

**GRADUATE MAJOR CHANGE BULLETIN NO. 7**  
**Addendum No. 1**  
**Spring 2012**

The requirements and courses listed below reflect the graduate major curricular changes approved by the Catalog Subcommittee and the Graduate Studies Committee since approval of the last Graduate Major Change Bulletin. All new and revised courses are printed in their entirety under the headings Proposed and Current, respectively. The column to the far right indicates the date each change becomes effective.

Unit/Subject	Course Number	New Revise Drop	Current	Proposed	Effective Date
BIOLOGY	579	New	--N/A--	<b>Mathematical Modeling in the Biological and Health Sciences 3</b> Techniques, theory, and current literature in mathematical modeling in the biological and health sciences, including computational simulation. (Course offered as BIOLOGY 579, MATH 579)	8-12
FS	509	New	-- N/A --	<b>Principles of Environmental Toxicology 3</b> Fundamental toxicological concepts including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, and carcinogenesis; chemodynamics of environmental contaminants including transport, fate, and receptors; chemicals of environmental interest and how they are tested and regulated; risk assessment fundamentals. Students registering for FS 509 are required to prepare an additional in-depth report. Course taught by UI, open to WSU students (FS/EnvS 409). Recommended preparation: BIOLOGY 102 or 107; CHEM 102; CHEM 105; CHEM 106; STAT 205. Offered at 400 and 500 level.	8-12
Earth and Environmental Sciences, revise graduation		Revise	The Ph.D. dissertation should be a significant contribution to the science of geology, worthy of publication in referred international journals.	The Ph.D. dissertation should be a significant contribution to the science of geology, worthy of publication in referred international journals.	8-12

requirements  
in PhD in  
Geology

~~Geology Ph.D. candidates are required to choose an area of specialization in Geology listed below. Each specialization outlines required courses and provides additional help to design a program. The student's program should be one of, or a combination of not more than two areas.~~ The choice of course options and electives in the Geology Ph.D. program will be based on the student's research interest and needs. Undergraduate pre-requisites must be satisfied for all courses within the selected program, and will not count for graduate credit. It is expected that the Ph.D. degree requirements with previous M.S. degree be completed in three years (full-time enrollment, with assistantship), and that Ph.D. degree requirements without previous M.S. degree be completed in four years.

~~Geology Ph.D. candidates must take 30 hours of 500-level graded major course work. The thesis program must consist of not less than 34 hours of graded course work beyond the bachelor's degree.~~ It should include the most advanced courses appropriate to the field of study. Of the minimum 34 hours required, up to 9 credits of non-graduate credit (300- or 400-level) may be used. Graded seminars numbered 500 or above may be a part of the core program. Courses graded Pass/Fail may not be used in the core program. Only those master's degree and transfer courses at a level equivalent to 400- and 500-level courses, and applicable to the doctoral core program should be listed in this category. Any course included in the program in which a grade of "C-" or below is earned must be repeated but not on a Pass/Fail basis.

The choice of course options and electives in the Geology Ph.D. program will be based on the student's research interest and needs. Undergraduate pre-requisites must be satisfied for all courses within the selected program, and will not count for graduate credit. It is expected that the Ph.D. degree requirements with previous M.S. degree be completed in three years (full-time enrollment, with assistantship), and that Ph.D. degree requirements without previous M.S. degree be completed in four years.

Geology Ph.D. candidates possessing a M.S. degree must take a minimum of 15 hours of 500-level graded major course work.  
Geology Ph.D. candidates without a M.S. degree must take a minimum of 27 hours of 500-level graded major course work. In either case, the program must consist of not less than 34 hours of graded course work beyond the bachelor's degree. It should include the most advanced courses appropriate to the field of study. Of the minimum 34 hours required, up to 9 credits of non-graduate credit (300- or 400-level) may be used. Graded seminars numbered 500 or above may be a part of the core program. Courses graded Pass/Fail may not be used in the core program. Only those master's degree and transfer courses at a level equivalent to 400- and 500-level courses, and applicable to the doctoral core program should be listed in this category. Any course included in the program in which a grade of "C-" or below is earned must be repeated but not on a Pass/Fail basis.

In addition to the core requirement, the program shall show Research

			<p>In addition to the core requirement, the program shall show Research and Additional Studies. This includes Special Projects 600, and Doctoral Research 800 (minimum of 20 hours). This category may also include additional graded or Pass/Fail courses and seminars taken at WSU. The program may not include courses graded Pass/Fail or courses that are audited. Credit in this category, plus that in the core program must total at least 72 hours.</p> <p><del>Geology Ph.D. candidates are also required to complete one of the following:</del></p> <p><del>A course in statistics, meeting thesis committee approval.</del></p> <p><del>Math through differential equations (Math 315) or a committee approved equivalent.</del></p> <p><del>Passage of the WSU Graduate Foreign Language Translation Exam in languages other than native language. For foreign students, passage of the English Proficiency Exam would satisfy this requirement.</del></p> <p><del>Two courses in chemistry or physics at or above the WSU 300 level.</del></p> <p>Geology Ph.D. candidates must enroll in Geol 598 (Seminar) a minimum of 2 semesters. Both preliminary and final exams will be required to test the candidate's knowledge of geology with emphasis on the work presented in the dissertation and general fields of knowledge pertinent to the degree.</p>	<p>and Additional Studies. This includes Special Projects 600, and Doctoral Research 800 (minimum of 20 hours). This category may also include additional graded or Pass/Fail courses and seminars taken at WSU. The program may not include courses graded Pass/Fail or courses that are audited. Credit in this category, plus that in the core program must total at least 72 hours.</p> <p><u>Students whose native language is other than English must pass the English Proficiency Exam.</u></p> <p>Geology Ph.D. candidates must enroll in Geol 598 (Seminar) a minimum of 2 semesters. Both preliminary and final exams will be required to test the candidate's knowledge of geology with emphasis on the work presented in the dissertation and general fields of knowledge pertinent to the degree.</p> <p><u>Students will develop a program of coursework fulfilling these requirements in consultation with their major advisor and dissertation committee.</u></p> <p><u>Students must pass a preliminary examination designed to measure their qualifications to pursue a doctoral degree.</u></p>	
KINES	586	Revise	<p><b>Methods of Health and Physical Education 2</b> Physical activity and health promotion for school programs, and educational/legal issues on physical and sexual abuse, K-8.</p>	<p><b><u>(KIN) Methods of Health and Physical Education 2</u></b> Physical activity and health promotion for school programs, and educational/legal issues on physical and sexual abuse, K-8.</p>	8-12
MATH	579	New	--N/A--	<p><b>Mathematical Modeling in the</b></p>	8-12

				<p><b>Biological and Health Sciences 3</b> Techniques, theory, and current literature in mathematical modeling in the biological and health sciences, including computational simulation. (Course offered as BIOLOGY 579, MATH 579)</p>	
MSE		Revise	<p><b>CORE:</b> (16 credits) MatS 505 Advanced Materials Science. (4) MatS 571 Microscopic Analysis of Surfaces. (3) A graduate Thermodynamics course (one of Phys 533, MSE 514, Chern 531, Phys 534, Chern 534, ME 526/527) (3) Phys 563 or Phys 463 Solid State Physics; Chern 480 Solid State Chemistry. (3) A graduate math course: Math 540 Applied Mathematics or Phys 571 Methods of Theoretical Physics (3) <b>ADDITIONAL COURSES:</b> (minimum of 18 credits) Additional courses are selected by the student in consultation with their research advisor and thesis committee. Any 400-500 level courses in engineering, mathematics and the physical sciences are usually acceptable unless they have been used for credit in the undergraduate program. Whenever a course is cross-listed with a Mat S course, students should sign up for the Mat S course. Suggested courses include, but are not limited to Chern 501 Advanced Inorganic Chemistry (3) Chern 532 Advanced Physical Chemistry (3) Chern 536 Quantum Chemistry (3) Mat S 506 Biomaterials (3) MatS 516 Phase Transformations (3) MatS 521 Statistics of Microstructures (3) ME 530 Solid Mechanics (3) ME 537 Fracture Mechanics and Mechanisms (4)</p>	<p><b>CORE:</b> <i>16 credit hours = 4 credits of Mandatory coursework (i) + 12 credits chosen from four of topics (ii) through (x)</i> (i) MANDATORY CORE COURSE: <i>Advanced Materials/MATS/MSE 505</i>, 4 credits (ii) <i>Thermodynamics</i> (Thermo. Solids/MSE 514, Chern 531, Thermal &amp; Statistical Phys.I/PHYS 533, Thermal &amp; Statistical Phys.II/PHYS 534, ME 526) (iii) <i>Solid State</i> (Phys. Solid State/PHYS 563, Solid State &amp; Mater. Phys./PHYS 463, Sol. State Chern/ CHEM 480) (iv) <i>Materials Characterization</i> (Microscopic Anal./MATS 571, Stats. of Microstructure /MSE/MATS 521) (v) <i>Advanced chemistry</i> (Adv. Anal. Chem./CHEM 520, Adv. Inorg. Chem./CHEM 501, Adv. Org. Chem/CHEM 532, Phys. Org. Chem/CHEM 542) (vi) <i>Quantum Mechanics/ Quantum Theory</i> (Adv. Phys. Chem/CHEM 532, PHYS 450, PHYS 550) (vii) <i>Macro-Mechanics</i> (Adv. Mech. Mater/CE 514, Adv. Fracture Mech./MSE 537, Continuum Mechanics/ME 501, Elasticity/ME 530, Plasticity/ME 531) (viii) <i>Micro-Mechanics</i> (Mechanical Behavior of Materials/MSE513, Mechanics of Composite Materials/ME/MSE 534) (ix) <i>Transport/Kinetics</i> (Transport Phenomena/ ChernE 510, Chemical Engineering</p>	

			<p>MSE 515 Electronic Properties of Materials (3)  Phys 561 Atomic and Molecular Physics (3)  Phys 575 Advanced Solid State Physics (3)  <b>SEMINAR:</b>  · MatS 593 Seminar in Materials Science (1). May be repeated for credit. Minimum 6 credit hours required.  <b>RESEARCH CREDITS:</b>  At least 20 credits of MatS 800.  <b>OTHER REQUIREMENTS:</b>  The program must include enough 500-level courses to satisfy the Graduate</p>	<p>Kinetics/ChemE 529, Phase Transform./MSE 516, Heat Transfer/ME 404)  (x) <i>Multi-Component Systems and Interfaces</i> (Thin Films/MSE 517, Adhesion/CE 597 /MSE 547, Interfacial Phenomena/ ChernE 585, Engineering Composites/MSE 404)  <b>.ADDITIONAL COURSES:</b>  (minimum of 6 credits)  Additional courses are selected by the student in consultation with their research advisor and thesis committee. Any 400-500 level courses in engineering (MSE, ME, CE, ChE), the physical sciences (PHYS and CHEM), and mathematics (MATH) are usually acceptable unless they have been used for credit in the undergraduate program. Any of the courses listed under the core (above), which have not been counted towards the satisfying the core requirement, may be counted as additional.course(s).  Whenever a course is cross-listed with a MatS course, students should sign up for the MatS course.  <b>SEMINAR:</b> (minimum 6 credits)  MatS 593 Seminar in Materials Science (1). May be repeated for credit.  <b>RESEARCH CREDITS:</b>  At least 20 credits of MatS 800.  <b>OTHER REQUIREMENTS:</b>  - The program must include enough 500-level courses to satisfy the Graduate School.  -No more than two 400-level courses may count towards degree requirements.</p>	
PHARDSCI	599	New	--N/A--	<p><b>Special Projects 2</b> May be repeated for credit; cumulative maximum 4 hours. Laboratory research, clinical research, or comprehensive review of selected subjects. S, F grading.</p>	8-12
Teaching and Learning,		Revise	The Master of Education (EdM) degree is designed for students	The Master of Education (EdM) degree is designed for students	8-12

<p>revise graduation requirements in EdM</p>			<p>wishing to extend their knowledge and skills in education, expand their content knowledge, and/or pursue leadership roles in schools and organizations/agencies. The EdM degree program consists of a minimum of <del>35</del> credits, <del>33</del> of which must be graded course work. A minimum of one, three credit research course and one, three credit foundations course must be included in the <del>33</del> graded credits. A minimum of 2 credits of T&amp;L 702 are required and usually involve research/scholarship activities associated with the special project and final oral examination. The performance criteria in T&amp;L 702 are based on a satisfactory/fail scale, as opposed to a letter grade. Options for specialization within the EdM degree program include: Literacy, Curriculum and Instruction, Special Education, and English Language Learners/Bilingual Education.</p>	<p>wishing to extend their knowledge and skills in education, expand their content knowledge, and/or pursue leadership roles in schools and organizations/agencies. The EdM degree program consists of a minimum of <u>31</u> credits, <u>29</u> of which must be graded course work. A minimum of one, three credit research course and one, three credit foundations course must be included in the <u>31</u> graded credits. A minimum of 2 credits of T&amp;L 702 are required and usually involve research/scholarship activities associated with the special project and final oral examination. The performance criteria in T&amp;L 702 are based on a satisfactory/fail scale, as opposed to a letter grade. Options for specialization within the EdM degree program include: Literacy, Curriculum and Instruction, Special Education, and English Language Learners/Bilingual Education.</p>	
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