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FEB 23 2016

OFFICE OF THE
SENATE COUNCIL**1. General Information**

1a. Submitted by the College of: ARTS & SCIENCES

Date Submitted: 1/28/2016

1b. Department/Division: Mathematics

1c. Contact Person

Name: Uwe Nagel

Email: uwe.nagel@uky.edu

Phone: 7-6793

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Specific Term/Year¹ Fall 2016

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: MA 665

2c. Full Title: Rings and Modules

2d. Transcript Title:

2e. Cross-listing:

2f. Meeting Patterns

LECTURE: 3

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: This graduate course is a continuation of MA 661. Topics include modules over principal ideal domains, localization, primary decomposition, associated prime ideals, classes of rings and modules such as Noetherian rings and Dedekind domains, tensor and exterior products, exact sequences and resolutions, ideals and varieties, Hilbert's Nullstellensatz.

- 2k. Prerequisites, if any: MA 561 and MA 661 or consent from instructor.
- 2l. Supplementary Teaching Component:
3. Will this course taught off campus? No
If YES, enter the off campus address:
4. Frequency of Course Offering: Fall,
Will the course be offered every year?: Yes
If No, explain:
5. Are facilities and personnel necessary for the proposed new course available?: Yes
If No, explain:
6. What enrollment (per section per semester) may reasonably be expected?: 10
7. Anticipated Student Demand
Will this course serve students primarily within the degree program?: Yes
Will it be of interest to a significant number of students outside the degree pgm?: No
If Yes, explain:
8. Check the category most applicable to this course: Traditional – Offered in Corresponding Departments at Universities Elsewhere,
If No, explain:
9. Course Relationship to Program(s).
a. Is this course part of a proposed new program?: No
If YES, name the proposed new program:
b. Will this course be a new requirement for ANY program?: No
If YES, list affected programs:
10. Information to be Placed on Syllabus.
a. Is the course 400G or 500?: No
b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from 10.a above) are attached: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1. How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?
2. How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.
3. How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.
4. Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?
If yes, which percentage, and which program(s)?
5. How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?
6. How do course requirements ensure that students make appropriate use of learning resources?
7. Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.
8. How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (<http://www.uky.edu/UKIT/>)?
9. Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO
If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.
10. Does the syllabus contain all the required components? NO
11. I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|RBROWN|Russell M Brown|MA 665 NEW Dept Review|20151210

SIGNATURE|ACSI222|Anna C Harmon|MA 665 NEW College Review|20160202

SIGNATURE|ZNNIKO0|Roshan N Nikou|MA 665 NEW Graduate Council Review|20160223

New Course Form

<https://myuk.uky.edu/sap/bc/soap/rfc?services=>

[Open in full window to print or save](#)

Generate R

Attachments:

[Browse...](#)

Upload File

	ID	Attachment
Delete	6164	syll_rings-modules_160127.pdf
	First	1 Last

(*denotes required fields)

1. General Information

- a. * Submitted by the College of: Submission Date:
- b. * Department/Division:
- c.
- * Contact Person Name: Email: Phone:
- * Responsible Faculty ID (if different from Contact): Email: Phone:
- d. * Requested Effective Date: Semester following approval OR Specific Term/Year
- e. Should this course be a UK Core Course? Yes No
- If YES, check the areas that apply:
- Inquiry - Arts & Creativity Composition & Communications - II
- Inquiry - Humanities Quantitative Foundations
- Inquiry - Nat/Math/Phys Sci Statistical Inferential Reasoning
- Inquiry - Social Sciences U.S. Citizenship, Community, Diversity
- Composition & Communications - I Global Dynamics

2. Designation and Description of Proposed Course.

- a. * Will this course also be offered through Distance Learning? Yes No
- b. * Prefix and Number:
- c. * Full Title:
- d. Transcript Title (if full title is more than 40 characters):
- e. To be Cross-Listed ² with (Prefix and Number):
- f. * Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours³ for each meeting pattern type.
- | | | | |
|----------------------------------------|----------------------------------------------|---------------------------------|---------------------------------|
| <input type="text" value="3"/> Lecture | <input type="text"/> Laboratory ¹ | <input type="text"/> Recitation | <input type="text"/> Discussion |
| <input type="text"/> Indep. Study | <input type="text"/> Clinical | <input type="text"/> Colloquium | <input type="text"/> Practicum |
| <input type="text"/> Research | <input type="text"/> Residency | <input type="text"/> Seminar | <input type="text"/> Studio |
| <input type="text"/> Other | If Other, Please explain: | | |
- g. * Identify a grading system:
- Letter (A, B, C, etc.)
- Pass/Fail
- Medicine Numeric Grade (Non-medical students will receive a letter grade)
- Graduate School Grade Scale
- h. * Number of credits:
- i. * Is this course repeatable for additional credit? Yes No
- If YES: Maximum number of credit hours:
- If YES: Will this course allow multiple registrations during the same semester? Yes No

j. * Course Description for Bulletin:

This graduate course is a continuation of MA 661. Topics include modules over principal ideal domains, localization, primary decomposition, associated prime ideals, classes of rings and modules such as Noetherian rings and Dedekind domains, tensor and exterior products, exact sequences and resolutions, ideals and varieties, Hilbert's Nullstellensatz.

k. Prerequisites, if any:

MA 561 and MA 661 or consent from instructor.

l. Supplementary teaching component, if any: Community-Based Experience Service Learning Both3. * Will this course be taught off campus? Yes No

If YES, enter the off campus address:

4. Frequency of Course Offering.

a. * Course will be offered (check all that apply): Fall Spring Summer Winter

b. * Will the course be offered every year? Yes No

If No, explain:

5. * Are facilities and personnel necessary for the proposed new course available? Yes No

If No, explain:

6. * What enrollment (per section per semester) may reasonably be expected? 10

7. Anticipated Student Demand.

a. * Will this course serve students primarily within the degree program? Yes No

b. * Will it be of interest to a significant number of students outside the degree pgm? Yes No

If YES, explain:

8. * Check the category most applicable to this course:

Traditional -- Offered in Corresponding Departments at Universities Elsewhere

Relatively New -- Now Being Widely Established

Not Yet Found in Many (or Any) Other Universities

9. Course Relationship to Program(s).

a. * Is this course part of a proposed new program? Yes No

If YES, name the proposed new program:

b. * Will this course be a new requirement⁵ for ANY program? Yes No

If YES⁵, list affected programs:

10. Information to be Placed on Syllabus.

a. * Is the course 400G or 500? Yes No

If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in 10.b. You must include: (i) identify additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR

b. * The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable 10.a above) are attached.

¹¹ Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

¹² The chair of the cross-listing department must sign off on the Signature Routing Log.

- ▣ In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, require two hours per week for a semester for one credit hour. (from SR 5.2.1)
- ▣ You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.
- ▣ In order to change a program, a program change form must also be submitted.

Rev 8/09

MA 665 001
Rings and Modules

Instructor: Uwe Nagel
Office Address: 763 Patterson Office Tower
Email: uwe.nagel@uky.edu
Office Phone: 257-6793
Office hours: MWF, 1 – 2 pm

Course Description

BULLETIN DESCRIPTION: This graduate course is a continuation of MA 661. Topics include modules over principal ideal domains, localization, primary decomposition, associated prime ideals, classes of rings and modules such as Noetherian rings and Dedekind domains, tensor and exterior products, exact sequences and resolutions, ideals and varieties, Hilbert's Nullstellensatz.

Prerequisites

MA 561 and MA 661 or consent of instructor.

Student Learning Outcomes

After completing this course, the student will be able to:

1. More successfully develop strategies for solving mathematical problems.
2. Demonstrate understanding of research articles, books, and other information needed for thesis research in Algebra or a related area.
3. Demonstrate their persistence and critical analysis skills when working on mathematics.

By actively engaging in the exploration of algebraic topics the students will achieve the above learning outcomes and acquire a sense of the breadth of algebra.

Suggested Materials

1. Commutative Algebra by David Eisenbud
2. Introduction to Commutative Algebra by M.F. Atiyah and I.G. MacDonald
3. Abstract Algebra by David S. Dummit and Richard M. Foote
4. Basic Algebra I by Nathan Jacobson

Description of Course Activities and Assignments

One midterm and a final exam at 100 points each.
Written homework at 100 points together.

Summary Description of Course Assignments

Written homework will be assigned regularly. Students are expected to write up their solutions individually. These are carefully drafted documents that should be mathematically correct and be written in good English.

Group work and discussions on the problems are encouraged. However, each student is expected to make a genuine effort in solving a problem her- or himself before talking to anyone about the problem. Moreover, the solutions must be written up on her or his own.

Course Grading

Grading scale:

90-100% = A

80 - 89% = B

70 - 79% = C

Below 70%= E

Tentative Course Schedule

Topics discussed in the course include modules over principal ideal domains, localization, primary decomposition, associated prime ideals, classes of rings and modules such as Noetherian rings and Dedekind domains, tensor and exterior products, exact sequences and resolutions, ideals and varieties, Hilbert's Nullstellensatz.

There will be three lectures per week.

Homework will be assigned every 7-14 days.

The final exam will take place in the Final Exam period. The midterm exam will take place near the middle of the semester.

Precise dates for homework and exams TBA.

Final Exam Information

The final exam is comprehensive. Time and date TBA.

Submission of Assignments

Students submit hard copies of their solutions. No late work will be accepted unless arranged prior to the due date.

Attendance Policy

Students are expected to be engaged participants in every class.

Excused Absences

Students need to notify the professor of absences prior to class when possible. *Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy.

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

Verification of Absences

Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

Academic Integrity

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code

of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Senate Rules 6.3.1 (see <http://www.uky.edu/Faculty/Senate/> for the current set of *Senate Rules*) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Accommodations due to disability

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>.