Graduate Council Curriculum Committee
January 21, 2010
12:00, MH 395

Agenda

1. Welcome and call to order
2. Approval of minutes from meeting of 12/03
3. Courses and special topics
4. Revisions to the M.S. in Mathematical Science, COS
5. Revisions to the Ph.D. in Mathematics, COS
6. Curriculum revisions to the Higher Education track, Ph.D. in Education, COE
7. Redesign of the Ed.D. in Ed Leadership to the Executive Ed.D. in Ed Leadership, COE
8. Addition of a PSM Biotechnology track to the MS in Biotechnology, COM - **REMOVED**
9. Review of materials and supplies fee requests
10. Adjournment

Members of the Graduate Council Curriculum Committee:

Patricia Bishop, Ex Officio for CGS
Deborah Breiter, RCHM
Naim Kapucu, COHPA
Jean Kijek, CON
Joyce Nutta, COE, Chair
Max Poole, Liaison for CGS
Tison Pugh, CAH
Martin Richardson, COP
Sergio Tafur, GSA
James Turkson, COM
Art Weeks, CECS
TBD, COS

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

Program Recommendation Form

This form is to be used to revise, add, suspend, or delete degree programs, tracks, or certificate programs.

College/Unit(s) Submitting Proposal: College of Sciences **Proposed Effective Term/Year:** Fall 2010

Unit(s) Housing Program: Department of Mathematics

Name of Program and/or track: Mathematics PhD

Brief Statement of Program Change: (for suspensions or deletions of degree programs, tracks or certificates, please attach on a separate sheet the rationale for this action, including statement of how this action impacts faculty teaching in and students enrolled in the program, track or certificate. Please note the units that have been consulted if duplication of programs or conflict of interest with other units has occurred.)

Please check one: this action affects a: ■ Program ☐ Track ☐ Certificate

Please check one: this action is a(n): ☐ Addition ☐ Inactivation ☐ Deletion ☑ Revision
☐ Temporary Suspension of Admissions: Length of Suspension _____

Temporary suspension of admissions: the program will be removed from the online application. A notation will be entered in the graduate catalog indicating the length of the suspension of admissions.

Inactivation: the program will be removed from the online application. Admissions will be suspended to new students. A notation will be entered in the catalog to indicate that the program is being deleted. If students are currently in the program, the program will remain in the graduate catalog. Once the last students have graduated, the program will be removed from the catalog.

Deletions: the program will be removed from the online application. Admissions will be suspended to new students. A notation will be entered in the catalog to indicate that the program is being deleted. If students are currently in the program, the program will remain in the graduate catalog. Once the last students have graduated, the program will be removed from the catalog and deleted in all university records.

For program, track, or certificate additions or revisions:

1. **Will students be moved from an existing program or track into this new program or track?** ☐ Yes ◉ No
   If yes, state the name of the program or track where students are currently enrolled: _____
2. **Are you changing the name of an existing program or track?** ☐ Yes ◉ No
   If yes, provide the new name of the program or track: _____
   Provide the name of the current program or track: _____
   When is the name change effective? _____
   Please Note: A name change will be effective on all diplomas on the effective date of change. This may affect students currently enrolled or those newly admitted.
3. **Are you requesting a CIP Code change?** ☐ Yes ◉ No
   If yes, old CIP _____ new CIP _____
4. **A "marked up" catalog copy MUST be included showing the changes for the existing description.**

For program, track, and certificate inactivation or deletions:

1. **Are students currently enrolled in the program?** ☐ Yes ☐ No
2. **If yes, attach a "teach out" plan for all current students specifying how they can finish the program or where students will be placed if being moved to another program. The " teach out" plan should specify when courses will be offered to enable students to finish.**

RECOMMENDATIONS

☒ Yes ☐ No
Department Chair: _____ **Date:** 11/20/09

☒ Yes ☐ No
College Curriculum Committee Chair: _____ **Date:** 11/20/09

☒ Yes ☐ No
College Dean or Unit Head: _____ **Date:** 11/20/09

☐ Yes ☐ No
Chair, UPCC or GSC: _____ **Date:** _____

☐ Yes ☐ No
Dean, Undergraduate Studies or Graduate Studies: _____ **Date:** _____

Approval:

Provost: _____ **Date:** _____

Distribution: After approval is received from the Provost, distribution will be to:

- ☒ Department(s)
- ☒ College
- ☒ Registrar
- ☒ Associate Registrar
- ☒ Institutional Research
- ☒ Academic Services
- ☒ Faculty Senate
- ☒ Information, Analysis & Assessment

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Unit(s) Housing Program: Department of Mathematics

Name of Program and/or track: Mathematical Science MS

Brief Statement of Program Change: (for suspensions or deletions of degree programs, tracks or certificates, please attach on a separate sheet the rationale for this action, including statement of how this action impacts faculty teaching in and students enrolled in the program, track or certificate. Please note the units that have been consulted if duplication of programs or conflict of interest with other units has occurred.)

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Please check one: this action is a(n): ☐ Addition ☐ Inactivation ☐ Deletion ■ Revision
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   If yes, state the name of the program or track where students are currently enrolled: _____
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   If yes, provide the new name of the program or track: _____
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   When is the name change effective? _____
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3. **Are you requesting a CIP Code change?** ☐ Yes ■ No
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1. **Are students currently enrolled in the program?** ☐ Yes ☐ No
2. **If yes, attach a "teach out" plan for all current students specifying how they can finish the program or where students will be placed if being moved to another program. The " teach out" plan should specify when courses will be offered to enable students to finish.**

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Department Chair: _____ **Date:** 11/20/09

☒ Yes ☐ No
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Chair, UPCC or GSC: _____ **Date:** _____

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Dean, Undergraduate Studies or Graduate Studies: _____ **Date:** _____

Approval:

Provost: _____ **Date:** _____

Distribution: After approval is received from the Provost, distribution will be to:

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Proposed modifications in our MS in Mathematical Sciences and Ph.D. in Mathematics Programs

Content

Rationale

The document below represents a new vision of our graduate program. In the program we have now, the MS and the Ph.D. are loosely connected and the organization of the program is rather complicated (the MS has a track and separate, individualized comprehensive examination requirements for non-thesis MS; the PhD has two sets of four qualifying examinations). For this reason, the program is somewhat hard to administer. Also, due to the discrepancies in the required courses in the MS and the Ph.D. programs, a student graduating with an MS degree (after two years of support in the case of a GTA/GRA), still may need another two years to finish the course work in order to take the qualifying examinations. This unnecessarily delays the research component of the program. Moreover, if a student with GTA/GRA fails the qualifiers, more than two years of departmental support is wasted.

The proposal is an attempt for the unification between the MS and the Ph.D. programs, the simplification of both, and the removal of the strict (and somewhat artificial) distinction between pure and applied tracks. The main idea is that all students (at M.S and Ph.D. levels) will take the core courses in their first year of studies. These courses include two computational courses, two basic analysis courses, one linear algebra course plus (for the Ph.D.) either a course in complex variables or in ordinary differential equations. We believe that those courses are basic and contain the material which appears frequently in many courses further taken by our students. A combined qualifying/comprehensive examination will be based on the core courses. Hence, students attempt their examination after the first year of study. A pass of the examination is classified in two levels: Ph.D. level or MS level. Students who pass the examination at the Ph.D. level have passed the Ph.D. qualifying exam, and are encouraged to proceed with selecting a dissertation advisor and committee. Students who pass the examination at the MS level have passed the MS comprehensive examination; this is required for the non-thesis option in the M.S. program. Any student who fails to pass the preliminary examination in two attempts will be dismissed from the graduate program.

Students will additionally be required to take one (for MS) or two (for PhD), two-semester course sequences, chosen in consultation with their advisor and (for thesis and dissertation

students) their committee. These advanced electives will be chosen to prepare students for a particular area of research. For Ph.D. students, to test their mastery and proficiency in the areas of their research, a written examination based on the two selected two-semester sequences will be given as part of their candidacy examinations. After the Ph.D. students pass the written part of the candidacy examination, they are required to pass an oral examination where students present a proposal of their research projects before their dissertation committee.

As a result, our graduate program will become much more streamlined and will be easier to administer; the time between entering the program and starting on research (which could be less than three semesters) will be considerably shortened; the role of a Ph.D. advisor and committee will be stressed at an earlier stage. All instructors who teach advanced graduate courses will be able to assume that students know the basic materials the core courses contain, and they will be spared of repeating any basic material as we have to do in many courses now. Since there is no requirement for a student to take advanced courses in any specific field, this plan can stay in place, even if the constitution of the department changes (faculty members in certain fields come and in the others leave) and new areas of mathematics emerge.

This proposal does not address the Industrial Mathematics Track in our MS program. The track is treated as a terminal degree program that is governed by separate rules.

Plan for implementation and assessment

We want to start the new program in fall 2010. To make a smooth transition, we have done and plan to do the following:

1. We have tried out the Analysis sequence in the fall 2008 and spring 2009 semesters. This helped us to find the appropriate amount of topics and the level and depth we can cover in this sequence. Since the purpose of the sequence is to help students in mastering the basic mathematical language that will make them more successful in their graduate study and research, we will provide extra help by supplying a Teaching Assistant for the course's grading and home work help sessions.

2. To get started in fall 2010 and spring 2011, we are prepared to offer the new courses as special topics courses if necessary.

3. At the end of the first two years of implementation of the new system proposed here, the Graduate Committee will conduct an assessment of the core courses, their impact on higher level courses and their impact on students' progress. One of the main measurements for assessment will be the rate of students who pass the preliminary examination.

Master of Science in Mathematical Sciences

Total Hours Required for M.S. – Minimum of 30 credit hours

There are two options for the master's degree: thesis and non-thesis. In either option, the master's program requires all students to complete the following five courses with B or better.

Required courses (15 credit hours)

MAS 5145 Advanced Linear Algebra and Matrix Theory (3hrs)
MAA 5xxx Analysis I (3hrs)
MAA 6xxx Analysis II (3hrs)
MAP 5711 Scientific Computing (3hrs)
MAP 6385 Applied Numerical Mathematics (3hrs)

It is expected that all these courses will be completed before more advanced mathematics courses. After completing the core courses, a student should establish an academic advisor for non-thesis M.S. option or a thesis/dissertation advisor and committee for thesis M.S. option and Ph.D.

A program of study must be established by the end of the second semester, and is presented to the graduate program coordinator for departmental approval. The program must include the completion of the core courses and one two-semester sequence. Sequences are pairs of related courses that give advanced knowledge in an area of mathematics. Each sequence must be approved by the thesis committee and the graduate program coordinator.

The following shows examples of acceptable sequences using current courses. We expect that other sequences will be developed as our program grows. Note that some sequences consist of a core course plus one elective while others consist of two electives. Thus the credit hours in this requirement are variable (3 to 6 credit hours).

Two-semester sequences

MAP 6407 Applied Mathematics I (3hrs) / MAP 6408 Applied Mathematics II (3hrs)
MAA 6405 Complex Variables (3hrs) / MAA 6404 Complex Analysis (3hrs)
MAD 6309 Advanced Graph Theory I (3hrs) / MAD 5205 Combinatorics & Graph Theory II (3hrs)
MAS 5145 Advanced Linear Algebra and Matrix Theory (3hrs) / MAS 5311 Abstract Algebra with Applications
MAP 5336 Ordinary Differential Equations and Applications (3hrs) / MAP 6356 Partial Differential Equations (3hrs)
MAA 6238 Measure and Probability (3hrs) / MAP 6111 Mathematical Statistics (3hrs)
MAA 6306 Real Analysis (3hrs) / MAA 6506 Functional Analysis (3hrs)

A list of other electives can be obtained from the graduate program coordinator. Approved graduate courses outside the department may also be used. At least one-half of the program courses must be taken at the 6000 level.

Thesis Option

In this option, the MS degree requires a total of at least 30 credit hours composed of at least 24 credit hours of course work and 6 credit hours of thesis. This includes the 15 credit hours of the core courses and 3 to 6 hours of a two-course sequence. No more than 6 credit hours of independent study or directed research may be credited toward the degree. An oral defense of the thesis will be required. It is strongly recommended that the student select a thesis advisor and establish a program of study by the completion of the core courses. With the help of a thesis advisor, the student will need to form a thesis committee of three members of which at least two must be from the Department of Mathematics. The committee must be approved by the Dean of the College of Sciences. All committee members must be graduate faculty.

Non-thesis Option

In this option, the student takes 30 credit hours of course work with at least 21 credit hours in the Department of Mathematics. This includes the 15 credit hours of the core courses and 3 to 6 credit hours in a two-semester course sequence. At most 9 credit hours can be taken as non-Mathematics department courses. No more than 3 credit hours of independent study may be credited toward the degree. It is strongly recommended that the student select an academic advisor and establish a program of study by the completion of the core courses. In addition, the student must pass a comprehensive examination (by passing the qualifying/comprehensive examination at or above the MS level) based on the core courses. Two attempts at the examination are permitted. A subcommittee of the Graduate Committee will be responsible for making and grading such examinations.

Doctor of Philosophy in Mathematics

Total Hours Required for Ph.D.—Minimum of 75 credit hours beyond the bachelor's degree; minimum of 45 credit hours beyond the master's degree

The Doctor of Philosophy (Ph.D.) program consists of at least 75 credit hours, of which a minimum of 15 credit hours are required for the dissertation. In addition to the dissertation hours, the program requirements include 18 credit hours of core courses and 6 to 12 credit hours in two two-semester sequences. The remaining 30 to 36 credit hours consist of additional dissertation research (7980 or 7919), at least 15 credit hours of regular classroom elective courses, and at most 12 hours of independent study or directed research. Electives require the approval of the advisor and the graduate program coordinator; up to 12 credit hours may be taken outside the department. At least one-half of the courses in the program of study must be taken at the 6000 level.

All students are required to complete the following courses with B or better.

Required courses (18 credit hours)

MAA 5XXX Analysis I
MAA 6XXX Analysis II
MAT 5711 Scientific Computing
MAP 6385 Applied Numerical Mathematics
MAS 5145 Advanced Linear Algebra and Matrix Theory
MAP 5336 Ordinary Differential Equations with Applications or MAA 6405 Complex Variables

After completing the core courses a student should establish a dissertation advisor and committee. A program of study must be established by the end of the second semester, and presented to the graduate program coordinator for departmental approval**.**

In addition to the core courses, all students must complete two two-semester sequences with B or better. Sequences are pairs of related courses that give advanced knowledge in an area of mathematics.

Each sequence must be approved by the dissertation advisor, dissertation committee, and the graduate program coordinator. The following shows examples of acceptable sequences using current courses. We expect that other sequences will be developed as our program grows. Note that some sequences consist of a core course plus one elective while others consist of two electives. Thus the credit hours in this requirement are variable (6 to 12 credit hours). A written examination on two such sequences will be required as part of the candidacy examination (see more details in Candidacy Examination section).

Two-semester sequences samples:

MAP 6407 Applied Mathematics I / MAP 6408 Applied Mathematics II
MAA 6405 Complex Variables / MAA 6404 Complex Analysis
MAD 6309 Adv Graph Theory I / MAD 5205 Combinatorics & Graph Theory II
MAS 5145 Adv Linear Algebra & Matrix Theory / MAS 5311 Abstract Algebra with Applications
MAP 5336 Ordinary Differential Equations with Applications / MAP 6356 Partial Differential Equations
MAA 6238 Measure and Probability / MAP 6111 Mathematical Statistics
MAA 6306 Real Analysis / MAA 6506 Functional Analysis

Examinations

A prospective doctoral student has to pass the following examinations:

- Qualifying Examination
- Candidacy Examination
- Dissertation Defense

Ph.D. Qualifying Examination

The qualifying/comprehensive examination is based on the core course work. To continue in the Ph.D. program students must pass the examination at the Ph.D. level. Two attempts are permitted. The examination will be administered twice a year: one before the Fall semester and one in the Spring semester. To take the examination, students must have earned a B or better in each core course, must have a minimum grade point average of 3.0 (out of 4.0) in the program, and must obtain permission from the graduate program coordinator. Students will normally take the examination after the first year and are expected to have passed it by the end of the second year of study unless a written request for a postponement has been approved by the Graduate Committee at least two months before the examination date.

Incoming qualified students are encouraged to take the qualifying/comprehensive examination when they arrive. A failure to pass the exam on this attempt will not be counted toward the specified two attempts. New students who pass the exam may be exempted from the requirement of taking some or all of the core courses pending the Graduate Committee's approval.

A committee formed (selected) by the Graduate Committee will be responsible for preparing and grading such examinations.

Dissertation Committee

It is strongly recommended that the student select a dissertation advisor by the completion of 18 credit hours of course work, and it is strongly recommended that the student works with the dissertation advisor to form a dissertation committee within two semesters of passing the Qualifying Examination. With the approval of the Dean of the College of Science, the dissertation committee must consist of a minimum of four members: three must be faculty members from the Department of Mathematics, and one must be at large from outside the Mathematics faculty. Committee chairs must be members of the graduate faculty. An off-campus expert may serve as the outside-the-college member. The Graduate Committee may specify additional membership. With approval from the Chairperson and the graduate program coordinator, two professors may co-chair the committee. Off-campus experts and adjunct faculty may not serve as chairs, although they may serve as co-chairs.

Candidacy Examination

The Candidacy Examination includes two parts.

Part 1: a written examination based on the materials from two of the selected two-semester sequence courses taken by the students beyond the core courses. A committee formed or selected by the Graduate Committee is responsible for preparing and grading the written examinations, which will be administered during the same time as the qualifying/candidacy examinations.

Part 2: an oral examination administered by the student's dissertation committee and based on the student's research proposal.

After passing both parts of the candidacy examination, the student can register for Doctoral Dissertation (MAP 7980 or MAA7980). A minimum of 15 Doctoral Dissertation credit hours are required. The written part of the Candidacy Examination can be attempted after passing the qualifying examination and the oral examination can be taken anytime after passing the written part of the examination; both parts of the Candidacy Examination must be completed within three years following the pass of qualifying examination. A student must successfully pass the Candidacy Examination within at most two attempts in each part.

Dissertation Defense

Upon completion of a student's research, the student's dissertation committee will schedule an oral defense of the dissertation. All members vote on acceptance or rejection of the final dissertation. The final dissertation must be approved by a majority of the dissertation committee. The student has seven years from the date of admission to the doctoral program to complete the dissertation.

Logistics

The required core courses and a number of two-semester sequences will be offered every year. Some two-semester sequences start in Fall and others in Spring. Other elective courses may be offered once every two years. For example, twelve of the graduate courses offered each semester can be scheduled as follows. In recent years the department has typically offered 10 to 12 graduate courses per semester.

Fall	**Spring**	**Fall**	**Spring**
Analysis I	Analysis II	Analysis I	Analysis II
Scientific Computing (part I)	Applied Numerical Math (part II)	Scientific Computing (part I)	Applied Numerical Math (part II)
Linear Algebra (part I)	Abstract Algebra (part II)	Linear Algebra (part I)	Abstract Algebra (part II)
Complex Analysis (part II)	Complex Variables (part I)	Complex Analysis (part II)	Complex Variables (part I)
PDE (part II)	ODE (part I)	PDE (part II)	ODE (part I)
Math Stat (part II)	Probability (part I)	Math Stat (part II)	Probability (part I)
Applied Math I	Applied Math II	Applied Math I	Applied Math II
Real Analysis (part I)	Functional Analysis (part II)	Real Analysis (part I)	Functional Analysis (part II)
Combinatorics (part II)	Adv. Graph Theory (part I)	Combinatorics (part II)	Adv. Graph Theory (part I)
Advanced Transforms (part I)	Tomography (part II)	Approximation Theory (part I)	Splines and Data Fitting (part II)
Optimization	Asymptotic Methods in Stat.	Wavelets	Hilbert Spaces
Math Modeling	Numerical PDE	Linear and Nonlinear Wave	Special Functions

This will provide flexibility for students in their course work.

Short Description of the Proposed Core Courses

The topics and textbooks for the required core courses could be changed only with the approval of the Graduate Committee.

MAS 5145 Advanced Linear Algebra and Matrix Theory: (Existing, revised) *Linear spaces, subspaces, linear transformations, matrices, eigenvalues and eigenvectors, Jordan forms, positive definite matrices, bilinear and quadratic forms, functions of matrices.*

Suggested Textbooks:
Shilov: Linear Algebra, Dover, 1977.
Greub: Linear Algebra, Springer, 1985.
Kostrikin and Manin, Linear Algebra and Geometry, Gordon and Breach, 1997.
Roman, Advanced Linear Algebra, Springer 2007.

MAP 5711 Scientific Computing: (Existing, revised) *Matlab fundamentals, computer arithmetic, nonlinear equations, polynomial interpolation, divided differences, splines, curve fitting, least-squares method, numerical differentiation and Integration.*

Suggested Textbooks:
Kincaid & Cheney: Numerical Analysis: *Mathematics of Scientific Computing,* Brooks/Cole, 2002.
Chapra: *Applied Numerical Methods with Matlab*, McGraw Hill, 2007.

MAP 6385 Applied Numerical Mathematics: (Existing, revised) *Solution of linear systems, numerical linear algebra, numerical solution of ordinary differential equations, numerical partial differential equations.*

Suggested Textbooks:
Kincaid & Cheney: Numerical Analysis: *Mathematics of Scientific Computing,* Brooks/Cole, 2002.
Chapra: *Applied Numerical Methods with Matlab*, McGraw Hill, 2007.

MAA 5XXX Analysis I: (New) *Real numbers, limits, differentiation, Riemann integrals, Riemann-Stieltjes integrals, calculus in Rn, metric and normed spaces, contraction mapping theorem, inverse and implicit functions.*

Suggested Textbooks:
Korner: A Companion to Analysis, AMS, 2003
Hunter & Nachtergaele: Applied Analysis (second edition), World Scientific, 2001.

MAA 6XXX Analysis II: (New) *Topological Spaces, Banach Spaces, Hilbert Spaces, Bounded Linear Operators, Distribution and Fourier Transform, Measure Theory and Function Spaces.*

Suggested Textbooks:
Hunter & Nachtergaele: Applied Analysis (second edition), World Scientific, 2001.

Korner: A Companion to Analysis, AMS, 2005.

MAP 5336 Ordinary Differential Equations and Applications: (Existing, revised) *Existence and uniqueness of solutions of differential equations, system of ordinary differential equations, autonomous systems, phase plane analysis, stability, bifurcations.*

Suggested Textbook:
Grimshaw: Nonlinear Ordinary Differential Equations, Taylor/CRC Press, 1990.

MAA 6405 Complex Variables: (Existing, revised) *Complex plane, analytic functions, harmonic functions, Cauchy's theorem and integral formula, maximum modulus principle, Laurent series, singularities, the residue theorem.*

Suggested Textbooks:
Saff and Snider: Fundamentals of Complex Analysis (third edition), Prentice Hall, 2002.
Conway: Functions of One Complex Variable (second edition), Springer-Verlag, 1978.

Mathematics PhD

College : Sciences	**Degree** : PhD
Department : Mathematics	**Option** : Dissertation
Program Websites : http://www.math.ucf.edu/grad/gradinfo.shtml	

PROGRAM DESCRIPTION

The Doctor of Philosophy degree in Mathematics is intended to provide a broad base in applied and industrial mathematics. The goal of the program is to produce students who will attain distinction in their fields of research. In order to achieve this, the program has required core courses as well as a set of electives providing cross-disciplinary subjects. All students are required to take electives outside the department.

Students in the program can specialize in one of many aspects of mathematics, including propagation through random media, nonlinear waves, graph theory, operator algebra and frame theory, tomography, approximation theory, differential equations, nonlinear dynamics and mathematical physics, as well as abstract algebra, real and complex analysis, and probability theory. Responding to this wide variety of interests, the program offers flexibility in the composition of the core courses as well as the qualifying examination. The program is comprehensive with opportunities for students to pursue research in a variety of disciplines.

Faculty research interests include: applied analysis, differential equations, methods of mathematical physics, nonlinear waves, probability and mathematical statistics, functional analysis, numerical analysis, approximation theory, nonlinear dynamics, fluid mechanics, wave propagation, algebra, number theory, combinatorics and graph theory, inverse problems, special functions and orthogonal polynomials, financial mathematics, and medical imaging.

CURRICULUM

The Mathematics PhD program consists of at least 75 credit hours of course work beyond the bachelor's degree, of which a minimum of 27 hours of formal course work, exclusive of independent study, and 15 credit hours of dissertation research (7980) are required. The program requires 18 credit hours of core courses, and the remainder of the program may be composed of electives and independent study courses. No more than 12 credit hours of independent study or independent directed research may be credited toward the degree. At least one-half of the program courses must be taken at the 6000 level.

Total Credit Hours Required:
75 Credit Hours Minimum beyond the Bachelor's Degree

Electives are chosen in consultation with the student's advisory committee and may be chosen from the suggested options: Discrete Mathematics, General Applied Mathematics, Mathematical Computer Tomography, Image Processing and Computer Graphics, Mathematical Finance, Mathematical Optics, Mathematical Physics, Pure Mathematics, Rational Mechanics, Signal Analysis, and Mathematical Statistics. A list of elective course options can be obtained from the graduate program coordinator. If a student takes MAP 4363 (Applied Boundary Value Problems I) previously as part of an undergraduate program, then MAP 5435 (Advanced Mathematics for Engineers) cannot be applied toward the graduate program of study, but another alternative can be taken.

Courses taken outside the Mathematics department must be approved by the adviser or graduate coordinator. These courses are selected in consultation with the student's advisory committee.

Required Courses—18 Credit Hours

Students must take six of the following courses. The choices must be approved by the graduate program director.

- MAA 6405 Complex Variables (3 credit hours)
- MAA 6416 Topology (3 credit hours)
- MAA 6404 Complex Analysis (3 credit hours)
- MAA 6506 Functional Analysis (3 credit hours)
- MAP 5336 Ordinary Differential Equations and Applications (3 credit hours)
- MAP 6407 Applied Mathematics I (3 credit hours)
- MAA 6238 Measure and Probability (3 credit hours)
- MAP 6356 Partial Differential Equations (3 credit hours)
- MAP 6408 Applied Mathematics II (3 credit hours)
- MAA 5210 Topics in Advanced Calculus (3 credit hours)
- MAS 5311 Abstract Algebra with Applications (3 credit hours)

Elective Courses—42 Credit Hours

At least 9 hours of course work here must be formal course work, exclusive of independent study.

Dissertation—15 Credit Hours Minimum

- XXXX 7980 Dissertation Research (15 credit hours minimum)

Qualifying Examination

The qualifying examination is a written examination administered twice a year. Students obtain permission from the graduate program director to take the examination. Students normally start taking this exam at the end of the first year and are expected to have completed the exam by the end of the second year unless a written request for a postponement has been approved by the Graduate Committee at least two months prior to the examination date. To be eligible to take the PhD Qualifying Examination, the student must have a minimum grade point average of 3.0 (out of 4.0) in all post-baccalaureate work.

Depending on the choice of core courses, students choose to complete qualifying exams in either of the following two groups of courses:

- MAA 6404 Complex Analysis (3 credit hours)
- MAA 6416 Topology (3 credit hours)
- MAA 6506 Functional Analysis (3 credit hours)
- MAS 5311 Abstract Algebra with Applications (3 credit hours)

Or

- MAA 6405 Complex Variables (3 credit hours)
- MAP 5336 Ordinary Differential Equations and Applications (3 credit hours)
- MAP 6407 Applied Mathematics I (3 credit hours)
- MAP 6356 Partial Differential Equations (3 credit hours)

After passing the qualifying exam, the student must select a dissertation adviser. Finding a dissertation adviser is the student's responsibility and should be done as soon as possible. The student forms an advisory committee in consultation with the dissertation adviser. The dissertation adviser is the chair of the student's advisory committee. This committee approves a plan of study for the doctoral student which should be completed in the third major term and must be completed by candidacy.

Candidacy Examination

The candidacy examination is administered by the student's committee and tailored to the student's individual program. It can be attempted anytime after passing the qualifying examination, and after the student has begun research but prior to the end of the second year following the qualifying examination. Students should submit a petition to the Mathematics PhD graduate program committee to request an extension if they will not attempt the candidacy examination within two years of taking the qualifying examination. The candidacy examination cannot be taken more than two times.

Dissertation Defense

Upon completion of a student's research, the student's committee schedules an oral defense of the dissertation. Most students complete the program within five years after obtaining their bachelor's degree. Students are expected to complete the dissertation in no more than seven years from the date of admission to the program.

INDEPENDENT LEARNING

The required 15 credit hours of dissertation will provide ample opportunities for students to gain the independent learning experience through studying published research papers and deriving, on their own, new and meaningful research results.

APPLICATION REQUIREMENTS

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online. All requested materials must be submitted by the established deadline(s).

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- Official, competitive GRE score, taken in the last five years.
- Three letters of recommendation.
- Goal statement.
- Résumé.

Meeting minimum UCF admission criteria does not guarantee program admission. Final admission is based on evaluation of the applicant's abilities, past performance, recommendations, match of the program and faculty expertise to the applicant's career/academic goals, and the applicant's potential for completing the degree.

Transfer of credits from other programs will be considered on a course-by-course basis. Additionally, students entering the graduate program with regular status are assumed to have a working knowledge of undergraduate calculus, differential equations, linear algebra (or matrix theory), boundary value problems, statistics, computer programming, and maturity in the language of advanced calculus (at the level of MAA 4226). Students who are not adequately prepared in one or more of these areas can select appropriate courses from the undergraduate curriculum to make up such deficiencies. Such courses, unless specially approved, do not count toward the graduate degree. Applicants not qualified for regular status may initially be admitted to the university in nondegree-seeking status, although only nine hours in this status are transferrable into a graduate program.

Application Deadlines

Mathematics PhD	Fall Priority	Fall	Spring	Summer
Domestic Applicants	Jan 15	Jul 15	Dec 1	Apr 15
International Applicants	Jan 15	Jan 15	Jul 1	Nov 1
International Transfer Applicants	Jan 15	Mar 1	Sep 1	Dec 15

FINANCIALS

Graduate students may receive financial assistance through fellowships, assistantships, tuition support, or loans. For more information, see Student Finances, which describes the types of financial assistance available at UCF and provides general guidance in planning your graduate finances. The Financial Information section of the Graduate Catalog is another key resource.

Fellowships

Fellowships are awarded based on academic merit to highly qualified students. They are paid to students through the Office of Student Financial Assistance, based on instructions provided by the College of Graduate Studies. Fellowships are given to support a student's graduate study and do not have a work obligation. For more information, see Fellowships, which includes descriptions of UCF fellowships and what you should do to be considered for a fellowship.

Proposed UCF Ph.D. Graduate Catalog Description

College : Sciences Degree : PhD
Department : Mathematics Option : Dissertation
Program Websites : http://www.math.ucf.edu/grad/gradinfo.shtml

PROGRAM DESCRIPTION

The Doctor of Philosophy degree in Mathematics is intended to provide a broad base in applied and industrial mathematics. The goal of the program is to produce students who will attain distinction in their fields of research. In order to achieve this, the program has required core courses as well as a set of electives providing cross-disciplinary subjects. All students are required to take electives outside the department.

Students in the program can specialize in one of many aspects of mathematics, including propagation through random media, nonlinear waves, graph theory, operator algebra and frame theory, tomography, approximation theory, differential equations, nonlinear dynamics and mathematical physics, as well as abstract algebra, real and complex analysis, and probability theory. Responding to this wide variety of interests, the program offers flexibility in the composition of the core courses as well as the qualifying examination. The program is comprehensive with opportunities for students to pursue research in a variety of disciplines.

Faculty research interests include: applied analysis, differential equations, methods of mathematical physics, nonlinear waves, probability and mathematical statistics, functional analysis, numerical analysis, approximation theory, nonlinear dynamics, fluid mechanics, wave propagation, algebra, number theory, combinatorics and graph theory, inverse problems, special functions and orthogonal polynomials, financial mathematics, and medical imaging.

Read More

CURRICULUM

The Mathematics PhD program consists of at least 75 credit hours of course work beyond the bachelor's degree, of which a minimum of 39 hours of formal course work, exclusive of independent study, and 15 credit hours of dissertation research (7980) are required. The program requires 18 credit hours of core courses and 6 to 12 credit hours in two two-semester sequences. The remaining 30 to 36 credit hours consist of additional dissertation research (7980 or 7919), at least 15 credit hours of regular classroom elective courses, and at most 12 credit hours of independent study or independent directed research. Electives require the approval of the advisor and the graduate program coordinator; up to 12 credit hours may be taken outside the department. At least one-half of the program courses must be taken at the 6000 level.

Total Credit Hours Required:

75 Credit Hours Minimum beyond the Bachelor's Degree

Required Courses—18 Credit Hours

All students are required to complete the following courses with B or better.

- MAA 5xxx Analysis I (3 credit hours)
- MAA 6xxx Analysis II (3 credit hours)
- MAT 5711 Scientific Computing (3 credit hours)
- MAP 6385 Applied Numerical Mathematics (3 credit hours)
- MAS 5145 Advanced Linear Algebra and Matrix Theory (3 credit hours)
- MAA 6405 Complex Variables (3 credit hours)
  or MAP 5336 Ordinary Differential Equations and Applications (3 credit hours)

Elective Courses—42 Credit Hours

At least 21 hours of course work here must be formal course work, exclusive of independent study.

Restricted Electives (6-12 credit hours)

All students are required to complete two two-semester sequences. Sequences are pairs of related courses that give advanced knowledge in an area of mathematics.

Each sequence must be approved by the dissertation advisor, dissertation committee, and the graduate program coordinator. The following shows examples of acceptable sequences using current courses. We expect that other sequences will be developed as our program grows. Note that some sequences consist of a core course plus one elective while others consist of two electives. Thus the credit hours in this requirement are variable (6 to 12 credit hours). A written examination on two such sequences will be required as part of the candidacy examination (see more details in Candidacy Examination section).

- MAP 6407 Applied Mathematics I / MAP 6408 Applied Mathematics II
- MAA 6405 Complex Variables / MAA 6404 Complex Analysis
- MAD 6309 Adv Graph Theory I / MAD 5205 Combinatorics & Graph Theory II
- MAS 5145 Adv Linear Algebra & Matrix Theory / MAS 5311 Abstract Algebra with Applications
- MAP 5336 Ordinary Differential Equations with Applications / MAP 6356 Partial Differential Equations
- MAA 6238 Measure and Probability / MAP 6111 Mathematical Statistics
- MAA 6306 Real Analysis / MAA 6506 Functional Analysis

Unrestricted Electives (30-36 credit hours)

Electives are chosen in consultation with the student's advisory committee and may be chosen from the suggested options: Discrete Mathematics, General Applied Mathematics, Mathematical Computer Tomography, Image Processing and Computer Graphics, Mathematical Finance, Mathematical Optics, Mathematical Physics, Pure Mathematics, Rational Mechanics, Signal Analysis, and Mathematical Statistics. A list of elective course options can be obtained from the graduate program coordinator. If a student takes MAP 4363 (Applied Boundary Value Problems I) previously as part of an undergraduate program, then MAP 5435 (Advanced Mathematics for Engineers) cannot be applied toward the graduate program of study, but another alternative can be taken.

Courses taken outside the Mathematics department must be approved by the adviser and graduate coordinator. These courses are selected in consultation with the student's advisory committee.

Dissertation—15 Credit Hours Minimum

- XXX 7980 Dissertation Research (15 credit hours minimum)

Qualifying Examination

The qualifying/comprehensive examination is based on the core course work. To continue in the Ph.D. program students must pass the examination at the Ph.D. level. Two attempts are permitted. The examination will be administered twice a year: one before the Fall semester and one in the Spring semester. To take the examination, students must have earned a B or better in each core course, must have a minimum grade point average of 3.0 (out of 4.0) in the program, and must obtain permission from the graduate program coordinator. Students will normally take the examination after the first year and are expected to have passed it by the end of the second year of study unless a written request for a postponement has been approved by the Graduate Committee at least two months before the examination date.

It is strongly recommended that the student select a dissertation advisor by the completion of 18 credit hours of course work, and it is strongly recommended that the student works with the dissertation advisor to form a dissertation committee within two semesters of passing the Qualifying Examination.

Candidacy Examination

The Candidacy Examination includes two parts.

Part 1: a written examination based on the materials from two of the selected two-semester sequence courses taken by the students beyond the core courses. A committee formed or selected by the Graduate Committee is responsible for preparing and grading the written examinations, which will be administered during the same time as the qualifying/candidacy examinations.

Part 2: an oral examination administered by the student's dissertation committee and based on the student's research proposal.

After passing both parts of the candidacy examination, the student can register for Doctoral Dissertation (MAP 7980 or MAA7980). A minimum of 15 Doctoral Dissertation credit hours are required. The written part of the Candidacy Examination can be attempted after passing the qualifying examination and the oral examination can be taken anytime after passing the written part of the examination; both parts of the Candidacy Examination must be completed within three years following the pass of qualifying examination. A student must successfully pass the Candidacy Examination within at most two attempts in each part.

Dissertation Defense

Upon completion of a student's research, the student's committee schedules an oral defense of the dissertation. Most students complete the program within five years after obtaining their bachelor's degree. Students are expected to complete the dissertation in no more than seven years from the date of admission to the program.

INDEPENDENT LEARNING

The required 15 credit hours of dissertation will provide ample opportunities for students to gain the independent learning experience through studying published research papers and deriving, on their own, new and meaningful research results.

Application Requirements

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online. All requested materials must be submitted by the established deadline(s).

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- Official, competitive GRE score, taken in the last five years.
- Three letters of recommendation.
- Goal statement.
- Résumé.

Meeting minimum UCF admission criteria does not guarantee program admission. Final admission is based on evaluation of the applicant's abilities, past performance, recommendations, match of the program and faculty expertise to the applicant's career/academic goals, and the applicant's potential for completing the degree.

Transfer of credits from other programs will be considered on a course-by-course basis. Additionally, students entering the graduate program with regular status are assumed to have a

working knowledge of undergraduate calculus, differential equations, linear algebra (or matrix theory), boundary value problems, statistics, computer programming, and maturity in the language of mathematical proofs. Students who are not adequately prepared in one or more of these areas can select appropriate courses from the undergraduate curriculum to make up such deficiencies. Such courses, unless specially approved, do not count toward the graduate degree. Applicants not qualified for regular status may initially be admitted to the university in nondegree-seeking status, although only nine hours in this status are transferrable into a graduate program.

Application Deadlines

Mathematics PhD	Fall Priority	Fall	Spring	Summer
Domestic Applicants	Jan 15	Jul 15	Dec 1	Apr 15
International Applicants	Jan 15	Jan 15	Jul 1	Nov 1
International Transfer Applicants	Jan 15	Mar 1	Sep 1	Dec 15

FINANCIALS

Graduate students may receive financial assistance through fellowships, assistantships, tuition support, or loans. For more information, see Student Finances, which describes the types of financial assistance available at UCF and provides general guidance in planning your graduate finances. The Financial Information section of the Graduate Catalog is another key resource.

Fellowships

Fellowships are awarded based on academic merit to highly qualified students. They are paid to students through the Office of Student Financial Assistance, based on instructions provided by the College of Graduate Studies. Fellowships are given to support a student's graduate study and do not have a work obligation. For more information, see Fellowships, which includes descriptions of UCF fellowships and what you should do to be considered for a fellowship.

Mathematical Science MS

Program TRACKS

Industrial Mathematics

College : Sciences	**Degree** : MS
Department : Mathematics	**Option** : Thesis, Nonthesis
Program Websites : http://math.ucf.edu/	

PROGRAM DESCRIPTION

The Master of Science in Mathematical Science provides a broad base in applied and industrial mathematics. Research interests of the faculty include applied analysis, differential equations, methods of mathematical physics, nonlinear waves, probability and mathematical statistics, functional analysis, numerical analysis, approximation theory, nonlinear dynamics, fluid mechanics, wave propagation, algebra, number theory, combinatorics and graph theory, inverse problems, special functions and orthogonal polynomials, financial mathematics, and medical imaging.

CURRICULUM

The Mathematical Science MS program requires 30 credit hours minimum beyond the bachelor's degree for the thesis option and 36 credit hours minimum beyond the bachelor's degree for the nonthesis option.

Total Credit Hours Required:
30-36 Credit Hours Minimum beyond the Bachelor's Degree

Thesis and nonthesis options are offered within the program. In both options students must find an adviser who participates in designing a program of study. A program of study is presented to either the Graduate Curriculum Committee or the graduate program director for approval. In the thesis option, students complete a minimum of 30 credit hours composed of at least 18 credit hours of core foundation course work, 6 credit hours of electives, and 6 credit hours of thesis. In the nonthesis option, students complete 36 credit hours composed of 18 credit hours of core foundation courses and at least 18 credit hours of elective course work. In addition, students must pass a comprehensive written examination based on the program of study in the final semester of the student's program. At least one-half of the program courses in both options must be taken at the 6000 level.

Required Courses—18 Credit Hours

The list below is typical of the core foundation courses. It may vary dependent on the student's background and must be chosen with the program's approval.

- MAA 5210 Topics in Advanced Calculus (3 credit hours)
- MAA 6405 Complex Variables (3 credit hours)
- MAP 5336 Ordinary Differential Equations and Applications (3 credit hours)
- MAP 6385 Applied Numerical Mathematics (3 credit hours)
- MAP 6407 Applied Mathematics I (3 credit hours)
- MAS 5145 Advanced Linear Algebra and Matrix Theory (3 credit hours)

Elective Courses—6 Credit Hours

Electives should be chosen in consultation with the graduate program director or the student's thesis adviser and may be chosen from the suggested options: discrete mathematics, general applied mathematics, image processing and computer graphics, mathematical optics, mathematical physics, pure mathematics, rational mechanics, signal analysis, and statistics. A list of courses for these elective options can be obtained from the graduate program director. Approved graduate courses outside the department may also be used.

Thesis Option—6 Credit Hours

It is recommended that the thesis topic have potential for industrial applications. An oral defense of the thesis will be required. It is strongly recommended that the student select a thesis adviser by the completion of 18 semester hours of course work.

- MAP 6971 Thesis (6 credit hours)

Nonthesis Option—12 Credit Hours

Nonthesis students will take an additional 12 credit hours of electives. The electives should be chosen in consultation with the graduate program director or the student's adviser.

Nonthesis students will receive independent learning experiences by taking MAP 6407 Applied Mathematics I, where they apply mathematical principles to independent projects. Other courses that also have substantial research projects include MAP 5117 Mathematical Modeling, MAT 5711 Scientific Computing and MAP 6111 Mathematical Statistics, and may be taken as electives.

In addition to course work, the nonthesis student must pass a comprehensive written examination given in the final semester of the student's program, based on the program of study.

INDEPENDENT LEARNING

In the Mathematical Science MS program, the thesis option provides an independent learning experience through directed research, reading published research papers, and writing and defending the thesis. The nonthesis option requires students to take MAP 6407 Applied Mathematics I, where they apply mathematical principles to independent projects.

APPLICATION REQUIREMENTS

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online. All requested materials must be submitted by the established deadline(s).

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- Official, competitive GRE score taken within the last five years.
- A working knowledge of undergraduate calculus, differential equations, linear algebra (or matrix theory), boundary value problems, statistics, computer programming, and maturity in the language of advanced calculus (at the level of MAA 4226).

Students who find they are not adequately prepared in one or more of the required mathematical subject areas can select appropriate courses from the undergraduate curriculum to make up such deficiencies. Such courses, unless specially approved, will not count toward the graduate degree. Applicants not qualified for regular status may be admitted initially to the university in a nondegree-seeking status, although only nine hours in this status can be transferred into a graduate program.

Transfer of credits from other programs will be considered on a course-by-course basis.

Meeting minimum UCF admission criteria does not guarantee program admission. Final admission is based on evaluation of the applicant's abilities, past performance, recommendations, match of this program and faculty expertise to the applicant's career/academic goals, and the applicant's potential for completing the degree.

Application Deadlines

All application materials must be submitted by the appropriate deadline listed below.

Mathematical Science MS	Fall Priority	Fall	Spring	Summer
Domestic Applicants	Jan 15	Jul 15	Dec 1	Apr 15
International Applicants	Jan 15	Jan 15	Jul 1	Nov 1
International Transfer Applicants	Jan 15	Mar 1	Sep 1	Dec 15

FINANCIALS

Graduate students may receive financial assistance through fellowships, assistantships, tuition support, or loans. For more information, see Student Finances, which describes the types of financial assistance available at UCF and provides general guidance in planning your graduate finances. The Financial Information section of the Graduate Catalog is another key resource.

Fellowships

Fellowships are awarded based on academic merit to highly qualified students. They are paid to students through the Office of Student Financial Assistance, based on instructions provided by the College of Graduate Studies. Fellowships are given to support a student's graduate study and do not have a work obligation. For more information, see Fellowships, which includes descriptions of UCF fellowships and what you should do to be considered for a fellowship.

Contact INFO

Graduate Program

Xin Li PhD
Professor
xli@math.ucf.edu
Telephone: 407-823-5984
Math and Physics 212 Map

Graduate Admissions

Graduate Admissions Counselor
gradadmissions@mail.ucf.edu
Telephone: 407-823-2766 ext. 251
Millican Hall 230 Map
Online Application
Graduate Admissions

Mailing Address

Proposed Graduate Catalog for Mathematics MS Program

College : Sciences Degree : MS
Department : Mathematics Option : Thesis, Nonthesis
Program Websites : http://math.ucf.edu/

PROGRAM DESCRIPTION

The Master of Science in Mathematical Science provides a broad base in applied and industrial mathematics. Research interests of the faculty include applied analysis, differential equations, methods of mathematical physics, nonlinear waves, probability and mathematical statistics, functional analysis, numerical analysis, approximation theory, nonlinear dynamics, fluid mechanics, wave propagation, algebra, number theory, combinatorics and graph theory, inverse problems, special functions and orthogonal polynomials, financial mathematics, and medical imaging.

Read More

CURRICULUM

The Mathematical Science MS program requires 30 credit hours minimum beyond the bachelor's degree. There are two options for the master's degree: thesis and non-thesis.

Total Credit Hours Required:

30 Credit Hours Minimum beyond the Bachelor's Degree

Thesis and nonthesis options are offered within the program. In both options, after completing the core courses, a student must establish an academic advisor for non-thesis M.S. option or a thesis advisor and committee for thesis M.S. option. A program of study must be established by the end of the second semester, and is presented to the graduate program coordinator for departmental approval. The program must include the completion of the core courses and one two-semester sequence. At least one-half of the program courses must be taken at the 6000 level.

Required Courses—15 Credit Hours

In either option, the master's program requires all students to complete the following five courses with B or better.

- MAS 5145 Advanced Linear Algebra and Matrix Theory (3hrs)
- MAA 5xxx Analysis I (3hrs)
- MAA 6xxx Analysis II (3hrs)
- MAP 5711 Scientific Computing (3hrs)
- MAP 6385 Applied Numerical Mathematics (3hrs).

Elective Courses— 9 Credit Hours

Restricted Electives (3 – 6 credit hours)

After the completion of the core courses, the program requires all students to complete one of the following two-semester sequences. The following shows examples of acceptable sequences using current courses. We expect that other sequences will be developed as our program grows. Note that some sequences consist of a core course plus one elective while others consist of two electives. Thus the credit hours in this requirement are variable (3 to 6 credit hours).

- MAP 6407 Applied Mathematics I (3hrs) / MAP 6408 Applied Mathematics II (3hrs)
- MAA 6405 Complex Variables (3hrs) / MAA 6404 Complex Analysis (3hrs)
- MAD 6309 Advanced Graph Theory I (3hrs) / MAD 5205 Combinatorics & Graph Theory II (3hrs)
- MAS 5145 Advanced Linear Algebra and Matrix Theory (3hrs) / MAS 5311 Abstract Algebra with Applications
- MAP 5336 Ordinary Differential Equations and Applications (3hrs) / MAP 6356 Partial Differential Equations (3hrs)
- MAA 6238 Measure and Probability (3hrs) / MAP 6111 Mathematical Statistics (3hrs)
- MAA 6306 Real Analysis (3hrs) / MAA 6506 Functional Analysis (3hrs)

Unrestricted Electives (3-6 credit hours)

Unrestricted electives should be chosen in consultation with the graduate program director or the student's thesis adviser and may be chosen from the suggested options: discrete mathematics, general applied mathematics, image processing and computer graphics, mathematical optics, mathematical physics, pure mathematics, rational mechanics, signal analysis, and statistics. A list of courses for these elective options can be obtained from the graduate program director. Approved graduate courses outside the department may also be used.

Thesis Option—6 Credit Hours

In this option, the MS degree requires a total of at least 30 credit hours composed of at least 24 credit hours of course work and 6 credit hours of thesis. This includes the 15 credit hours of the core courses and 3 to 6 hours of a two-course sequence. No more than 6 credit hours of independent study or directed research may be credited toward the degree. It is strongly recommended that the student select a thesis advisor and establish a program of study by the completion of the core courses. With the help of a thesis advisor, the student will need to form a thesis committee of three members of which at least two must be from the Department of Mathematics.

It is recommended that the thesis topic have potential for industrial applications. An oral defense of the thesis will be required.

- MAP 6971 Thesis (6 credit hours)

Nonthesis Option—6 Credit Hours

Nonthesis students will take an additional 6 credit hours of unrestricted electives. The electives should be chosen in consultation with the graduate program director or the student's adviser.

Nonthesis students will receive independent learning experiences by taking one of the two-semester sequences, where they apply mathematical principles to independent projects. Other courses that also have substantial research projects include MAP 5117 Mathematical Modeling, MAT 5711 Scientific Computing and MAP 6111 Mathematical Statistics, and may be taken as electives.

No more than 3 credit hours of independent study may be credited toward the degree. It is strongly recommended that the student select an academic advisor and establish a program of study by the completion of the core courses. In addition, the student must pass a comprehensive examination (by passing the qualifying/comprehensive examination at or above the MS level) based on the core courses. Two attempts at the examination are permitted.

INDEPENDENT LEARNING

In the Mathematical Science MS program, the thesis option provides an independent learning experience through directed research, reading published research papers, and writing and defending the thesis. The nonthesis option requires students to take one of the two-semester sequences, where they apply mathematical principles to independent projects.

Application Requirements

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online. All requested materials must be submitted by the established deadline(s).

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- Official, competitive GRE score taken within the last five years.
- A working knowledge of undergraduate calculus, differential equations, linear algebra (or matrix theory), boundary value problems, statistics, computer programming, and maturity in the language of mathematical proofs.

Students who find they are not adequately prepared in one or more of the required mathematical subject areas can select appropriate courses from the undergraduate curriculum to make up such deficiencies. Such courses, unless specially approved, will not count toward the graduate degree. Applicants not qualified for regular status may be admitted initially to the university in a nondegree-seeking status, although only nine hours in this status can be transferred into a graduate program.

Transfer of credits from other programs will be considered on a course-by-course basis.

Meeting minimum UCF admission criteria does not guarantee program admission. Final admission is based on evaluation of the applicant's abilities, past performance, recommendations, match of this program and faculty expertise to the applicant's career/academic goals, and the applicant's potential for completing the degree.

Application Deadlines

All application materials must be submitted by the appropriate deadline listed below.

Mathematical Science MS	Fall Priority	Fall	Spring	Summer
Domestic Applicants	Jan 15	Jul 15	Dec 1	Apr 15
International Applicants	Jan 15	Jan 15	Jul 1	Nov 1
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UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

Program Recommendation Form

This form is to be used to revise, add, suspend, or delete degree programs, tracks, or certificate programs.

College/Unit(s) Submitting Proposal: College of Education **Proposed Effective Term/Year:** Summer 2010

Unit(s) Housing Program: Educational Research, Technology and Leadership

Name of Program and/or track: PhD in Education-Higher Education Track

Brief Statement of Program Change: (for suspensions or deletions of degree programs, tracks or certificates, please attach on a separate sheet the rationale for this action, including statement of how this action impacts faculty teaching in and students enrolled in the program, track or certificate. Please note the units that have been consulted if duplication of programs or conflict of interest with other units has occurred.)

Please check one: this action affects a: ☐ Program ■ Track ☐ Certificate

Please check one: this action is a(n): ☐ Addition ☐ Inactivation ☐ Deletion ■ Revision
☐ Temporary Suspension of Admissions: Length of Suspension _____

Temporary suspension of admissions: the program will be removed from the online application. A notation will be entered in the graduate catalog indicating the length of the suspension of admissions.

Inactivation: the program will be removed from the online application. Admissions will be suspended to new students. A notation will be entered in the catalog to indicate that the program is being deleted. If students are currently in the program, the program will remain in the graduate catalog. Once the last students have graduated, the program will be removed from the catalog.

Deletions: the program will be removed from the online application. Admissions will be suspended to new students. A notation will be entered in the catalog to indicate that the program is being deleted. If students are currently in the program, the program will remain in the graduate catalog. Once the last students have graduated, the program will be removed from the catalog and deleted in all university records.

For program, track, or certificate additions or revisions:

1. **Will students be moved from an existing program or track into this new program or track?** ☐ Yes ■ No
   If yes, state the name of the program or track where students are currently enrolled: _____
2. **Are you changing the name of an existing program or track?** ☐ Yes ■ No
   If yes, provide the new name of the program or track: _____
   Provide the name of the current program or track: _____
   When is the name change effective? _____
   Please Note: A name change will be effective on all diplomas on the effective date of change. This may affect students currently enrolled or those newly admitted.
3. **Are you requesting a CIP Code change?** ☐ Yes ■ No
   If yes, old CIP _____ new CIP _____
4. **A "marked up" catalog copy MUST be included showing the changes for the existing description.**

For program, track, and certificate inactivation or deletions:

1. **Are students currently enrolled in the program?** ☐ Yes ☐ No
2. **If yes, attach a "teach out" plan for all current students specifying how they can finish the program or where students will be placed if being moved to another program. The " teach out" plan should specify when courses will be offered to enable students to finish.**

RECOMMENDATIONS

☑ Yes ☐ No
Department Chair: Grant Hayes **Date:** 10/1/09

☑ Yes ☐ No
College Curriculum Committee Chair: Rosemary Tarry **Date:** 10/9/09

☑ Yes ☐ No
College Dean or Unit Head: Grant Hayes **Date:** 11/10/09

☐ Yes ☐ No
Chair, UPCC or GSC: _____ **Date:** _____

☐ Yes ☐ No
Dean, Undergraduate Studies or Graduate Studies: _____ **Date:** _____

Approval:

Provost: _____ **Date:** _____

Distribution: After approval is received from the Provost, distribution will be to:

☐ Department(s)	☐ Associate Registrar	☐ Faculty Senate
☐ College	☐ Institutional Research	☐ Information, Analysis & Assessment
☐ Registrar	☐ Academic Services	

College of Education
Department of Educational Research, Technology & Leadership (ERTL)
Revisions to Educational Ph.D. Higher Education Track (September 17, 2009)

Proposed Specialization Course Changes

Current	Proposed
All courses – 3 credit hours	**RATIONALE** On January 7, 2009, the UCF Curriculum Sub-Committee approved the Higher Education track in the Educational Leadership EdD. For the establishment of this new track in higher education, the Higher Education and Policy Studies (HEPS) faculty reviewed higher education programs and course offerings at U.S. universities to make the Higher Education track/s at UCF competitive and consonant with the best programs nationwide. The purpose of the proposed revisions to the Higher Education Track PhD is to update the Area of Specialization with the approved doctoral courses and new course numbers. Presently the Specialization courses listed under the PhD no longer exist, as these were eliminated when the new curricula was approved for the EdD. The intent of this proposal is not to propose a new course of study for the Higher Education PhD track but to align the PhD with the courses currently offered in HEPS.
Area of Specialization—18 Credit Hours Minimum	**Area of Specialization—18 Credit Hours Minimum**
	Replace with:
• EDH 7051 Educational Leadership in Higher Education • EDH 7056 Politics/Governance/Financing Higher Education • EDH 7408 Educational Personnel & Contract Negotiations • EDA 7236 Legal Issues in Higher Education • EDA 6540 Organization & Administration of Higher Education	• EDH 6632 American Professoriate and College Presidency • EDH 7401 Higher Education and Public Policy • EDH 7631 Managing Change, Conflict & Stability in Higher Education • EDH 7405 Legal Issues in Higher Education **(course renumbered)** • EDH 6540 Organization & Administration of Higher Education
	No change:
• EDH 6065 History and Philosophy of Higher Education	• EDH 6065 History and Philosophy of Higher Education

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

Program Recommendation Form

This form is to be used to revise, add, suspend, or delete degree programs, tracks, or certificate programs.

College/Unit(s) Submitting Proposal: College of Sciences **Proposed Effective Term/Year:** Fall 2010

Unit(s) Housing Program: Department of Mathematics

Name of Program and/or track: Mathematics PhD

Brief Statement of Program Change: (for suspensions or deletions of degree programs, tracks or certificates, please attach on a separate sheet the rationale for this action, including statement of how this action impacts faculty teaching in and students enrolled in the program, track or certificate. Please note the units that have been consulted if duplication of programs or conflict of interest with other units has occurred.)

Please check one: this action affects a: ☑ Program ☐ Track ☐ Certificate

Please check one: this action is a(n): ☐ Addition ☐ Inactivation ☐ Deletion ☑ Revision
☐ Temporary Suspension of Admissions: Length of Suspension _____

Temporary suspension of admissions: the program will be removed from the online application. A notation will be entered in the graduate catalog indicating the length of the suspension of admissions.

Inactivation: the program will be removed from the online application. Admissions will be suspended to new students. A notation will be entered in the catalog to indicate that the program is being deleted. If students are currently in the program, the program will remain in the graduate catalog. Once the last students have graduated, the program will be removed from the catalog.

Deletions: the program will be removed from the online application. Admissions will be suspended to new students. A notation will be entered in the catalog to indicate that the program is being deleted. If students are currently in the program, the program will remain in the graduate catalog. Once the last students have graduated, the program will be removed from the catalog and deleted in all university records.

For program, track, or certificate additions or revisions:

1. **Will students be moved from an existing program or track into this new program or track?** ☐ Yes ☐ No
   If yes, state the name of the program or track where students are currently enrolled: _____
2. **Are you changing the name of an existing program or track?** ☐ Yes ☐ No
   If yes, provide the new name of the program or track: _____
   Provide the name of the current program or track: _____
   When is the name change effective? _____
   Please Note: A name change will be effective on all diplomas on the effective date of change. This may affect students currently enrolled or those newly admitted.
3. **Are you requesting a CIP Code change?** ☐ Yes ☐ No
   If yes, old CIP _____ new CIP _____
4. **A "marked up" catalog copy MUST be included showing the changes for the existing description.**

For program, track, and certificate inactivation or deletions:

1. **Are students currently enrolled in the program?** ☐ Yes ☐ No
2. **If yes, attach a "teach out" plan for all current students specifying how they can finish the program or where students will be placed if being moved to another program. The " teach out" plan should specify when courses will be offered to enable students to finish.**

RECOMMENDATIONS

☑ Yes ☐ No
Department Chair: Grant Hays **Date:** 10/7/09

☑ Yes ☐ No
College Curriculum Committee Chair: Rosemary Taylor **Date:** 11/9/09

☑ Yes ☐ No
College Dean or Unit Head: Grant Hays **Date:** 11/10/09

☐ Yes ☐ No
Chair, UPCC or GSC: _____ **Date:** _____

☐ Yes ☐ No
Dean, Undergraduate Studies or Graduate Studies: _____ **Date:** _____

Approval:

Provost: _____ **Date:** _____

Distribution: After approval is received from the Provost, distribution will be to:

- ✓ ☐ Department(s)
- ✓ ☐ College
- ✓ ☐ Registrar
- ☐ Associate Registrar
- ☐ Institutional Research
- ☐ Academic Services
- ☐ Faculty Senate
- ☐ Information, Analysis & Assessment

Program Recommendation Form Attachment

Changing the Ed. D. in Educational Leadership to Executive Ed. D. in Educational Leadership

Statement of Program Change:

After analysis of the Ed. D. in Educational Leadership program enrollment and completion data, along with survey data gathered from past and current students, the educational leadership faculty collaborated to redesign the doctorate in educational leadership. Faculty aligned the new program, the Executive Ed. D. in Educational Leadership, with the Carnegie Initiative on the Education Doctorate and incorporated the most successful components of the current program: cohorts, core classes, etc. The new program has a total of 54 credit hours that includes the doctoral research field study in lieu of the traditional dissertation. Faculty believe that by having a more highly structured and supported field study experience and only admitting by cohorts annually, both the enrollment numbers and graduation rate will improve. The proposed program change will begin admitting students in fall semester of 2010.

The revision will require no additional faculty. Furthermore, the current program will continue until students who have been admitted complete their coursework and dissertation hours which will be in approximately 3 years.

Executive Ed. D. in Educational Leadership (9/24/09)

UCF's College of Education is one of the elite institutions participating in the Carnegie project to redesign the Education Doctorate. The UCF Educational Leadership program faculty designed the Executive Education Doctorate in Educational Leadership to be aligned with the Carnegie initiative while ensuring rigorous thinking and learning. The new program is also aligned with the proposed national standards on Advanced Leadership Certification and the Florida Principal Leadership Standards. Learning outcomes support current and future demands of complex environments with high levels of accountability. Doctoral field study focuses on issues that emulate from school districts and organizations. All students will be in a cohort for 3 calendar years or a 9 semester sequence (54 credit hours). Satisfactory academic performance will provide for on time graduation. No additional faculty or positions will be needed to implement this revised Ed. D. program.

Purpose: The purpose of the Executive Ed. D. in Educational Leadership is to develop influential leaders to effect positive learning outcomes for individuals and their organizations.

Students: The students to be served are educational leaders in schools and other educational settings, organizations, and related fields.

Executive Ed. D. Strands: There are six outcome strands that guide the program.

1. Serving student social, emotional, and educational needs. (6 credit hours)
2. Political governance influences (6 credit hours)
3. Learning and accountability (9 credit hours)
4. Professional leadership in organizations (9 credit hours)
5. Research (9 credit hours)
6. Doctoral field study (15 credit hours)

Strand 1: Learning and Accountability Courses and Outcomes

EDA XXX Instructional Leadership (3 ch)

- Strategize to improve student performance.
- Ensure research and evidence-based instructional practices.
- Provide change leadership.
- Provide access to rigorous curriculum and instruction for all learners.
- Provide professional development grounded in adult learning theory.
- Foster an interdisciplinary environment.
- Analyze research critically in order to make evidence-based decisions.
- Provide authentic feedback to teachers based on quality of instruction.
- Foster an interdisciplinary environment.

EDA XXX Human Resource Development in Educational Organizations (3 ch)

- Understand the function and importance of personnel management in organization systems
- Identify the processes, procedures, and techniques to manage human resources in an organization
- Understand the importance of planning, recruiting, selecting, placing, and maintaining highly qualified staff to reach organizational goals
- Understand the importance of maintaining an effective mentor/inductrion program that will strengthen and improve the quality of beginning staff members as well as current staff members in need of improvement
- Develop an understanding of the importance of staff development, grounded in adult learning theory for all staff within an organization
- Understand the importance maintaining and effective, result producing, performance evaluation system and procedures that is based on data and authentic feedback
- Understand the ethical considerations involved in personnel administration though modeling and leadership
- Create leaders within the school, district, and/or organization
- Develop an understanding of the state and federal mandates that influence the function of personnel management (NCLB, etc.)
- Foster an interdisciplinary environment within the organization

EDA 7274 Learning and Accountability (3 ch)

- Understand the role and importance of systemic frameworks in the analysis of data.
- Study and apply the concepts and principles of systems thinking and systems concepts in planning and design.
- Study and appreciate the applications of technology to educational management and leadership.
- Develop an understanding of analytics in educational decision making.
- Develop an understanding of the importance of interpreting and communicating evaluation findings.
- Acquire meaningful information through a proper analysis of data.
- Understand and appreciate the relevance of statistics to the roles of educational leaders

Strand 2: Serving Student Social, Emotional, and Educational Needs
Courses and Outcomes

EDA XXX Dynamics of Children, Families, and Organizations: Implications for Educational Leaders (3 ch)

- Understand the function and importance of families and the influences they have on children
- Identify external forces, e.g. economic, language, ethnicity, citizenship status, and cultures that may have an impact on children and families
- Understand the importance of maintaining effective communication and support system with children and families
- Understand the importance of making decisions based on human growth and development
- Understand the importance of developing programs and support services applicable to all students, including safety nets.
- Develop and provide professional development for schools, districts, and/or organizations to serve student needs
- Understand the importance of building a positive school, district, and/or organization to create a safe, nurturing environment for students

EDA XXX Community Outreach (3 ch)

- Develop a sound personal philosophy regarding school-community relations.
- Gain an understanding of the manner in which schools and other organizations and their constituent communities interact.
- Discover how to develop goals, strategies, and policies for an effective school-community or organization-community relations program.
- Develop strategies to communicate effectively with the media.
- Understand the importance of speaking and writing clearly in conveying messages.
- Recognize the importance of communication with both external and internal publics.
- Learn how to develop procedures for crisis communication.
- Gain an appreciation of how the political processes at the local, state, and national level impact school-community and organization-community relations.

Strand 3: Political Governance Influences Courses and Outcomes

EDA 7225 Advanced Legal Studies in Education (3 ch)

- Become knowledgeable about the legislative and charter provisions related to the establishment of educational institutions
- Develop an understanding of legal issues related to faculty personnel administration including that of academic freedom
- Develop an understanding of the legal issues related to administration of curriculum and instruction
- Develop an understanding of legal issues related to administration of the physical plant and environment with respect to construction contracts, campus security and safety
- Develop an understanding of the impact of federal government including equal employment and affirmative action and research contracts
- Develop an understanding of methods and procedures for legal research
- Develop an understanding of legal issues related to faculty misconduct including sexual harassment, gross insubordination and misconduct in office
- Develop an understanding of the collective bargaining process including grievance processing, arbitration and impasse resolution
- Develop an understanding of legal issues related to student/institutional relationships including the Doctrine of *In Loco Parentis*, student organizations, discipline, grading, student records and due process

EDA 7195 Politics, Governance, and Finance of Educational Organizations (3 c.h.)

- Understand the history of educational policy development in the U.S.
- Influence educational policy through social and political positions.
- Understand the major current policy issues facing the educational community.
- Influence educational policy at the local and state levels.
- Understand the politics involved in financing education on the local, state and federal levels.
- Develop an understanding of the changing perception of the public schools.
- Demonstrate strategies used by the political savvy leader.

Strand 4: Professional Leadership in Organizations Courses and Outcomes

EDA 7101 Organizational Theory (3 ch)

- Understand organizations in their historical context and subsequent evolution over the last 10 decades.
- Analyze historical development of organizational thought.
- Actively use the four analytic frameworks for the study of schools and organizations.
- Study contemporary organizational topics from various perspectives of theorists, literature and practitioners to become more reflective leaders.
- Develop a personal theory of practice based on theory, research, and literature.

EDA 7192 Leadership in Education (3 ch)

- Study theories and models of leadership related to the ethical and moral "Facilitating Reflective Practitioner."
- Demonstrate their best thoughts in regard to contemporary administrative practice and the integration of leadership theory, research and practice.
- Study topics of school organization from the various perspectives of theorists, empirical researchers and practitioners as they are influenced by leadership

EDA 7205 Program Planning and Evaluation (3ch)

- Understand the role and importance of systemic frameworks in planning, research, and evaluation.
- Study and apply the concepts and principles of system thinking in planning and design.
- Study and appreciate the contrasting purposes of planning and research.
- Develop an understanding of common types of evaluations and roles of evaluators.
- Develop an understanding of the steps involved in planning an evaluation and the importance of selecting an appropriate evaluation design.
- Develop an understanding of ethical considerations that must be addressed in evaluation activities.
- Develop an understanding of the importance of interpreting and communicating evaluation findings.

Strand 5: Research

EDF XXX Research in Leadership 1 (3 ch)

- Understand the role and importance of systemic frameworks and evaluation
- Understand and evaluate research
- Become familiar with core issues in educational research
- Utilize educational research in their academic and professional roles
- Study and appreciate the contrasting purposes of research and evaluation
- Develop an understanding of the steps involved in planning a research project and the importance of selecting an appropriate research design.
- Become familiar with common statistical methods

EDF XXX Research in Leadership 2 (3 ch)

- Develop an understanding of the research process in education through the integration of practice and study
- Understand and evaluate research
- Become familiar with core issues in educational research
- Utilize educational research in their academic and professional roles
- Develop an understanding of the uses of technology for conducting educational research
- Develop an understanding of the steps involved in planning a research project and the importance of selecting an appropriate research design
- Become familiar with more advanced statistical methods

EDF XXX Research in Leadership 3

- Develop an appreciation and understanding of the research process in education through the integration of practice and study
- Become familiar with core issues in educational research
- Utilize educational research in academic and professional roles
- Develop an understanding of the uses of technology for conducting educational research
- Develop an understanding of the steps involved in planning a research project and the importance of selecting an appropriate research design and statistical process
- Become familiar with more advanced research and statistical methods
- Understand practical application of data entry, analysis, and interpretation

Strand 6: Doctoral Field Study

EDA 7943 Field Project in Educational Leadership (3-6 ch)

- Submit to IRB the necessary documents to conduct research.
- Write and present a research proposal to the educational leadership faculty and client.
- Research and write a literature review to support the research.
- Present the literature review to the class and instructor.
- Maintain a journal of research experiences and submit to the instructor each semester.
- Meet with the instructor and client each semester to provide an interim report.
- Complete a written field project report
- Present findings and potential solutions to at least 3 educational leadership faculty members and the client.

Core Learning Principles: Program instruction will incorporate three categories of learning principles--Relationship to the Learner, Relationship to Content, Relationship Among Faculty

Relationship to the Learner

- Regular feedback
- Respectful to individuals, prior learning, knowledge, and experience
- Modeling of leadership, learning strategies, communication.
- Individualized
- Network building

Relationship to the Content

- Aligned with program purpose statement
- Learning content with practice
- Model evidence-based instruction
- Introduction/orientation to the learning/making connections
- Active involvement in the learning
- Discussions
- Analytical thinking
- Assessment centered, measureable, doable
- General learning to various settings
- Mastery learning
- Alignment with regulations, state and national standards

Relationship Among Faculty

- Strands and course outcomes are developed collegially.
- Collaborate to develop and refine program.
- Collaborate for student success.
- Commit to being role models aligned with expectations of successful graduates.

Executive Ed. D. in Educational Leadership Structure

Admission: This program requires a master's degree from an accredited institution in a related discipline (examples but not limited to: M.Ed., M.A.T., M.B.A.), a competitive GRE score, and a minimum GPA of 3.0 for the last 60 hours of undergraduate coursework. Admission will be fall semester annually.

Orientation: The faculty will provide orientation to the program at the beginning of the fall semester of enrollment.

Advisement: Because this is a cohort program with no flexibility in course offerings the Executive Ed. D. program coordinator will serve as the students' advisor. Students will consult with other faculty members as needed for program assistance, career counseling, and doctoral field study support.

Courses: Students will take courses in a prescribed sequence 6 semester hours each semester for three calendar years or 9 semesters with graduation at the end of the ninth semester with satisfactory academic performance. Doctoral study research is included in the 3-year/9 semester sequence. Students are expected to remain in the sequence for the entire 3-years.

Executive Ed. D. in Educational Leadership
Course Sequence

All courses are 3 credit hours unless noted with a total of 54 credit hours.

Year 1

Fall Semester	EDF 7xxx	Research in Leadership 1
	EDA 7101	Organizational Theory
Spring Semester	EDF 7xxx	Research in Leadership 2
	EDA 7274	Learning and Accountability
Summer Semester	EDA 7192	Educational Leadership
	EDA 7xxx	Dynamics of Children, Families, and Organizations

Milestone 1: Qualifying White Paper is required to continue in coursework.

Year 2

Fall Semester	EDA 7xxx	Community Outreach for Educational Leaders
	EDA 7xxx	Human Resource Development
Spring Semester	EDA 7195	Politics, Governance, and Financing of Educ. Organizations
	EDF 7xxx	Research in Leadership 3
Summer Semester	EDA 7943	Field Project in Educational Leadership 1
	EDA 7225	Advanced Legal Studies in Education

Milestone 2: Written Doctoral Field Study Proposal reviewed and accepted by at least 3 Educational Leadership faculty members. The oral defense of the proposal will be given to the Educational Leadership faculty and study clients. With successful defense students will be admitted to doctoral candidacy.

Year 3

Fall Semester	EDA 7205	Planning, Research, and Evaluation Systems
	EDA 7943	Field Project in Educational Leadership
Spring Semester	EDA 7943	Field Project in Educational Leadership
	EDA 7xxx	Instructional Leadership
Summer Semester	EDA 7943	Field Project in Educational Leadership

Program Milestones

Milestone 1: Qualifying White Paper

At the end of the third semester of coursework students will write a white paper on an approved topic or issue that is reviewed by at least 3 members of the Educational Leadership faculty. An acceptable qualifying white paper will allow the student to proceed with the next semester's courses.

Milestone 2: Field Study Proposal

During the summer semester of Year 2 students will submit a written client-based research proposal to be reviewed by at least 3 Educational Leadership faculty members. They will also have an oral defense of their doctoral field study proposal with the educational leadership faculty and field study clients. Upon successful defense of the proposal students will be admitted to doctoral candidacy.

Doctoral Field Study: Doctoral field study represents the research that students will develop, conduct, and report on both orally and in writing to demonstrate the outcomes of the program. School districts or other clients will identify issues to be researched which students will complete during the last 4 semesters of the program. Faculty will guide the students in rigorous doctoral research. During the field study process students will develop problem statements, research questions, literature review, collect and analyze data, create potential solutions, and make recommendations for improvement. Students will give a formal presentation to the educational leadership faculty and to the district/clients for whom the study was completed.

Ed. D. in Educational Leadership
Change
to the
Executive Ed. D. in Educational Leadership

Rationale:
The educational leadership faculty designed the Executive Ed. D. in Educational Leadership as a result of data study on graduation rates, enrollment data, and student/graduate follow up surveys. By redesigning the program aligned to the Carnegie Initiative on the Education Doctorate and proposed national standards for Advanced Certification for Educational Leaders, we believe that the program will attract, retain more students with a higher completion rate at the end of 3 years of study.

Element	Ed.D. 2009	Ed.D. Beginning Fall 2010
Selection	1000 GRE, GPA. 3.0	Competitive GRE, GPA 3.0, Master's degree in a related field, but not limited to M.Ed., M.A.T., M.B.A., M.A.
Admit	3 semesters	1/year fall semester
Sequence	Individual pace & cohorts	Cohort only
Advisor	Assigned or student selects	Doctoral program coordinator advises. Students work with faculty on research throughout the coursework
Meeting days	M or cohort specific	Monday/Thursday
Coursework	Pre-requisites Ed. Leadership certification	Admission to the program No specific prerequisite courses
	Core 15 ch EDA 7101 Org Theory EDA 7205Planning, Program Eval. EDA 7195 Politics EDA 7225 Personnel EDA7192 Leadership	30 ch EDA 7274 Learning & Accountability. EDA 7101 Org Theory EDA 7205Planning, Program Eval. EDA 7195 Politics, Governance, Finance EDA 7225 Adv. Legal St. in Education EDA7192 Educational Leadership EDA 7XXX Community Outreach for Educational Leaders EDA 7XXX Instructional Leadership EDA 7XXX Dynamics of Children, Families, & Organizations: Implications for Ed. Leaders EDA 7XXX Human Resource Dev. In Educational Organizations
	Specialization 12.ch EDA 7943 Proposal Writing EDA 6939 Seminar (Lit review?)	NA

	EDA 7274Tech Seminar EDA 7235 Law Seminar EDA ?Independent Study EDA 6502 Org/Admin. Instr. Prog. EDA 6300 Community/school	
	Cognate 6 ch.	NA
	Research 9 ch. EDF 6401, EDF, 7403, EDF 7463	Research 9 ch to be designed EDF 7XXX, EDF 7XXX, EDF 7XXX
	Dissertation 21 ch	15 hrs. Doctoral field study EDA 7943 Field Project 3-6 ch.
Total hrs.	63ch, up to 9 transfer	54 ch, no transfer except for transition period or Ed.S. who take EDA 7101 or on an individual basis
Comprehensive Exam Admission to Doctoral Candidacy	After coursework completion, before beginning dissertation hrs.	Qualifying White Paper 3rd semester of Year 1 Oral defense of doctoral field study proposal during summer semester Year 2.

Materials & Supplies Fee Requests for Graduate Courses for FALL 2010

COURSES	CURRENT FEE	REQUESTED FEE		JUSTIFICATION	APPROVED FEE	COMMENTS
College of Arts & Humanities						
Art						
FIL 5419 Developing the Screenplay	$0.00	$45.00		Script duplication: 500 pages x .09 copying expense.	$0.00	Not approved. Costs should be borne by the students directly.
FIL 6146 Screenplay Refinement	$0.00	$45.00		Script duplication: 500 pages x .09 copying expense.	$0.00	Not approved. Costs should be borne by the students directly.
FIL 6596 Advanced Directing Workshop	$0.00	$20.00		Theatre tickets: 2 @ $10 each.	$0.00	Not approved. Costs should be borne by the students directly.
FIL 6619 Guerilla Marketing	$0.00	$45.00		Website server space/domain name for the semester, $20; print run of cards/flyers to promote various films, $25.	$0.00	Not approved. Costs should be borne by the students directly.
FIL 6649 Microbudget Production Management II	$0.00	$45.00		1 photocopying, $7; 5 binders @ $6 each; 5 sets of 5 tabs @ $1.50 each.	$0.00	Not approved. Costs should be borne by the students directly.
College of Education						
Teaching & Learning Principles						
MAE 5318 Curriculum Methods in Elementary School Math	$0.00	$10.00		Students create manipulatives in this course for use in their future teaching as sell as for experiences. Cost of items per student: paper plates, $1.00; dot stickers, $2.50; construction paper, $1.50; index cards, $2.00; brad fasteners, $3.00.	$0.00	Not approved. Costs should be borne by the students directly.
College of Sciences						
Anthropology						
ANG 5XXX Quantitative Research in Anthropology	$0.00	$40.00		This fee will go toward the purchase of several SPSS licenses (currently $75 each) for the Anthropology Student Computer Lab, which is available for student use.	$0.00	Withdrawn by department.
Biology						
ZOO 5486 Mammalogy	$15.00	$0.00		Lab has been deleted.	$0.00	Approved fee of $0.00.
Psychology						
CLP 6XXX Career and Lifestyle Assessment	$0.00	$30.00		This is an assessment course that requires students to use copyrighted forms, worksheets, and materials. Cost of items per student: WJ III test of achievement forms, $6.56; CAI-enhanced Q local interpretive report, $9.65; ABAS-II adult forms, $5.44; Vineland-II survey interview forms, $5.92; quality of life inventory answer and worksheets, $2.14; WRAT-4 blue test/response forms, $1.72.	$30.00	Approved fee of $30.00.

University of Central Florida

Materials and Supplies Fee Request Form

☐ Course Addition ☐ Course Revision

Forward to your college office

This form is to be used for requests to add, increase, or delete materials and supplies fees. All requests for the next catalog must be submitted by October 31 for the November agenda deadlines of the Undergraduate Course Review Committee (Dr. Elliot Vittes) and the Graduate Council (Dean Patricia Bishop).

Request Routing: 1) Department Chair to College Dean's Office; 2) Dean's Office approved and enters data in online Course Action data base; 3) Graduate or Undergraduate committees review and Graduate or Undergraduate Dean submits to Provost; 4) Provost approves or disapproves request.

Materials and supplies fees must be used for expendable or consumable items that are above and beyond the normal materials and supplies used in classroom instruction (lab, clinical, studio supplies) and cannot be used for personnel services or equipment purchase/ rental. Maximum amount is $45.00.

Date Submitted: **College:**

Department:

Course Prefix & Number: **Course Title:**

Fees:

One course per form. Round fee to the nearest half dollar.

Current Fee: **Requested Fee:**

Estimated Annual Enrollment: **Revenue from Enrollment:**

Provide Justification for the Request:

Provide detailed cost information (per student) about the expenses for which the fee is to be assessed.

Items (per student)	Estimated Cost
[illegible]	

Approval Signatures

Department Chair **Date**

College Academic Standards **Date**

College Dean **Date**

Graduate Council **Date**

Academic Affairs **Date**

Materials & Supplies Fee Requests for Graduate Courses for FALL 2008

PREVIOUS YEARS' APPROVALS

COURSES	CURRENT FEE	REQUESTED FEE		JUSTIFICATION	APPROVED FEE	COMMENTS
College of Arts & Humanities						
Music						
MUN 5715L Jazz Ensemble	$0.00	$20.00		Music pieces(5 pieces) - University performing ensembles purchase and maintain a library of repertoire for study and performance. For piece studied or performed, multiple copies (1 for each student) must be purchased. Students use this music instead of textbooks associated with traditional courses. New and replacement music must be purchased each semester, and the cost of music has increased as has the number of pieces students study each semester.	$20.00	
MUN 5716L Jazz Chamber Group	$0.00	$20.00		Music pieces (4 pieces) - To purchase new and replacement sheet music used by students in the course. This music is sold only in sets, not individually. Students are not required to purchase a text.	$20.00	
MVJ 5359C Jazz Drum Set V	$0.00	$35.00		Drum head, tension rod, cymbal felts - Jazz drum set students practice on UCF owned instruments. Snare drums and bass drums have "drum heads" that are struck repeatedly by the students. Tension rods, hardware that holds drums in place, wear out and must be replaced regularly. Cymbals are suspended via felts and need to be replaced as they wear out. All of these items need to be replaced at least annually.	$35.00	
MVJ 5359C Jazz Drum Set VI	$0.00	$35.00		Drum head, tension rods, and cymbal felts - Jazz drum set students practice on UCF owned instruments. Snare drums and bass drums have "drum heads" that are struck repeatedly by the students. Tension rods, hardware that holds drums in place, wear and must be replaced regularly. Cymbals are suspended via felts and need to be replaced as they wear out. All of these items need to be replaced at least annually.	$35.00	

Materials & Supplies Fee Requests for Graduate Courses for FALL 2008

COURSES	CURRENT FEE	REQUESTED FEE		JUSTIFICATION	APPROVED FEE	COMMENTS
Art						
ART 5698 Concourse I	$0.00	$52.95		There are currently no lab fees in our new MFA program. Digital ink is a consumable used by all students in all six semesters. Items per student: 2 photo black ink cartridges, $8.90; 1 cyan ink cartridge, $4.45; I magenta ink cartridge, $4.45; 1 yellow ink cartridge, $4.45; 2 light cyan ink cartridge, $8.90; 2 light magenta ink cartridge, $8.90; and 2 light black ink cartridge, $8.90.	$45.00	
Art 5910 Studio Concentration I	$0.00	$52.95		There are currently no lab fees in our new MFA program. Digital ink is a consumable used by all students in all six semesters. Items per student: 2 photo black ink cartridges, $8.90; 1 cyan ink cartridge, $4.45; I magenta ink cartridge, $4.45; 1 yellow ink cartridge, $4.45; 2 light cyan ink cartridge, $8.90; 2 light magenta ink cartridge, $8.90; and 2 light black ink cartridge, $8.90.	$45.00	
ART 6699 Concourse II	$0.00	$52.95		There are currently no lab fees in our new MFA program. Digital ink is a consumable used by all students in all six semesters. Items per student: 2 photo black ink cartridges, $8.90; 1 cyan ink cartridge, $4.45; I magenta ink cartridge, $4.45; 1 yellow ink cartridge, $4.45; 2 light cyan ink cartridge, $8.90; 2 light magenta ink cartridge, $8.90; and 2 light black ink cartridge, $8.90.	$45.00	
ART 6911 Studio Concentration II		$52.95		There are currently no lab fees in our new MFA program. Digital ink is a consumable used by all students in all six semesters. Items per student: 2 photo black ink cartridges, $8.90; 1 cyan ink cartridge, $4.45; I magenta ink cartridge, $4.45; 1 yellow ink cartridge, $4.45; 2 light cyan ink cartridge, $8.90; 2 light magenta ink cartridge, $8.90; and 2 light black ink cartridge, $8.90.	$45.00	
Theatre						
TPP 6216C Theatre for Young Audiences Tour	$0.00	$45.00		This class requires students to produce, perform, & tour a production to schools in Orange County. T-Shirts are required for easy identification of tour members. Royalties must be paid to perform the show and students need materials and supplies to build sets and costumes. Supplies and costumes vary per semester: 1 TYA tour t-shirt, $9.00; 1 royalties, $30.00; and 1 materials and supplies for set and costume building, $6.00.	$45.00	

Materials & Supplies Fee Requests for Graduate Courses for FALL 2008

COURSES	CURRENT FEE	REQUESTED FEE		JUSTIFICATION	APPROVED FEE	COMMENTS
College of Medicine						
Molecular and Microbiology						
BSC 6407C Laboratory Methods in Molecular Biology	$45.00	$91.00		Lab fee request is to cover the cost of materials and supplies that are absolutely essential to run this course. 1 per student: T7 RiboMax Express RNAI system, $9.00; RT-PCR system, primers and sequencing, $12; Miniprep DNA purification system, $10; restriction enzymes, $5; competent cells, $6; vector for protein expression, $9; and magneHis protein purification system, $6.	$45.00	
College of Sciences						
Biology						
ZOO 5475L Field Ornithology	$15.00	$30.00		This field course requires extensive travel using department vehicles so the new fee will cover gas and tolls for the field vehicles: gas charges for department van assuming 12 field trips.	$30.00	
College of Education						
Child & Family Community Sciences						
SPS 6125 Infant Development Assessment	$0.00	$41.64		Fee is to cover the cost of expendable and consumable protocols that are used one time during this assessment course. Items per student: 4 Battelle development inventory II scoring forms, $2.91x4= $11.64; 4 Battelle developmental inventory II screener forms, $1.68x4= $6.72; and 8 eight Battelle development inventory II workbooks, 2.91 x8=23.28.	$42.00	
SPS 6191 Individual Psychoeducational Diagnosis I	$0.00	$53.76		Fee is to cover the cost of expendable and consumable protocols that are used one time during this assessment course. Items per student: 4 WISC IV record forms, $4.12x4 = $16.48; 4 WISC IV response booklets, $2.60x4 = $10.40; 4 WIAX response booklets, $2.60x4 = $10.40; and 4 WAIS III record forms, $4.12x4 = $16.48.	$45.00	
SPS 6192 Individual Psychoeducational Diagnosis II	$0.00	$46.72		Fee is to cover the cost of expendable and consumable protocols that are used one time during this assessment course. Items per student: 4 WJ III record forms ACH, $2.92x4 = $11.68; 4 WJ III response booklets ACH, $2.92x4 = $11.68; 4 WJ III record forms COG, $2.92x4 = $11.68; and 4 WJ III response booklets COG, $2.92x4 = $11.68.	$45.00	

FEE REQUESTS FOR GRADUATE COURSES FOR FALL 2007

COURSES	CURRENT FEE	REQUESTED FEE		JUSTIFICATION	APPROVED FEE	COMMENTS
College of Arts & Humanities						
Music						
MUN 5XXX Concert Band	new course	$10.00		Sheet music parts	$20.00	See note for explanation.*
MVP 5451 Percussion Ensemble	$0.00	$35.00		Drum heads $35 each	$35.00	
MUN 5XXX Wind Ensemble	new course	$10.00		Sheet music parts	$20.00	
MUN 5XXX Symphony Orchestra	new course	$10.00		Sheet music parts	$20.00	
MUN 5XXX Women's Chorus	new course	$10.00		Sheet music parts	$20.00	
MVP 6XXX Percussion VI	new course	$35.00		Drum heads $35 each	$35.00	
Theatre						
TPA 5885C Puppetry	$0.00	$30.00		Felt, glue/adhesives, styrofoam, dowels, trim materials, construction paper, foam paper, fabric.	$30.00	
Burnett College of Biomedical Sciences						
Biomolecular Science Center						
BSC 6407 Lab Methods in Molecular Bioloy	$45.00	$75.00		Form gel buffer, RNA ladder, RNA agents, prep spin mini prep kit, plasmid maxi kit, serological pipette tips, PET-52, Streptacin cartridge, strep tag II, strep tactin burner kit, adapter set, select 10-3 DNA, T select packaging kit.	$45.00	
College of Sciences						
Anthropology						
ANG 6123 Forensic Archeology Field Methods	$0.00	$22.00		String, flags, graph paper, bags, casting materials, stakes, and brushes.	$22.00	
ANG 6740C Advanced Forensic Anthropology	$0.00	$27.50		Photography scales, curation supplies, reconstruction supplies, and dental casting supplies.	$27.50	
CLP 7XXXC Clinical Practicum	$0.00	$15.00		WISC Intelligence scale forms, CBCL checklist rating forms, child depression inventory forms, child fear survey forms, WAIS intelligence scale forms, personality inventory forms, teacher rating forms, child memory scale forms, prorated costs for new test kits.	$15.00	

FEE REQUESTS FOR GRADUATE COURSES FOR FALL 2006

COURSES	CURRENT FEE	REQUESTED FEE	JUSTIFICATION	APPROVED FEE	COMMENTS
College of Arts & Humanities					
Music					
MUN 5XXXL Early Music Ensemble	new course	$5.00	Sheet music	$5.00	
MUN 5XXXL Graduate Chamber Music	new course	$5.00	Sheet music for chamber ensemble	$5.00	
MUN 5XXXL Graduate Madrigal Singers	new course	$5.00	Sheet music for Madrigals	$5.00	
MUN 5XXXL Graduate University Chorus	new course	$5.00	Sheet music for chorus	$5.00	
MUN 5XXXL Graduate Women's Chorus	new course	$5.00	Sheet music	$5.00	
MVP 5451 Percussion V	$0.00	$35.00	Drum heads $25, keyboard rope $5.00, cymbal straps and felts $5	$35.00	
College of E&CS					
MMAE					
EMA 5584 Biomaterials	$45	$0	Lab fees should not be charges as this course does not have a lab component.	$0.00	
College of Education					
Teaching & Learning Principles					
ARE 5359 Teaching Art K-12	$0	$5	Arts and supplies	$5.00	
ARE 5454 Studio Experiences in Art Education	$3	$5	Arts and supplies	$5.00	
ARE 6195 Teaching Art Appreciation with Interdisciplinary Strategies	$0	$5	Arts and supplies	$5.00	
ARE 6666 Arts Advocacy	$0	$5	Arts and supplies	$5.00	
College of Health & Public Affairs					
Nursing					
NGR 5004L Advanced Health Assessment Lab	$20	$45	See attached spreadsheet	$45.00	
NGR 6482L Women's Health for APNs Clinical	$40	$45	See attached spreadsheet	$45.00	

FEE REQUESTS FOR GRADUATE COURSES FOR FALL 2005

COURSES	CURRENT FEE	REQUESTED FEE	JUSTIFICATION	APPROVED FEE	COMMENTS
College of Arts & Sciences					
Biology					
phy 5XXXL Building Physics Apparatus	new course	$45.00	Shop safety glasses $10; end mills $10; vernier calipers $8; edge finder $10; center drill $7	$45.00	
CHM 5451C Techniques in Polymer Science	$25.00	$45.00	Benzoin 98% 5G $11.07; Benzoyl peroxide R 36.69; Methyl methacrylate 33.95; poly blk sheeting 36.30; acrylic acid 13.69; t-butyl hydroperoxide 100 ML 12.55; molecular sieves 27.31; silicon oil 500 ML 67.80; strene monomer cert IL 17.97; STP FB turnover 37 red 10/pk 7.54; ammonium persulfate 25.75; methyl acrylate 16.81; sodium chloride cert 13.93; sodium lauryl sulfate 11.92; 2 butanone 99% I liter 21.20; N-butyllithium, 2.5 M SOL 100 ML 22.30; stirring magnet in glass 16.39; hexamethylene diamine 11.12; phenol reagent 33.24; spec jar forcep 50.04; pyridine certified ACS 500 MOP 27.75; sebocoyl chloride 25 ML 21.32; tetrachlorethylene 99% 11.40; isophthaloyl dichlorida, 100 gr 13.45;	$45.00	
			dis alum spt cult/wegh 100/pk 10.45.		
College of Health and Public Affairs					
Nursing					
NGR 6240L Adult I Clinical for APN's	$0.00	$10.00	Disposable gloves $1.20; alcohol pads .23; cotton tip applicator .17; unsterile dressings 2.57; EKG electrode 3.96; tongue blades .42; thermoscan probe covers 1.69; disposable speculae for otoscopes .13.	$10.00	
NGR 6332L PEDS II Clinical	$0.00	$15.00	Growth charts 1.40; disposable gloves 1.79; tongue blades .42; disposable speculae for otoscopes .43; history and physical exam forms 3.20; alcohol pbads .23; thermoscan probe 1.69; EKG electrodes 3.96; cotton tip applicators 2.32.	$15.00	
NGR 6482L Women's Health Clin	$0.00	$40.00	Disposable gloves 1.20; disposable speculae 6.29; lubricant 27.80; thermocult test 2.30; alcohol pads .23; cotton tip applicator .17; unsterile dressings 2.57.	$40.00	

Graduate Council Curriculum Committee
Course Agenda for 01-21-2010
Revised

College of Arts & Humanities Course Action Additions

Tabled. Needs more rigor for grad course.

MUT 5XXX CAH-Music 3(3,0)

Analysis of Twentieth Century Music: PR: Graduate Standing in Music or C.I. Analysis of music in a selection of the different styles practiced in the 20th century, with an emphasis on Western art music. *Fall.*

30 character abbreviation: **Analysis Twentieth C. Music**

Tabled. Needs more rigor for grad course.

Analysis

MUT 5XXX CAH-Music 3(3,0)

Counterpoint: PR: Graduate standing in Music or C.I. Principles of counterpoint and the study of contrapuntal styles in Western music from the 16th century to the present day. *Even Spring.*

30 character abbreviation: **Counterpoint**

College of Sciences Course Action Additions

MS/PhD Math Program Revisions

MAA 5XXX COS-Mathematics 3(3,0)

Analysis I: PR: MAS 3106 or C.I. Real numbers, limits, differentiation, Riemann integrals, Riemann-Stieltjes integrals, calculus in R^n,; metric and normed spaces, contraction mapping theorem, inverse and implicit functions. *Fall.*

30 character abbreviation: **Analysis I**

MAA 6XXX COS-Mathematics 3(3,0)

Analysis II: PR: MAA 5xxx (Analysis I) or C.I. Topological Spaces, Banach Spaces, Hilbert Spaces, Bounded Linear Operators, Distribution and; Fourier Transform, Measure Theory and Function Spaces. *Spring.*

30 character abbreviation: **Analysis II**

Engineering & Computer Science Course Action Additions

EMA 6XXX ECS-Mechanical/Matrls/Aerosp 3(3,0)

Colloids and Interface Engineering: PR: EMA 5104 or EMA 5060 or C.I. Surface and interfacial tension of liquids, self-assembled monolayers, applications of scanning probe microscopes in interfaces, forces in colloidal systems, stability of macro emulsions, formation and properties of microemulsions, self-assembly. *Occasional.*

30 character abbreviation: **Colloids & Interface Eng**

College of Education Course Action Additions

Executive Ed.D. in Ed Leadership courses

EDA 7XXX ED-Ed Research, Tech & Lead 3(3,0)
Community Outreach for Educational Leaders: The course focus will be on developing understandings of the essential relationships between schools and community organizations and the community organizations with themselves. *Fall.*
30 character abbreviation: **Commun Outreach Educ Leaders**

EDA 7XXX ED-Ed Research, Tech & Lead 3(3,0)
Dynamics of Children, Families, & Organizations: Implications for Educational: This course will provide an understanding of diversity in contemporary families, theoretical perspectives, and services, as well as creating safe schools and/or organizations. *Occasional.*
30 character abbreviation: **Dyn Child Fam & Org: Implicatn**

EDA 7XXX ED-Ed Research, Tech & Lead 3(3,0)
Human Resource Development in Educational Organizations: The purpose of this course is to provide understanding of the functions of recruiting, selecting, placing, evaluating, and compensating people. *Fall.*
30 character abbreviation: **Human Resource Dev in Educ Org**

EDA 7XXX ED-Ed Research, Tech & Lead 3(3,0)
Instructional Leadership: Study and analysis of research on leadership resulting in improved student achievement at the local, state, and national levels is the focus of this course. *Spring.*
30 character abbreviation: **Instructional Leadership**

This course not connected with Executive Ed.D. in Ed Leadership

EDF 7XXX ED-Ed Research, Tech & Lead 3(3,0)xxxx
Quantitative Research Synthesis: PR: Equivalent to EDF 6481 and EDF 7403. This course addresses the problem of the accumulation of evidence in scientific research through the use of quantitative methods for research synthesis and meta-analysis. *Spring.*
30 character abbreviation: **Quant Research Synthesis**

Executive Ed.D. in Ed Leadership courses

EDF 7XXX ED-Ed Research, Tech & Lead 3(3,0)
Research in Leadership 2: Methods applied to statistical problems and resolution of selected problems appropriate for statistical applications is the focus of the course. *Spring.*
30 character abbreviation: **Research in Leadership 2I**

EDF 7XXX ED-Ed Research, Tech & Lead 3(3,0)
Research in Leadership 3: Research 3 continues the development of respect for the scientific spirit of inquiry and to build upon the problem-solving and research strategies studied in Research 1 and Research 2. The course is intended to enhance students' comfort and confidence with research and statistical tools that will enhance their professional effectiveness. *Spring.*
30 character abbreviation: **Research in Leadership 3**

EDF 7XXX ED-Ed Research, Tech & Lead 3(3,0)

Research Leadership I: Study, analysis, and understanding of applied educational research methods are the focus of the course. *Fall.*
30 character abbreviation: **Research Leadership I**

This course has been removed as it is for a fee approval only and should not have been on this list.

College of Arts & Humanities Course Action Revisions

FIL 6649 Film Production Management II 3(3,0)
PR: FIL 6644.
Continued examination of production challenges that are unique to filmmakers working with extremely limited budgets, including casting, schedules, and set management.
Materials & Supply Fee addition proposed: $45.00

College of Sciences Course Action Revisions

MS/PhD Math Program Revisions

MAA 6405 Complex Variables 3(3,0)
PR: MAA ~~4226, MAP 4307, and graduate standing~~ 5xxx (Analysis I) or C.I.
~~Analytic functions. Harmonic functions. Integration in the complex plane. Laurent series. Residue calculus. Inversion of Laplace transformations. Maximum Modulus Principle. Conformal mappings.~~
Complex plane, analytic functions, harmonic functions, Cauchy's theorem and integral formula,; maximum modulus principle, Laurent series, singularities, the residue theorem.

MAP 5336 Ordinary Differential Equations and Applications 3(3,0)
~~PR: MAP 2302, and graduate status or senior standing~~ PR: MAA 5xxx (Analysis I) or C.I.
Existence and uniqueness of solutions of differential equations, systems of ordinary differential equations, autonomous systems, phase plane analysis, stability, bifurcations.
30 character abbreviation: **Ordinary Differential Equation**

MAP 6385 Applied Numerical Mathematics 3(3,0)
PR: MAP ~~5117, MAA 5210, graduate standing,~~ 5117 or C.I.
~~Gaussian elimination, Gauss-Seidel iteration, optimization procedures,~~ Solution of linear systems, numerical linear algebra, ~~equations.~~ numerical solution of ordinary differential equations, numerical partial differential equations.

MAS 5145 Advanced Linear Algebra and Matrix Theory 3(3,0)
PR: MAS ~~3105, and graduate status or senior standing~~ 3106 or C.I.
~~LU and LDU decompositions, linear spaces, inner product spaces, systems of linear equations, eigenvalues and canonical forms, variational principles and applications.~~
Linear spaces, subspaces, linear transformations, matrices, eigenvalues and eigenvectors, Jordan; forms, positive definite matrices, bilinear and quadratic forms, functions of matrices.
30 character abbreviation: **Adv Linear Algebra & Matrix Th**

MAT 5711 Scientific Computing 3(3,0)
PR: MAC 2313, MAP ~~2302, graduate status or senior standing,~~ 2302 or C.I.
~~Basic programming skills using Mathematica, Maple, Matlah, or Java in solving basic scientific computing problems; preparing students for advanced computational methods and algorithms.~~

Matlab fundamentals, computer arithmetic, nonlinear equations, polynomial interpolation, divided; differences, splines, curve fitting, least-squares method, numerical differentiation and Integration.

This course not connected with MS/PhD Math Program Revisions

PHZ 5432 Introduction to Soft Condensed Matter Physics 3(3,0)

PR: PHY 3513 or C.I.

~~Introduction to the physics of polymers, colloids, surfactants using basic tools of statistical mechanics. Graded S/U.~~

Introduction to the physics of polymers, colloids, surfactants using basic tools of statistical mechanics.

Will no longer be graded S/U.

Engineering & Computer Science Course Action Revisions

~~CAP 5419~~ 3D Computer Vision 3(3,0)

CAP 6XXX

~~PR: C.I.~~ PR: CAP 5415 or EEL 5820 or C.I.

2D/3D Projective Geometry, Projective Transformation Estimation, Camera Calibration, Single View Modeling, Bi-focal Modeling, Fundamental Matrix, Stratified Structure, Homography, Tri-focal Tensor, Auto-Calibration, Cheirality.

EAS 5407 Mechatronic Systems 3(3,0)

PR: EML ~~4804C or EAS 4404C.~~ 4312C or C.I.

Discrete control techniques for aerospace mechatronic systems. Controller design, test and evaluation applications.

~~EMA 6611C Optoelectronic Materials Processing 3(2,2)~~

EMA 6611 Optoelectronics Materials Processing 3(3,0)

~~PR: EMA 5317,~~ PR: EGN 3365, Graduate standing or C.I.

~~Techniques~~ Electronic Theory for Materials Preparation, Doping, Metallization, Effect of Materials Properties on Device ~~(e.g.,~~ (eg. Solar Cells, ~~lasers and transistors) performances, electronic and optical characterization of device materials.~~ LEDs, and Detectors) Performances.

30 character abbreviation: **Optoelect Materials Processing**

College of Education Course Action Revisions

Executive Ed.D. in Ed Leadership courses

EDA 7225 ~~Educational Personnel Administration~~ 3(3,0)
Advanced Legal Studies in Education

PR: Doctoral standing or C.I.

~~Examination of the personnel function in educational institutions including planning, recruitment, selection, placement, induction, appraisal, collective bargaining and contract administration.~~

In depth study of current legal issues confronting educational leaders and their private sector counterparts.

30 character abbreviation: **Advanced Legal Studies in EDUC**

EDA 7274 ~~Seminar: Applications of Technology to Educational Leadership 3(4,0)~~
Learning and Accountability 3(3,0)

~~PR: EDA 6260 or C.I.~~
Study of ~~administrative and leadership technology~~ analytical applications at the school building or district ~~level.~~ level for instructional improvement.
30 character abbreviation: **Learn & Acctn**

EDA 7943 **~~Field Project~~** **~~3(3,0)~~**
Field Project in Educational Leadership **3(3-6,0)**
PR: C.I.
Field experience and projects for advanced graduate students. Participation in school plant surveys, accreditation visitation, curriculum studies, administrative analysis, field research. May be repeated for credit.
30 character abbreviation: **Field Proj Ed Lead**