 101, 151, 152, **161, 162**, PSY 105, 256.

**Immigration:** ANT 316, 327, ENG 344, FRH 421, HON 210, HST 106, 340, INT 105, SPN 323, 490.

**Climate Change and Society:** ANT 312, GGY 140, 230, 333, 340, 436, GLY 250, 350, 420.

**Global Diversity:** ENG 341, 359, HEA 320, HST 104, 367, INT 105, PAR 230, 232, PED 206, 235, 350, REC 265, 351, 494.

**Foundations for Systems Thinking:** BIO 105, 201, 345, 366, ECN 221, 250, EXS 216, 217, RTH 468.

**Evolution:** ANT 210, 320, 322, 324, 328, BIO 105, 202, 430, 475, GLY 132, 135, 337, PSY 257.

**BUILDING COMPETENCIES**

**A. Writing Intensive:** *(9 hours with at least one at the 300 – 400-level and at least one in the major)*

ACG 445, ANT 305, 308, 312, ARH 476, ART 476, ATR 445, BIOL 345, 366, CHM 250, CHML 321, 420, CLA 209, 210, 330, COM 305, CRM 495, CRW 203, 496, CSC 385, 450, EBD 490, ECN 422, EDN 300, 352, ENG 110, 111, 202, 204, 205, 211, 223, 224, 225, 226, 227, 230, 232, 233, 290, 313, 495, 496, EVS 495, FIN 330, FRH 402, 411, 421, 470, 485, 491, 498, 499, FST 317, 367, 440, 445, 496, GER 495, 499, GGY 333, 382, 435, 436, 499, GLY 337, 390, 420, 499, HEA 305, HST 290, 408, 412, 414, 418, 440, 442, 444, 446, 448, 450, 454, 456, 477, 478, 480, 481, 483, 485, 487, 495, 496, 497, INT 490, MAT 346, **495**, MGT 352, 458, MKT 343, MUS 351, 352, NSG 415, OCN 390, 490, 499, PAR 301, 371, 373, 374, PED 415, PLS 401, PSY 355, 410, 412, 417, 423, 425, 464, REC 375, SED 372, SOC 490, 496, SPN 497, SWK 320.

**B. Information Literacy:** *(9 hours; First-Year Seminar and two additional courses with at least one in the major)*

ANT 308, 312, ARH 476, ART 476, ATR 445, BIO 495, BIOL 495, CHM 250, COM 200, CRM 300, 495, CRW 204, CSC 385, ECN 422, ENG 103, 200, 201, 202, 204, 205, EVS 495, EXS 359, FRH 304, 311, 318, 404, FST 371, 372, 376, 377, 378, 379, GER 495, GGY 215, 222, GLY 350, 390, HEA 452, HON 110, HST 290, INT 490, **MAT 495**, NSG 415, OCN 350, 390, 490, PAR 300, 301, 400, PLS 201, PSY 355, 410, 412, 417, 423, 425, 464, SEC 430, 431, SOC 300, 390, 490, 496, SPN 497, SWK 321, UNI 101.

**C. Quantitative and Logical Reasoning:** *(3 hours – may be taken as a major requirement)*

ANT 324, BIOL 366, CHM 101, **CSC 112, 121**, 133, FST 445, GGY 215, 222, 235, GLY 226, 350, 390, 426, MAT 101, 102, 111, 112, 115, 141, 142, 151, 152, **161, 162**, OCN 350, 390, OPS 370, PAR 110, 218, PHY 101, 102, **201**, 202, PLS 201, PSY 225, STT 210, **215**.

**EXPLORATIONS BEYOND THE CLASSROOM**

*(1 approved experience from the options below – may be integrated into the major or any other component)*

**Discovery** (Directed Individual Study or Honors project), **Application** (Internships, Fieldwork Practicum, Student Teaching), **Regional Engagement** (Service Learning Projects), **Exploration Away** (Study Abroad)

ACG 491, 498, ANT 491, 498, ANTL 207, ART 491, BIO 291, 480, 491, 493, 495, 498, BIOL 495, BLA 491, 498, CHM 495, COM 491, 498, CRM 490, CSC 450, 491, 498, EBD 491, 498, ECN 491, 498, EDN 318, 323, 335, 352, 338, 355, 409, 411, 465, 466, 467, EDNL 200, 300, 302, 332, 333, 388, 407, 450, 451, ENG 202, 204, 302, 498, EVS 431, 491, 497, 498, EVSL 195, EXS 347, FIN 491, 498, FRH 491, FST 498, GER 491, 498, GGY 424, 491, 498, GLY 390, 470, 491, 498, INT 294, 494, 491, 498, MAT 498, MIS 411, 413, 491, 498, MGT 491, 498, MKT 491, 498, OCN 390, 491, OPS 491, 498, PAR 400, PHY 315, 477, 481, PLS 294, 491, 494, 498, PSY 291, 451, 491, REC 498, RTH 498, SEC 220, 320, 421, 422, 431, SED 250, 350, 354, 355, 362, 367, 374, 375, 411, SEDL 368, 369, SOC 390, 496, SPN 490, 491, 498, STA 294, SWK 496, 497, WMS 498, 491, xxx 499.

**CAPSTONE COURSES**

*(1-4 hours – may be taken as a major requirement)*

ANT 450, ARH 476, ART 476, BIO 495, BIOL 495, CHM 491, CRM 495, CRW 496, CSC 450, 455, ECN 422, EDN 409, 411, 465, ENG 495, 496, EVS 495, EXS 347, FRH 404, 411, 421, 437, 448, 470, 485, FST 495, 496, GER 495, 499, GGY 495, GLY 470, 495, HEA 498, HST 408, 412, 414, 418, 440, 442, 444, 446, 448, 450, 454, 456, 477, 478, 480, 481, 483, 485, 487, 495, 496, 497, INT 490, **MAT 495**, MGT 455, MUS 493, 496, NSG 403, 405, PAR 400, PHY 497, PLS 401, PSY 410, 412, 417, 423, 425, 464, REC 498, SED 411, SOC 490, 496, SPN 497, STT 490, 498, SWK 496, 497.