

## **Report of the Committee on Educational Policy and the Curriculum Recommendations for approval to the Faculty of Arts and Sciences**

To be presented at the February 22, 2017, meeting of the Faculty of Arts and Sciences  
(Information is from the February 7, 2017, CEPC meeting)

The full text of syllabi, program descriptions, Undergraduate Record entry, and other documentation for these recommendations are available prior to the FAS meeting in the office of the College Registrar, 106 Monroe Hall. Some documentation is appended at the end of this report for the Program Change Proposals, New Program Proposals, and Curriculum Development Pilot Plan Proposal (*i.e.*, documentation for New Course Proposals is not appended). Changes approved by the FAS will appear and become effective in the Fall 2017-2018 Undergraduate Record that is published August 1, 2017.

### **NEW COURSE PROPOSALS**

**The Committee recommends adoption of the following course additions. In each case, the proposal is to add a new course to the Undergraduate Record.**

#### *INTERDISCIPLINARY~AMERICAN STUDIES PROGRAM*

AMST 3880 Literature of the South  
AMST 3200 African American Political Thought  
AMST 3425 American Material Culture

#### *ANTHROPOLOGY DEPARTMENT*

ANTH 2415 Language in Human Evolution

#### *ASTRONOMY DEPARTMENT*

ASTR 1290 Black Holes

#### *BIOLOGY DEPARTMENT*

BIOL 4335 Functional Organization of Sensory Systems  
BIOL 3710 The Biology of Stress

#### *ENGLISH LANGUAGE & LITERATURE DEPARTMENT*

ENWR 3660 Travel Writing  
ENWR 3665 Writing About the Environment  
ENWR 3650 Remix Culture  
ENWR 2630 Writing About Work

#### *HISTORY DEPARTMENT*

HIUS 4260 Voices of the Civil War  
HIEU 3670 The Fall of Communism: How the Soviet Empire Lost the Cold War

#### *INTERDISCIPLINARY~MEDIA STUDIES PROGRAM*

MDST 3230 Basic Multimedia Reporting

*PSYCHOLOGY DEPARTMENT*

PSYC 2900 Teaching Methods for Undergrad Teaching Assistants

*RELIGIOUS STUDIES DEPARTMENT*

RELB 2900 Buddhist Meditation Traditions

RELG 3255 Ethics, Literature, and Religion

RELI 2085 Modern Islam: From the Age of Empires to the Present

RELG 2820 Jerusalem

**PROGRAM CHANGE PROPOSAL**

**The Committee recommends adoption of the following changes in major requirements.**

*ECONOMICS DEPARTMENT* (Header in red “Changes to ECON major requirements” pages 1 through 15 of 15 following this report)

A number of minor changes to courses and concentration class options. Generally, cleaning up the Record. Deleted courses that don’t exist anymore. Identified additional optional courses appropriate to various concentrations in the major.

**NEW PROGRAM PROPOSAL**

**The Committee recommends adoption of the following new FORUM.**

*FORUM:* (Header in red “New FORUM proposal” pages 1 through 4 of 4 following this report)

To create a new FORUM for Fall 2017: **Food, Society and Sustainability**

Planned by Paul Freedman (Politics) and Manuel Lerdau (Environmental Sciences).

Uses food as a vehicle to explore grand questions such as what it means to be human and how our humanity depends upon and can be freed from our biology. Examines the role of food as a cultural artifact, a political and military tool, and as semi-natural phenomenon that has contributed to the greatest change on Earth’s surface since the ice ages.

**CURRICULUM DEVELOPMENT PILOT PROGRAM PROPOSAL**

**The Committee recommends adoption of a change in course discipline tagging relative to the Dec 6 2016 status**

*Change the Discipline tag:* (Header in red “Discipline tag change” pages 1 through 3 of 3 following this report)

Change PHYS 3040 Physics of the Human Body to the discipline tag *Living Systems* (instead of *Chemical, Physical, Mathematical Universe*)

Submitted by  
Janet Herman  
Chair, CEPC

Updike, Judith G. (jgu2k)

New Business

**From:** Anderson, Elysia (ef8t)  
**Sent:** Monday, December 05, 2016 8:47 AM  
**To:** Updike, Judith G. (jgu2k)  
**Cc:** Olsen, Edgar O. (eoo); Coppock, Lee A. (lc7p)  
**Subject:** Fall 2016 catalog/course changes  
**Attachments:** CCI form- ECON 4170.doc; CCI form- ECON 4660.doc; CCI form- ECON 4720.doc; Economics Revisions for 2017-2018- mid-year changes Fall 2016.docx

Judy,

Our Undergraduate Programs Committee recently voted and passed a number of minor changes to our courses and concentration class options. I hoping that these are non-controversial changes in the eyes of the College, but do let me know if Dean Hadley feels that any of these require CEPC approval or if we need to include any other statements/documentation.

Below is a summary of the changes and attached are the required documents (3 CCI forms, Word document with tracked changes highlighted). Please let me know if these are approved by the College and UReg, and whether we may implement these changes in SIS and on our website. I understand that some of the catalog changes will only appear in the 2017-2018 catalog, so I will be sure to include them when I send our changes for next year.

In Word doc:

1. Page 6: Concentration description updated to include that Linear Algebra is required for ECON 4720.
2. Page 7: Add ECON 4365 (Global Financial Markets) to the electives under the finance concentration. This course is a new course approved earlier this semester. Add this course as an elective option for Financial Economics concentration.
3. Allow students who take ECON 3559 (Economics of Africa) in Spring 2017 only from Mark Plant to fulfill the elective requirement for the International Economics concentration. This is not a permanent addition to our course offerings, so it is not included in the Word document for Catalog changes. This will be programmed into the concentration requirements in SIS.
4. Page 8: Delete ECON 2050 (European Economic History) from the electives under the International Economics concentration. We deleted the course last year.
5. Page 9: Add ECON 4440 (Economic Inequality) as an option to fulfill the elective requirement under the Public Policy concentration.
6. Page 7: Add ECON 4170 as an option to fulfill the elective requirement under the Industrial Organization concentration.

CCI Forms:

7. (Also reflected in Word doc, last page) Delete ECON 4660 (Economy of Japan) from our course offerings. To the best of our knowledge, Bruce Reynolds was the only faculty member who ever taught it. We deleted his course on the economy of China a few years ago but neglected to delete this course.
8. Add MATH 3350, MATH 3351, or APMA 3080 (courses in linear algebra) to the prerequisites for ECON 4720 (Econometric Methods). This is a required course for the finance concentration. In the past, students taking the concentration have been encouraged to take a course in linear algebra (this is recommended within the concentration description). Because he uses material from linear algebra heavily in teaching ECON 4720, Professor Denis Nekipelov would like to list a course in the subject matter as a prerequisite for 4720. Professor Nekipelov has taught this course for the past 3 semesters and will likely teach it in the foreseeable future. This course is not being offered this Spring (likely Fall 2017), and students will be notified of this change.

12-5-16

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ef 8t

Eli<sup>c</sup> Anderson  
ECON

9. (Also reflected in Word doc, last page) Change the title of ECON 4170 from The Economics of Information and Uncertainty to The Economics of Risk, Uncertainty, and Information. Len Mirman taught this course for many years has retired, and Marc Santugini, the faculty member who will teach it most often in the near future, requests this modest change to better reflect its content.

Sincerely,

Elysia "Ellie" Anderson (née Fung)

Undergraduate Program Coordinator

Monroe Hall, Room 253

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# Economics

James Wilson Department of Economics

Program/Course: Economics

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**Overview** While economics is about the economy, economics is a way of thinking about the world using both theory and evidence to study a broad array of topics. The Department of Economics provides students with the analytical tools necessary to study and understand real world events at the micro level (e.g., consumers and markets) and macro level (e.g., national and global). Our students use economic analysis to study topics from education to marriage and the family, from international trade and finance to politics and economic development, from the environment to income distribution -- and more. Majors in the Department of Economics leave the program equipped to analyze problems and issues in both the private and public sectors of the economy. They are employed in a wide variety of endeavors: industry, consulting, management, finance, government, banking, think tanks, entrepreneurial endeavors, as well as entering graduate school in fields as diverse as business, law, public policy, medicine, and advanced work in economics.

**Faculty** The University has a distinguished Department of Economics. Its faculty members have international reputations in their areas of specialization and are committed to teaching undergraduates, training graduate students, and conducting economic research. Departmental specialties include industrial organization, international trade and finance, labor economics, economic development and environmental economics, the economics of education, and the economics of the public sector.

**Students** Economics is one of the most popular subjects at the University. The number of students who enroll in economics courses greatly exceeds the number of majors, a testimony to the value of learning economics even for non-majors. The introductory courses are taught in a variety of formats, from large sections of as many as 500 students (which are supplemented by small discussion sections led by teaching assistants) to small sections of about 30. Higher-level courses range from 15 to 300 students, with most courses containing 40 to 80.

# Economics

## Prerequisites for Declaring the Major (B.A.)

**1. Complete at least two graded economics courses at the University of Virginia.**

### **2. Economics GPA**

Achieve an economics GPA of at least 2.3 for all economics courses completed.

The economics major GPA is a weighted measure of all 2000 level or higher Economics (ECON) courses taken at the University with the following exceptions:

- a. Grades received in courses taken outside the University's Economics Department, such as transfer courses or direct credit courses offered through study abroad programs, are not included in the economics GPA.
- b. If a student is granted economics elective credit for a course taken in another school or department at the University of Virginia, the grade received in that course is not included in the student's economics GPA.
- c. HIUS 2061 is cross-listed as ECON 2060, and HIEU 2051 was cross-listed as ECON 2050 until Spring 2015. ECON 2060 is (and ECON 2050 was) the same whether taught under the History or Economics numbers. A grade in HIUS 2061 (or HIEU 2051 taken before Spring 2015), therefore, would be included in the economics GPA.
- d. If a student fails a course and then retakes it, both grades – the failing grade and the grade received on the retake – enter into the computation of the economics GPA. If a student has taken and passed a course, grades received on any subsequent retake(s) are not included in the student's economics GPA.

### **3. Calculus**

Complete calculus through calculus II (MATH 1220, MATH 1320, or APMA 1110) with a minimum grade of C+ in the calculus II course.

- a. Students who fail to obtain a C+ on their first attempt are permitted to try to meet the prerequisite a second time. Students who twice fail to obtain a grade of at least C+ in these courses, whether in the same or different courses, are ineligible to declare the economics major. Students considering the concentration in financial economics or graduate work in economics are encouraged to take MATH 1310 and MATH 1320 (or APMA 1110 and APMA 2120) instead of MATH 1210 (or MATH 1212) and MATH 1220.
- b. Pre-matriculation transfer credit or a grade of C+ or above in MATH 2310, MATH 2315, or APMA 2120 will be accepted in lieu of calculus II to fulfill the prerequisite. However, rule 4a still applies. Students who receive a grade below C+ in Calc II and choose to take Calc III instead of repeating Calc II are using up their second chance under rule 4a above. If they receive a grade below C+ in Calc III, they are ineligible for the major.

- c. Students who matriculate at the University with AP or transfer credit for one of the aforementioned calculus II or III courses are exempt from this prerequisite. Transfer credit cannot be used to satisfy this requirement after one has begun taking classes at the University.

#### 4. Intermediate Microeconomics

- a. Complete ECON 3010 (or ECON 3110) with a minimum grade of C+. Students who fail to obtain a C+ on their first attempt at completing ECON 3010 (or ECON 3110) are permitted to retake ECON 3010 (or ECON 3110) once. Those who fail to get a grade of at least C+ in two attempts are not eligible to declare an economics major.
- b. Students who have transfer credit for ECON 3010 at the time that they matriculate at the University are exempt from this prerequisite. Transfer credit cannot be used to satisfy this requirement after one has begun taking classes at the University.

#### 5. Statistics

Complete one of the following courses—STAT 2120, STAT 3120, APMA 3110, APMA 3120—with a minimum grade of C+.

- Students who fail to obtain a C+ on their first attempt are permitted to try to meet the prerequisite a second time. Students who twice fail to obtain a grade of at least C+ in the statistics courses listed above, whether in the same or different courses, are ineligible to declare the economics major.
- Students who matriculate at the University with AP or transfer credit for one of the aforementioned statistics courses are exempt from this prerequisite. Transfer credit cannot be used to satisfy this requirement after one has begun taking classes at the University.

**NOTE:** Students declaring in their 6th semester must have either completed or already be registered for ECON 3720, or ECON 4720 (STAT 3220, if completed before Fall 2013, is also acceptable). Students declaring after their 6th semester must have already completed ECON 3720 or ECON 4720 (STAT 3220, if completed before Fall 2013, is also acceptable).

### Major Requirements

#### Required Courses

Complete five required courses—ECON 2010, ECON 2020, ECON 3010 (or ECON 3110), ECON 3720 (or ECON 4720), and ECON 3020.

- a. Students entering the University with transfer credit for ECON 3010 (or 3020) on their transcript, but do not have credit for ECON 2010 (or 2020), are exempt from ECON 2010 or 2020, respectively. However, they will be required to complete one additional Econ elective; in other words a total of 5 ECON electives must be completed for the major.
- b. Students who completed STAT 3220 before Fall 2013 may use it to meet the ECON 3720 (or ECON 4720) requirement.
- c. Declared majors must complete ECON 2010, ECON 2020, ECON 3010 (or 3110), and ECON 3720 (or 4720) by the end of the sixth semester or they will be dropped from the major. Students wishing to declare an Economics major later than the end of their sixth semester must have already completed all these courses.

### Elective Courses

- Students must complete 4 elective economics courses, each of which must be at least 3 credit hours. At least 2 courses must be numbered 4000 or above and no more than one 2000 level elective. No Economics courses numbered 1000-1999 may be used towards the Economics major.

### GPA

- Students must achieve at least a 2.0 economics GPA in order to graduate.
- Students who finish their sixth semester with an economics GPA below 2.0 will be dropped from the major.

### Declaring the Major

1. Review your student record to make sure you have completed all the prerequisites- the grades must be posted on SIS. If any prerequisites are in progress, you are not yet eligible to declare.
2. Pick up a "Declaration of Major" form from the College of Arts and Sciences (Monroe Hall, Room 101), and fill in all Economics courses taken and currently enrolled.
3. Email the Undergraduate Program Coordinator, in the Economics Department, for an appointment. During your appointment, the Undergraduate Program Coordinator will review your prerequisites, discuss your course plans for the Economics major, and assign you a major advisor.
4. Return the yellow copy to Undergraduate Program Coordinator and take the original (white) copy to the College of Arts and Sciences in Monroe 101 (or your school of enrollment, if not Arts and Sciences), where it is entered into your student record.

**Important: You are not declared until you have completed all four steps.**

### Important Policies

- Certain courses can be transferred towards the major after a student starts at UVA (post-matriculation), however, certain restrictions apply. For more details please see the Transfer Credit section on the Department's website.
- Transfer students must meet all prerequisites. They cannot automatically declare in the major. Third-year transfer students considering the economics major are strongly advised to contact the Undergraduate Program Coordinator before selecting courses.
- No course taken credit/no credit may be used to satisfy major and concentration requirements.
- Students who declare their Economics major after Fall 2011 must complete at least four courses in Economics at the University of Virginia to graduate as Economics majors, whatever transfer credit they may have received for work done elsewhere. For purposes of this rule, any class taught at the University of Virginia in another school or department of the University that is routinely accepted for major credit can be counted towards the total of four courses.

### Concentrations in Economics

- Financial Economics
- Industrial Organization
- International Economics
- Public Policy

The Economics Department offers concentrations in Financial Economics, Industrial Organization, International Economics, and Public Policy.

- Concentrations are **optional**, but economics majors whose interests are heavily focused on one of the following areas may want to declare a concentration.
- Courses taken for a concentration are also considered major electives, unless the course is already specifically required for the major (i.e. Intermediate Microeconomics, Econometrics).
- Students should keep in mind that elective courses applicable to a concentration are not guaranteed to be offered on a consistent basis.
- Concentrations must be declared in the student's 7th term at latest.

Students with questions about a concentration should contact the Undergraduate Program Coordinator.

How to Declare a Concentration:

1. Review your transcript to make sure you have completed all the prerequisites (if any).
2. Email the Undergraduate Program Coordinator for an appointment.
3. The Undergraduate Program Coordinator will provide the required form, which will be filled at the meeting. When this has been finished, you will take the completed paperwork to the College of Arts and Sciences in Monroe 101 (or to your school of enrollment, if it is not Arts and Sciences) where it will be entered into your student record.

### **Concentration in Financial Economics**

#### **Goals**

The concentration aims to provide an academic grounding in financial markets and financial decision making – to teach you how economic theory and econometric methods can be combined to analyze economic phenomena in general and in particular the core issues in financial decision-making. The finance concentration is the most technically challenging of the department's concentrations. It requires a high level of mathematical and econometric knowledge. Students should be very comfortable applying the tools of calculus to applied problems. Students are also expected to be comfortable with computer programming.

#### **Structure**

The concentration is composed of two parts. Students first take a core set of economics courses as well as COMM 201 (financial accounting). These courses provide a broad background in financial economics. These courses have long been offered in the economics department and are taught at a level accessible to all economics majors.

The second part is the preparation for and completion of the capstone course, ECON 4360: Empirical Finance. The pre-requisite for this course is ECON 4720: Introduction to Econometrics. ECON 4720 is needed because ECON 4360 will rely heavily on econometric tools. Half of ECON 4360 will teach students the theoretical basis of the stochastic discount factor (SDF) methodology for pricing assets. The second part of the class will teach students how to use the General Method of Moments (GMM) econometric framework for estimating and testing the validity of a variety of SDF models.

### **Who should take the Finance Concentration?**

The concentration should be of interest to a variety of students. Those who plan to go on to Ph.D. level work in either economics or finance, or masters level work at quantitative finance MBA programs, will benefit from the advanced financial theory and econometric tools we learn and apply. Those who do not have plans for further post graduate study, but who are intellectually curious about finance, will find their curiosity sated. Students heading for quantitative Wall Street jobs will benefit from studying the formal modeling and econometric methods.

### **Notes on Coursework**

Completing the concentration requires that one plan in advance. Because COMM 2010 is generally taken by pre-Commerce students, first and second year students are given priority in registering for the class. You may find it impossible to register for COMM 2010 if you wait until your third year to take it. ECON 4720 must be completed before starting ECON 4360. While linear algebra is not required for the concentration, concepts of linear algebra appear (and are taught) in the context of ECON 4720 and ECON 4360. Students may be required to complete a linear algebra course (MATH 3350 or MATH 3351 or APMA 3080) prior to attempting ECON 4720. benefit from taking MATH 3351 or MATH 3350 beforehand, though this is not required.

### **Prerequisites for Declaring the Concentration**

- Students must complete one course from the following list: ECON 3720, STAT 3120, STAT 3220, APMA 3110, or APMA 3120.
- Complete ECON 4720 (Introduction to Econometrics) with a grade of B or better.

### **Requirements for Completing the Concentration**

In addition to meeting the ordinary requirements for the major, students must:

1. Complete ECON 3030 (Money and Banking)

2. Complete ONE of the following:
  - ECON 4340 (Theory of Financial Markets)
  - ECON 4350 (Corporate Finance)
  - ECON 4365 (Global Financial Markets)
  - ECON 4370 (Behavioral Finance)
  - ECON 4380 (Investment Management)
  - COMM 3720 (Corporate Finance—McIntire School of Commerce – **Commerce and Economics Double Majors Only**)
3. Complete ECON 4360 (Empirical Finance)- This course cannot be taken without having met the above prerequisites for declaring the concentration.
4. Complete COMM 2010 (Financial Accounting—McIntire School of Commerce) COMM 2010 does not count as an economics elective. Economics elective courses such as ECON 3030, ECON 4340, etc., taken to meet finance concentration requirements can be counted as electives towards meeting major requirements.

For more information on the concentration in financial economics, contact the Undergraduate Program Coordinator.

#### **Concentration in Industrial Organization**

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The industrial organization concentration has as its focus the exercise of market power by firms and the strategic interaction between firms. Courses in the concentration use theoretical and empirical analysis to explore a wide variety of issues related to the functioning of markets and related public policies. In combination with the major requirements, the concentration prepares students for careers in business, law, and consulting.

To complete the concentration, students must meet the ordinary requirements for the major, and complete:

1. ECON 4190
2. Any two of the following electives: ECON 4010, ECON 4020, ECON 4170, ECON 4180, ECON 4200, ECON 4390, or ECON 4195

For more information on the concentration in industrial organization, contact the Undergraduate Program Coordinator.

#### **Concentration in International Economics**

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The international economics concentration is designed for ambitious majors with a keen interest in global economic policy. The core course requirements, ECON 4210 and ECON 4220, develop basic literacy in empirical techniques and international economic theory in international trade and macroeconomics. The remaining course electives allow students to specialize further in economic development (ECON 4230, 4610, 4620) or area studies (ECON 3630, 4410). Many

students combine the international concentration with a study abroad program or with the Foreign Affairs major. Recent graduates have gone on to work for international governmental and non-governmental organizations, master's degree programs in international studies or public policy, law school, and business school.

To complete the concentration, students must meet the ordinary requirements for the major and complete:

1. ECON 4210
2. ECON 4220
3. One of the following: ~~ECON 2050~~, ECON 3630, ECON 4230, ECON 4610, ECON 4620 or ECON 4410. For double majors in economics and politics, PLIR 4410 is also accepted as an elective for the concentration.

For more information on the concentration in international economics, contact the Undergraduate Program Coordinator.

### **Concentration in Public Policy**

Economics is highly relevant for public policy as well as private business decisions. Among the topics of interest in microeconomics are the wide range of effects of specific taxes, expenditure programs, and regulations. The courses in the public policy concentration apply general theoretical models for explaining how individuals and organizations respond to changes in their circumstances to predict the qualitative effects of existing and proposed government programs, and they introduce empirical evidence on the quantitative magnitudes of these effects. The concentration also develops the abilities of its students to critically evaluate arguments for particular government actions. It provides majors with the type of training that will enable them to compete successfully for the best junior analyst positions in governments, public policy research firms, and other organizations and for admission into the leading graduate programs in public policy. It should also appeal to students with a strong interest in public policy who intend to pursue careers in related areas such as law.

To declare a concentration in public policy before his or her last year at the University, an economics major must have completed

1. ECON 3010 (or 3110) with a grade of B or better, and
2. ECON 3720 ( or STAT 3220 or ECON 4720) and
3. ECON 4310

To declare the concentration in the second-to-last semester at the University, a major who has satisfied the microeconomics requirement must have completed, or be enrolled in, ECON 4310

To graduate with the concentration, a major must meet the ordinary requirements for the major and complete

1. ECON 4310

2. ECON 4880, and
3. At least two of the following courses: ECON 3040, 3050, 3330, 4080, 4150, 4160, 4180, 4200, 4210, 4220, 4230, 4330, 4420, 4430, ~~4440~~, and 4610, and 4620.

Due to limits on the number of papers that the faculty involved can reasonably supervise in ECON 4880, it is sometimes necessary to limit enrollment in this course and hence the concentration. For more information on the concentration in public policy, contact the Undergraduate Program Coordinator.

### Prerequisites for Declaring the Minor

**1. Complete at least two graded economics courses at the University of Virginia.**

### **2. Economics GPA**

Achieve an economics GPA of at least 2.3 for all economics courses completed.

The economics major GPA is a weighted measure of all Economics courses taken at the University with the following exceptions:

- a. Grades received in courses taken outside the University's Economics Department, such as transfer courses or direct credit courses offered through study abroad programs, are not included in the economics GPA.
- b. If a student is granted economics elective credit for a course taken in another school or department at the University of Virginia, the grade received in that course is not included in the student's economics GPA.
- c. HIUS 2061 is cross-listed as ECON 2060, and HIEU 2051 was cross-listed as ECON 2050 until Spring 2015. ECON 2060 is (and ECON 2050 was) the same whether taught under the History or Economics numbers. A grade in HIUS 2061 (or HIEU 2051 taken before Spring 2015), therefore, would be included in the economics GPA.
- d. If a student fails a course and then retakes it, both grades – the failing grade and the grade received on the retake – enter into the computation of the economics GPA. If a student has taken and passed a course, grades received on any subsequent retake(s) are not included in the student's economics GPA.

### **3. Microeconomics**

Complete ECON 2010 with a passing grade and ECON 3010 (or ECON 3110) with a minimum grade of C+.

Students who fail to obtain a C+ on their first attempt at completing ECON 3010 (or ECON 3110) are permitted to retake ECON 3010 (or ECON 3110) once. Those who fail to get a grade of at least C+ in two attempts are not eligible to declare an economics minor.

- a. Students who have transfer credit for ECON 3010 at the time that they matriculate at the University are exempt from this prerequisite.

- b. ECON 2010 and ECON 2020 are the only courses for the minor that may be taken outside the University after matriculation.

#### 4. Macroeconomics

Complete ECON 2020 with a passing grade.

#### 5. Calculus

Complete Calculus I & II and obtain a minimum grade of C+ in at least one of the calculus courses.

Accepted Calculus I courses: APMA 1090, MATH 1210, MATH 1212, MATH 1190, or MATH 1310

Accepted Calculus II courses: MATH 1220, MATH 1320, APMA 1110

- Students who matriculate at the University with AP or transfer credit for Calculus II are exempt from both parts of this prerequisite.
- Students who matriculate at the University with AP or transfer credit for Calculus I are considered to have met the minimum grade requirement.
- Students who fail to obtain a C+ in Calc I are permitted one retake of Calc I, provided they do so before they take Calc II. No additional Calc I or Calc II retakes are permitted to meet the minimum grade requirement.
- Transfer credit cannot be used to satisfy the grade requirement after one has begun taking classes at the University.
- Students who complete Intermediate Microeconomics before Spring 2016 are not required to complete Calculus II but must still meet the minimum grade requirement.

#### 6. Statistics

Complete one of the following courses—STAT 2120, STAT 3120, APMA 3110, or APMA 3120—with a minimum grade of C+.

- Students who fail to obtain a C+ on their first attempt are permitted to try to meet the prerequisite a second time. Students who twice fail to obtain a grade of at least C+ in the statistics courses listed above, whether in the same or different courses, are ineligible to declare the economics minor.
- Students who matriculate at the University with AP or transfer credit for one of these courses are exempt from this prerequisite. Transfer credit cannot be used to satisfy this requirement after one has begun taking classes at the University.

#### Minor Requirements

No course taken credit/no credit may be used to satisfy minor requirements.

#### Required Courses

Complete all the prerequisite courses for declaring a minor; ECON 2010, 2020, 3010 (or 3110), Calculus, and Statistics.

### **Elective Courses**

The student must complete an additional 3 Economics elective courses at the 2000 level or above, each of which must be at least a 3 hour course.

- Of the economics elective courses used to satisfy this requirement, no more than one can be numbered below 2999.
- At least two of the three Economics elective courses must be completed at the University.
- ECON 3720, ECON 4720, and ECON 3020 can count as electives in the minor.
- Students entering the University with transfer credit for ECON 3010 (or 3020) on their transcript, but who do not have credit for ECON 2010 (or 2020), are exempt from ECON 2010 or 2020, respectively. However, they will be required to complete one additional Econ elective; in other words a total of 4 ECON electives must be completed for the minor.

### **GPA**

Students must have a cumulative economics GPA of at least 2.0 to graduate with the minor. See the prerequisites for details on computing the economics GPA.

### **Declaring the Minor**

College rules require that the minor be declared by the end of the add period in the semester before graduation, ordinarily the seventh semester. Under some circumstances this deadline may be extended until early in the semester in which you intend to graduate.

1. Review your transcript to make sure you have completed all the prerequisites.
2. Email the Undergraduate Program Coordinator for an appointment.
3. The Undergraduate Program Coordinator will provide the required form, which will be filled at the meeting. When this has been finished, you will take the completed paperwork to the College of Arts and Sciences in Monroe 101 (or to your school of enrollment, if it is not Arts and Sciences) where it will be entered into your student record.

### **Distinguished Majors Program**

The Distinguished Majors Program brings the best undergraduates together in their fourth year to learn from each other, enter the intellectual life of the Department of Economics, discover the nature of research in economics, and write a thesis. Applications are due in March of the student's third year. Applicants should have a strong overall academic record, with a cumulative grade point average in economics that is at least 3.6 at the time of application.

Specific requirements of the program include:

1. Each student must take the Distinguished Majors Seminar (ECON 4990) in the fall of the fourth year.

2. Each student will complete a DMP thesis (ECON 4999), independent research under the supervision of an economics faculty member. The thesis is due in April.

Department recommendations for Distinction, High Distinction, and Highest Distinction will be based on:

- a. quality of the thesis
- b. overall work in the Distinguished Majors Program,
- c. overall work in economics,
- d. overall college record.

## Contact Information

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The Department of Economics is located in Monroe Hall. The mailing address is P.O. Box 400182, Charlottesville, VA 22904-4182. The department's web address is [www.virginia.edu/economics](http://www.virginia.edu/economics). If you have further questions about undergraduate study in economics, please contact the Undergraduate Program Coordinator or the Director of Undergraduate studies ([econ-dus@virginia.edu](mailto:econ-dus@virginia.edu)).

## Course Descriptions

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- ECON 2010 - Principles of Economics: Microeconomics Credits: 3
- ECON 2020 - Principles of Economics: Macroeconomics Credits: 3
- ECON 2060 - American Economic History Credits: 3
- ECON 3010 - Intermediate Microeconomics Credits: 4
- ECON 3020 - Intermediate Macroeconomics Credits: 3
- ECON 3030 - Money and Banking Credits: 3
- ECON 3040 - The Economics of Education Credits: 3
- ECON 3050 - The Economics of Welfare Reform Credits: 3
- ECON 3070 - Economics and Gender Credits: 3
- ECON 3110 - Mathematical Microeconomics Credits: 4
- ECON 3330 - Public Choice Credits: 3
- ECON 3630 - Economics of the Middle East Credits: 3
- ECON 3720 - Introduction to Econometrics Credits: 4
- ECON 4010 - Game Theory Credits: 3
- ECON 4020 - Auction Theory and Practice Credits: 3
- ECON 4060 - Economics of Sports Credits: 3
- ECON 4080 - Law and Economics Credits: 3
- ECON 4090 - Mathematical Economics Credits: 3
- ECON 4100 - Managerial Economics Credits: 3
- ECON 4150 - Economics of Labor Credits: 3
- ECON 4160 - Economics of Health Credits: 3
- ECON 4170 - The Economics of ~~Information and Uncertainty~~ Risk, Uncertainty, and Information Credits: 3
- ECON 4180 - Regulating Infrastructure Credits: 3
- ECON 4190 - Industrial Organization Credits: 3

- ECON 4195 – Empirical Industrial Organization Credits: 3
- ECON 4200 - Antitrust Policy Credits: 3
- ECON 4210 - International Trade: Theory and Policy Credits: 3
- ECON 4220 - International Finance and Macroeconomics Credits: 3
- ECON 4230 - Seminar on Trade and Development Credits: 3
- ECON 4310 - Economics of the Public Sector Credits: 3
- ECON 4330 - Economics of Taxation Credits: 3
- ECON 4340 - The Theory of Financial Markets Credits: 3
- ECON 4350 - Corporate Finance Credits: 3
- ECON 4360 - Empirical Finance Credits: 3
- ECON 4365 – Global Financial Markets Credits: 3
- ECON 4370 – Behavioral Finance Credits: 3
- ECON 4380 - Investment Management Credits: 3
- ECON 4390 - The Economic Theory of Advertising Credits: 3
- ECON 4400 - Topics in Economic History Credits: 3
- ECON 4410 - Economics of the European Union Credits: 3
- ECON 4420 - Macroeconomic Policy Credits: 3
- ECON 4430 - Environmental Economics Credits: 3
- ECON 4440- Economic Inequality Credits: 3
- ECON 4590 – Majors Seminar Credits: 1 to 3
- ECON 4610 - Economic Development Credits: 3
- ECON 4620 - Seminar on Development Economics Credits: 3
- ~~ECON 4660 – Economy of Japan Credits: 3~~
- ECON 4710 - Economic Forecasting Credits: 3
- ECON 4720 - Econometric Methods Credits: 3
- ECON 4810 - Advanced Macroeconomic Theory Credits: 3
- ECON 4820 - Experimental Economics Credits: 3
- ECON 4880 - Seminar in Policy Analysis Credits: 3
- ECON 4995 - Supervised Research Credits: 1 to 3
- ECON 4990 - Distinguished Majors Seminar Credits: 3
- ECON 4999 - Distinguished Majors Thesis Credits: 1 to 3

**Forum: Food, Society and Sustainability**

Manuel Lerdaу, Departments of Biology and Environmental Sciences

Paul Freedman, Department of Politics

January 6, 2017

Of the necessities that sustain us, food plays a central, and special, role. Food is something we both grow and create, something we consume and reflect upon. Food is central to our cultural and physiological metabolisms, something that both ties us to the natural world and represents our identities as cultural creatures who, alone among organisms, use accumulated knowledge to create the art and technic of our lives. Food is a tool used by governments to manipulate and control the governed. An offering of food is sign of peace, affection or reverence, while withholding of food is an act of violence or war. Food, more than any other part of human life, bridges together our evolutionary past, our social present, and our cultural future.

This Forum uses food as a vehicle to explore grand questions such as what it means to be human and how our humanity depends upon and can be freed from our biology. The Forum also examines the role of food as a cultural artifact, a political and military tool, and a semi-natural phenomenon that has contributed to the greatest change on the Earth's surface since the ice ages.

The study of food is one that encompasses all aspects of the liberal arts; this Forum will include courses in Biology, Environmental Sciences, Anthropology, Religious Studies, Philosophy, Politics, Economics and Literature. (Outside the College, there are related courses in Public Policy, Architecture, Public Health and Engineering.) Our first-year Forum seminar will examine in detail food from a multi-disciplinary perspective that considers both the diversities in food systems and their unifying features. We will explore the processes, networks, policies, workers and animals that together bring food from field to table; from planting, processing, and packaging, to distribution, marketing and sales, and finally consumption and waste disposal. We will look at how these processes play out at local, national, and global scales, and consider questions of ethics and notions of justice implicated by food systems and food politics.

Because of food's intimate link to the bio-geophysical world, and the strong relationships among production and consumption practices and long-term human survival, the Forum will also emphasize what is involved with sustainable food production, distribution, and consumption within the norms of different cultures. We will therefore investigate how politics and policies interact with and shape cultural

Rachael Mast (from MH) 1-17-17

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understandings, personal and public health, and biological and ecological systems. We will pay special attention to how food production has both contributed to and is threatened by climate change.

The Forum will also provide an opportunity for students to connect with area non-profit organizations working on issues related to food, agriculture, public health, and food justice. The Charlottesville-Albemarle region is rich with community-based efforts to shape and improve the local food system, and we will leverage our existing contacts and connections to create opportunities for students to participate in and learn from these efforts, including internship possibilities. At the same time, students will have the opportunity to learn about and participate in the University's own food system, working with U.Va. Dining and the University's Sustainable Food Strategy Task Force.

We are well qualified to design and teach this Forum. We regularly teach courses on food politics, agricultural, and sustainability; we are founding members of the U.Va. Food Collaborative, we have worked together at the Morven Summer Institute, and have served on the University's Committee on Sustainability.

### Course Work

#### Forums & Required Classes: 17 credits

- FORU 1500 (Fall 2017): 3 credits
- FORU 1510 (Spring 2018): 1 credit
- FORU 1510 (Fall 2018): 1 credit
- FORU 2500 (Spring 2018): 3 credits
  
- ECON 2010: Principles of Economics: Microeconomics
- EVSC 2220: Conservation Ecology: Biodiversity and Beyond
- MATH 1210 OR higher OR STATS 1120 or higher

#### Category 1: 6 credits

#### Choose 2 Classes

AAS 3749: Food and Meaning in Africa and the Diaspora

AMST 2753: Arts and Cultures of the Slave South

GDS 3820: Global Ethics & Climate Change

PHIL 3650: Justice and Health Care

PHIL 3652: Animals and Ethics

RELC 3795: Theology, Spirituality and Ethics of Sustainability

~~RELC 5155: Ecology, Christianity, and Culture~~

RELG 2210: Religion, Ethics, and the Global Environment  
 RELG 3380: Feasting, Fasting and Faith: Food in Judaism and Christianity  
 WGS 3680/ITTR 3680: Eve's Sinful Bite: Foodscapes in Women's Writing Culture and Society  
 PHIL 2720: Bioethics: A Philosophical Perspective  
 PHIL 2690: Justice, Law, and Morality  
 PHIL 2450: Philosophy of Science  
 PHIL 1740: Issues of Life and Death  
 PHIL 1730: Introduction to Moral and Political Philosophy

**Category 2: 6 credits**

**Choose 2 Classes:**

PLAP/GSVS 3160: Politics of Food [recommended]  
 ANTH 2190: Desire and World Economics  
 ANTH 2280: Medical Anthropology  
 ANTH 2291: Global Culture and Public Health  
 ANTH 3130: Disease, Epidemics and Society  
 ANTH 3240: The Anthropology of Food  
 ANTH 3325: Capitalism: Cultural Perspectives  
 ANTH 3340: Ecology and Society: An Introduction to the New Ecological Anthropology  
 EVSC/PLAP 2030: Politics, Science, and Values: Intro to Environmental Policy  
 EVSC/PLAP 4030: Environmental Policymaking in the United States  
 GDS 2291: Global Culture and Public Health  
 GDS 3112: Ecology and Globalization in the Age of European Expansion  
 GSVS 2150: Global Sustainability  
 PHS 3050: Introduction to Public Health  
 PHS 3090: Health Care Economics  
 PHS 3095: Health Policy in the US - An Economic Perspective  
 PHS 3620: Built Environment & Public Health: Local to Global  
 PLAP 4800: Politics of the Environment  
 PLAP 4810: Class, Race, and the Environment  
 PLIR 4310: Global Health and Human Rights  
 SOC 3700: Health and Society  
 WGS 2450: Gender and Environmental Justice

**Natural Science/Math: <sup>at least</sup> 3 credits**

**Choose 1 Additional Class:**

BIOL 1060: Principles of Nutrition

BIOL 1210: Human Biology and Disease  
EVSC 1010: Introduction to Environmental Sciences  
EVSC 1080: Resources and the Environment  
EVSC 1200: Elements of Ecology  
EVSC 1450: An Inconvenient Truce: Climate, You and CO2  
EVSC 2200: Plants, People and Culture  
EVSC 3200: Fundamentals of Ecology  
EVSC 3201: Fundamentals of Ecology Laboratory  
EVSC 4040: Climate Change: Science, Markets & Policy

## Course Tag Changes

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### PHYS 3040 – Physics of the Human Body

**Proposal:** Add “Living Systems tag” and remove “Chemical, Physical, Mathematical”

**Rationale:** I (Jongsoo Yoon) am the course instructor of PHYS 3040 (Physics of Human Body), and writing this to petition that the best suited designation of the course is the Living Systems.

By specifying pre- and co-requisites, the course PHYS 3040 is offered only to those students who have already taken or are completing calculus-based introductory physics courses. The focus of the course is on guiding students to learn how to use and apply physics concepts and principles to understand how living systems work and interact with the environment, not on teaching physics laws and principles themselves which they have already learned from the pre-requisites. A list of course topics is included in this letter for your reference. The course material is assembled from many biology-related books and articles; to name a few,

- Physical Biology of the Cell (by Rob Philips, Jane Kondev, and Julie Theriot),
- Physiology of Behavior (by Neil R. Carlson),
- Discovering Biological Psychology (by Laura A. Freberg),
- Biological Physics (by Philip Nelson),
- *Methods of blood flow measurement in the arterial circulatory system*, Reza Tabrizchi and Michael K. Pugsley, Journal of Pharmacological and Toxicological Methods Vol. 44, 375-384 (2000),
- *On the Cable Theory of Nerve Conduction*, Ichiji Tasaki et al., Bulletin of Mathematical Biology, Vol. 64, 1069-1082 (2002),
- *Why not walk faster?* James Richard Usherwood, Biology Letters, Vol. 1, 338-341 (2005),
- *The role of phase synchronization in memory processes*, Juergen Fell and Nikolai Axmacher, Nature Reviews; Neuroscience, Vol 12, Feb. 105-118 (2011).

The source material is chosen in consultation with biologists, cognitive neuroscientists, and medical doctors as needed. However, none of the books has sufficient overlap with the entire course material to warrant as a textbook, and the course is offered without a specific textbook.

To further illustrate the course material and class discussion, I take the example of Chapter 2 that covers neurons, neural signals, and neural signal transmission. For the first three sub-sections, power point slides are used (they are included in this letter) to go over the anatomy of neurons and basic mechanisms involved in the neural signal generation. In the sub-section 2-4, we use a simple electric circuit analysis based on Kirchhoff's circuit rule and Ohm's law (which are taught in the pre-requisite classes) and derive an equation describing the signal transmission along unmyelinated axons. By analyzing the equation, together with the understanding on the signal transmission mechanism along myelinated axons (which is the topic of the sub-section 2-6), we calculate that the optimum length of a segment of myelin sheath must be  $\sim 0.7$  mm, which is fully consistent with the observation that a segment of myelin sheath is typically  $\sim 1$  mm. In this chapter, students learn and understand why most of the axons in the human body are

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Curriculum Development

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myelinated, and also why the axons in many invertebrates are very large in diameter (compared with the typical axons in mammals).

All other chapters are taught with the same basic idea; the introductory part covers basic anatomy of the topic system and overview of the basic mechanisms involved in the functioning of the system. Then we use physics laws and principles to understand how the system works quantitatively wherever it is possible.

Because the focus of the course PHYS 3040 is on understanding how living systems work and interact with the environment (which is precisely the description of the course designation of the Living Systems), not on the material composition and mathematical structure of the physical system (which is the description of the course designation of the Chemical, Mathematical, & Physical Universe), I am petitioning that the course PHYS 3040 is designated as the Living Systems.

## Syllabus: Physics 3040 (Spring 2016), Physics of Human Body

**Instructor:** Jongsoo Yoon (office: room 063, email: jy2b@virginia.edu, phone : 982-2197)  
Office hour: Wednesdays 11:00am – 1:00pm, or by appointment

**Grader:** Zack Carson (zack.carson@virginia.edu)

### Reference books

There is *no required textbook* for the class. There are many reference books reserved in the physics library for the class. The most useful book for the class would be the textbook of introductory level physics class, equivalent to PHYS 1710-1720 series, 2010-2020 series, 1425-2415 series, or 1610-1620-2610 series. It is expected that you have the textbook of the introductory level physics class that you took.

### Course Description

The main aim of this course is to learn how to use the physics concepts and principles taught in the introductory level physics class to understand various phenomena and functioning of our body. The subjects we discuss include body motion such as walking, running, and pitching, neurons and neural signal, learning and memory, thermal balance and hypothermia, blood circulation and atherosclerosis, lungs and breathing, and vision.

### Homeworks, Exams, and Term Paper

- **Homeworks**  
There will be approximately 10 weekly homeworks. You are allowed to do the homework assignments in groups, but each student has to submit his/her own homeworks.
- **Exams**  
There will be two in-class exams, *tentatively* scheduled  
exam 1 on **Thursday, March 3**, and  
exam 2 on **Tuesday, April 26**.  
(The date will be finalized and announced at least one week before the exam date.)  
**Bring a calculator (for scientific calculations) to the exam. You may bring one sheet of note to each exam.**
- **Term Paper**  
There will be a term paper in place of final exam. You should choose a natural phenomenon, and apply physics principles to understand/describe the underlying mechanisms. The paper should describe, in detail, the phenomenon, how and what physics principles and equations are used to understand the phenomenon, and show all calculations and mathematical derivations involved in detail. You are allowed to work in a group, but the group should involve ***4 students or less***. If you work in a group, you still have to ***write and submit your own*** term paper (no group paper) and specify ***the names and UVA computing IDs of all the students in the group***. You are required to submit **both hard copy and the electronic version (MS-word or pdf file only)**. The term paper should be submitted on or before **Tuesday, May 3**.

### Grading

Grading will be based on homeworks, two in-class exams, and the term paper as following;

- 20% = homeworks
- 30% = exam 1
- 30% = exam 2
- 20% = term paper