

## **About This Online Catalog**

This online catalog supersedes all previous Catalogs and academic regulations and is binding on all students. It was prepared on the basis of the best information available at the time of publication. The University reserves the right to change tuition, fees, course offerings, regulations, and admission and graduation requirements at any time without prior notice.

## **Calendar**

Yeshiva University operates on a semester system. The school year starts at the end of August (early September) and finishes in early August of the next calendar year. The M.Q.E. fall term begins in late August and ends at the end of December of the same calendar year. The spring term starts in January and generally concludes toward the middle of May. The summer semester starts at the end of May and ends at the beginning of August.

The University is not responsible for interruptions beyond its control.

## **Equal Opportunity**

The University is committed to a policy of equal opportunity and nondiscrimination in admission and all other facets of its educational programs and activities. The University encourages applications from qualified students regardless of sex, religion, age, race, disability, marital status, sexual orientation, color, or national origin, within the meaning of applicable law.

Inquiries concerning the University's nondiscrimination policies may be referred to the Affirmative Action Administrator, Yeshiva University, Jack and Pearl Resnick Campus, 1300 Morris Park Avenue, Bronx, NY 10461-1602 att: Renee Coker, Diversity & Affirmative Action Officer – (718) 430-3771

## **Accreditation**

Yeshiva University is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104, (215)662-5606. The Commission on Higher Education is an institutional accrediting agency recognized by the US Secretary of Education and the Commission on Recognition of Postsecondary Accreditation.

## **Yeshiva University**

Yeshiva University, in its second century, is an independent institution under Jewish auspices chartered by the State of New York. It is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools and by specialized professional agencies. It offers programs leading to associate's, bachelor's, master's, doctoral, and professional degrees.

In addition to its extensive teaching programs, the University maintains a network of affiliates, conducts widespread programs of research and community outreach, and issues publications.

The University's thousands of graduates are found throughout the US and overseas, in every profession. Among its alumni are judges, university professors and presidents, religious leaders, business executives, government officials, artists, writers, doctors, and scientists. The University's roster of honorary degree recipients includes Nobel laureates, world political leaders, philanthropists, and other individuals committed to the betterment of society.

### **Mission**

The University's guiding vision is the confidence that the best of the heritage of contemporary civilization—the liberal arts and sciences—is compatible with the ancient traditions of Jewish law and life. On the undergraduate level, this belief is embodied in the dual curriculum under which students pursue a full program of Jewish studies while taking college programs in the liberal arts and sciences and business and receiving specialized preparation for advanced work in a discipline or profession. On the graduate level, the University emphasizes the moral dimensions of the search for knowledge and the ethical principles that govern professional practitioners.

Yeshiva University is also committed to the love of learning for its own sake (known in Jewish tradition as Torah Lishmah) and to teaching and research that stress a striving for excellence.

A third goal of the University is to serve the general and Jewish communities of the city, the nation, and the world by preparing well-trained professionals in several fields and providing pioneering resources for community service.

### **History**

Yeshiva University traces its origins to Yeshiva Eitz Chaim, founded in 1886 on New York's Lower East Side. In 1896 Rabbi Isaac Elchanan Theological Seminary (RIETS) was founded there; it was chartered in 1897 by the New York State Board of Regents. In 1915 the two schools merged.

Under the leadership of Dr. Bernard Revel, who served as president from 1915 until his death in 1940, the institution embarked on a plan of educational development and growth. In 1929 the institution moved to its Main Campus in Manhattan's Washington Heights. Liberal arts programs began with the establishment of Yeshiva College in 1928, and the first graduate curriculum (in Jewish studies) was introduced in 1935.

The election of Dr. Samuel Belkin as president in 1943 inaugurated a new era of expansion. University status was granted in 1945 by the New York State Board of Regents. The institution initiated programs of general and professional studies, research, and special projects to benefit many constituencies. These included a college of liberal arts and sciences for women and graduate schools of medicine, law, social work, and psychology.

Dr. Norman Lamm was elected president in 1976, following Dr. Belkin's death. He undertook a complete review of the University's structure and operations and significantly expanded undergraduate study opportunities to include, among other things, a new undergraduate school of

business. He also enriched graduate and professional school resources and established a carefully monitored fiscal system and development program to further the University's goals.

### **Facilities**

The University's undergraduate, graduate, and professional schools are located in Manhattan (Main Campus, 500 West 185th Street; Midtown Campus, 245 Lexington Avenue; Brookdale Center, 55 Fifth Avenue) and the Bronx (Jack and Pearl Resnick Campus, Eastchester Road and Morris Park Avenue).

### **Libraries**

The University's four-campus library system houses some 1.1 million volumes, 1.3 million microforms, and 10,900 journals and serial publications in the arts and sciences and Judaica. It is a selective depository for US Government publications.

The Mendel Gottesman Library—a six-story, block-long central library building at the Main Campus—houses the Pollack Library, Landowne-Bloom Library, and Mendel Gottesman Library of Hebraica-Judaica. The Hedi Steinberg Library, serving undergraduates, Azrieli Graduate School of Jewish Education and Administration, and some programs of Wurzweiler School of Social Work, is at the Midtown Campus. The Dr. Lillian and Dr. Rebecca Chutick Law Library of Benjamin N. Cardozo School of Law is at the Brookdale Center, and the D.Samuel Gottesman Library of Albert Einstein College of Medicine and Ferkauf Graduate School of Psychology at the Resnick Campus.

Electronic resources at the libraries include bibliographical and statistical databases, indexes and abstracts, journals on line, and journal article full text services.

The University-wide computer network provides email as well as access to Yeshiva University libraries, the Internet, and other network-based services. Technical support is available at regular office hours to help students requiring assistance in utilizing computer services.

### **Special Collections**

The University's Rare Books and Manuscripts Division contains several thousand rare Judaica and Hebraica volumes, 39 Hebrew incunabula (books printed before 1500), and over 1,000 literary and historical manuscripts. The Archives document the University's history as well as the activities of important Jewish organizations and individuals.

### **Affiliations**

Since 1974 the University's libraries have participated in OCLC, a computerized bibliographic network of more than 30,000 libraries in 65 countries. Members of this shared online system have access to 38 million catalog records and can borrow materials from OCLC libraries by generating online requests.

The library system is a member of METRO, the Metropolitan Reference and Research Library Agency. Students with legitimate research needs gain entry to all METRO member-libraries by requesting a METRO card.

Through special membership in the Research Libraries Group, the libraries participate in RLIN, the Research Libraries Information Network, in cooperative projects among libraries with Hebraica collections and in programs for preservation of library materials.

Each University library maintains affiliations with agencies devoted to its particular specialty, such as Jewish studies, social work, law, and medicine.

### **Computer Facilities**

Yeshiva University, recognizing the increasing role of high technology, continually enhances its computer facilities and services. A wide area network (WAN) links computer resources on all YU campuses, yielding access to such resources as the online catalog and mini-MEDLINE systems at Albert Einstein College of Medicine as well as all Internet-based resources worldwide, with library computers offering menu-driven search capabilities.

## **Master of Science in Quantitative Economics (MQE)**

In addition to its graduate-level professional programs, Yeshiva University offers graduate programs in the arts and sciences. Currently the two disciplines in which advanced degrees are offered are economics and mathematics. The master's programs are designed to produce specialists for industry, to prepare students for doctoral programs in the two disciplines and to supplement strong undergraduate programs in both areas. All first-year graduate courses are open to suitably prepared undergraduates. The Master of Arts and doctoral programs offered by the Department of Mathematical Sciences are ongoing and continue a distinguished tradition in graduate science education at Yeshiva University. The Master of Science in Quantitative Economics (MQE) commenced in the Fall of 2012.

All programs are registered by the New York State Education Department and meet its educational requirements.

### **Yeshiva University Economics Dept. Faculty (Year 2015-2016)**

(Not all faculty members are directly associated with the MQE)

Omer Acikgoz, Assistant Professor of Economics

Gaetano Bloise, Professor of Economics

Alessandro Citanna, Professor of Economics, M.Q.E. Program Director

William Hawkins, Assistant Professor of Economics

James A. Kahn, Henry and Bertha Kressel University Professor of Economics, Dept. Chair

Ran Shao, Assistant Professor of Economics

Tadashi Hashimoto, Assistant Professor of Economics

### **Program Director**

A program Director coordinates and has administrative responsibilities for the overall program. That individual determines, consulting with the program faculty and in compliance with university standards, the policies, procedures, and curriculum for the program.

### **Location**

The main faculty offices of the Yeshiva University Economics Department are located on the 7<sup>th</sup> floor at 215 Lexington Avenue, on Yeshiva University's Beren Campus in midtown Manhattan. Most MQE classes are held at the Beren Campus. Some classes, particularly those held in conjunction with the YU Mathematics Department, may be held at the University's Wilf Campus in Washington Heights.

## **General Obligations**

It is the responsibility of each student to be familiar with and to comply with all rules, regulations and standards, to pay all fees and charges, and to meet the specific requirements of any course for which s/he is enrolled, including prerequisites and co-requisites wherever required.

## **Maintenance of Academic Standards**

Students are required to maintain satisfactory standards of scholastic performance, including a 3.3 average. A student who, during a semester, fails a course or receives an average below 3.3 or an excessive number of Incompletes is placed on academic probation for the following semester. If in any subsequent semester another course is failed, or below-3.3 average or Incompletes are received, the student may be dropped from the School at the discretion of the program Director. Students in the MQE program must have a minimum average of 3.3 to receive their degree.

## **Performance Review**

When students are on probation, a faculty committee appointed by the Director reviews their performances and determines whether withdrawal is required. The committee will develop a remediation plan for those permitted to continue at the School. Should a grade of C or less be obtained in a required course, the student may be allowed to repeat the final examination for that course; in this case, the student will not be able to receive a grade above B- for that course. Should a grade of C or below be obtained in an elective course, the student may select an additional elective. No student with more than one failed course is permitted to continue the program, or to receive the degree.

## **Status**

Students are expected to maintain full-time status, defined as 12 credits per semester, for the first two semesters of the program, followed by their final essay or internship in the summer following the academic year. Students must maintain continuous registration in the MQE until graduation (normally within one year.)

## **Grades**

The work of each student is graded on the following basis:

A+ Outstanding	B Adequate
A Excellent	B- Just Adequate, Borderline
A- Very Good	C Well Below Level
B+ Good	F Failing

Where coursework, with permission, extends beyond one semester, the following grades may be used: X Course in progress; Y Year course; second-term grade applies to both terms (changed to I if the student does not register for the second term).

## **Academic Average**

Each grade has a numerical value, as follows:

A+ 4.334	B 3.0
A 4.0	B- 2.667
A- 3.667	C 2.0
B+ 3.334	F,G 0

When the numerical value is multiplied by the credit value of the course, the resulting figure is known as the number of quality points. The student's average rating is computed by dividing the number of quality points earned by the number of credits completed, including courses failed. The average is rounded to the third decimal place.

Grades achieved at other institutions are not averaged in with the student's record at Yeshiva University; only credit is granted on transfer.

All coursework must be completed by the end of the semester in which the course is taken. A mark of I (Incomplete) cannot be carried for more than one semester.

Full details of the required minimum standards of good academic standing and satisfactory progress are available in the Office of the Registrar.

## **Transfer of Credit**

Credit for work completed at another institution of higher education is not automatically granted; the program Director and the Office of the Registrar must approve its acceptability and its appropriateness to the degree sought at the School.

No credit is given for any course transferred from another institution with a grade below B or a P grade, nor for any subject which is technical or commercial, or in any way not ordinarily classified as a liberal arts subject.

Students who are admitted into the Program and are requesting transfer credits are required to submit course syllabi from their prior graduate training for evaluation. After careful review by the program Director, the applicant will be informed of the number of credits that have been accepted toward this program.

No credit is allowed for any courses completed more than 10 years before the date of application for advanced standing, whether or not the credit was earned toward a formal degree.

Students who have taken courses at other graduate institutions and wish to apply for transfer of credit must do so by filing an Application for Transfer Credit Toward a Graduate Degree form during their first semester in attendance. Regulations and procedures are available in the Office of the Registrar.

All official actions concerning transfer of credit are taken by the registrar after all records are checked and subsequent to written approval by the Provost.

Students already in attendance may take courses at other institutions or at other schools of Yeshiva University only under very special circumstances and only after they have received written permission from their program Director and the Office of the Registrar. Requests for such permission are to be made on the Request for Permission for Graduate Work at Other Schools form available from the Office of the Registrar. Such credits are counted as transfer credits and are subject to all the above regulations.

### **Residence Requirement**

So that each student has adequate contact with the School and its faculty, all research, reading, directed study, and dissertation credits must be taken at the School, and no more than 6 credits toward the master's degree may be transferred from other institutions, with the approval of the program Director.

### **Continuous Registration**

Students must maintain continuous registration in the MQE until graduation (normally within one year.)

### **Time Limitations**

A student must complete the requirements for the master's degree within one year. Students who go beyond this limit may be dropped from the School. If permitted to continue, they may be required to take additional, more current, coursework.

### **Official Withdrawal**

A student who is withdrawing from the University and does not expect to return at some future date should fill out an Application for Official Withdrawal form, available in the Registrar's Office. Completion of this form is necessary for the student's record to bear the notation that an official withdrawal was granted. (A student who plans to return at some future date should instead file a Request for a Leave of Absence form; see description below.)

### **Leaves of Absence**

Please note that under current Immigration and Naturalization Service regulations, foreign students in F-1 classification are not permitted to be on leave of absence.

Students who are not taking any coursework but who expect to return at some future time should file a Request for Leave of Absence for Graduate Student Form, available in the Office of the Registrar. Such leaves are normally granted for a maximum of 12 months. (If the student is entering full-time service in the armed forces or in ACTION, Peace Corps, and VISTA, no charge will be made for the leave during the period of actual service.) Sympathetic consideration will be



given to a request by a student returning from an official leave who wishes to continue a course of study under the requirements in force at the time the leave was granted. Leaves of absence, except for the purpose of government service, do not extend the time limits set for completion of degree requirements.

A student who neither registers nor secures an official leave of absence for any semester will be considered as having withdrawn from the School. A student who wishes to resume studies will be required to apply for readmission.

## **Graduation**

Degrees are generally awarded on September 30, but under certain circumstances may be awarded on January 31, or June 30 of the following calendar year. A student applies for a degree by filing an Application for Graduation form by a given date during the semester prior to anticipated graduation. Final dates for filing are listed in the Academic Calendar.

Should the degree not be awarded during that term, a new application must be filed every term until the degree is awarded. Graduation fees paid initially remain valid for an additional three consecutive semesters and need not be paid again unless more than two years elapse between payment and award of degree.

## **Records and Transcripts**

In accordance with the provisions of FERPA, a transcript is not issued without the student's written request, except in a few circumstances in which the law allows or requires a transcript to be sent without the student's permission. Details are given in the University's FERPA policy statement, a copy of which may be obtained as described under Privacy Rights, above.

Records of students are sent only in the form of a transcript. No partial records are sent, nor ones listing only courses without grades.

The fee for a transcript must be paid in advance (refer to Tuition and Fees section of this Catalog). A transcript is not issued for a student who has an overdue debt to the University or has failed to return all books to its libraries.

A student who wishes to change either a first or last name on School records must file a Request for Change of Name on School Records form in the Office of the Registrar.

A student who believes that there is an error in his or her academic record (e.g., in a grade, average, credit value, or course description) must promptly call this to the attention of the Office of the Registrar. Even if there has been a mistake on the part of the University, no request for a correction will be considered unless the student notifies the Office of the Registrar within three months.

## **Diplomas**

Duplicate or revised diplomas can be secured under certain circumstances determined by the standards accepted by American universities. Full information is available in the Office of the Registrar.

## **Change of Address**

Students who change their home or local residences are required to notify the Office of the Registrar of the change of address within 10 days by filing a Notification of Change of Address, available in the Office of the Registrar. A student is responsible for all mail sent to the old address if the University has not been so notified.

## **Privacy Rights**

In accordance with the provisions of the Family Educational Rights and Privacy Act of 1974, as amended (Section 438 of the General Educational Provisions Act, 20 USC 1232g), also known as "FERPA," Yeshiva University has adopted certain policies to protect the privacy rights of its students with respect to their education records. FERPA affords students certain rights of access to their education records. FERPA also limits the persons to whom the university may disclose a student's education records and permits certain disclosure without the student's written permission. Please visit the Office of the Registrar or its Web site to obtain the Yeshiva University FERPA Policy Statement.

## **Student Responsibility**

It is the responsibility of each student to ensure that all regulations have been observed, all fees paid, and all course requirements met, including prerequisites whenever required. The degree candidate should note that completion of the specified number of credits does not in itself satisfy degree requirements.

## **Use of the University's Name**

No student or student organization may use the name of Yeshiva University for any purpose, including identification, without written permission from the Office of the Provost.

## **Injuries**

All injuries and accidents to students while engaged in classroom work will be reported by the faculty member in charge of the course. Students are required to report immediately to the Office of the Provost any other injury suffered on School premises.

## **Academic Discipline**

A student's admission, continuance on the rolls of the School, receipt of academic credits, graduation, and the conferring of any degree, diploma, or certificate on the student are entirely

subject to the disciplinary powers of the School and to the student's maintaining high standards of ethical and scholarly conduct. The School is free to dismiss the student at any time for infringement of these standards.

### **Student Information**

False or misleading statements on admission, registration, scholarship application, or other School forms, or records dealing with outside employment, attendance at other institutions, financial status, departmental or degree requirements, visa status, or any other items of student information requested by the School may result in disciplinary dismissal.

### **Academic integrity and Ethical and Professional Standards in Graduate Study**

The submission by a student of any examination, course assignment, or degree requirement is assumed to guarantee that the thoughts and expressions therein not expressly credited to another are literally the student's own. Evidence to the contrary will result in penalties which may include failure in the course, disciplinary dismissal, or such other penalties as are deemed proper.

Graduate study requires excellence of intellect. Graduate students are expected to show seriousness and intellectual dedication, respect for the views and convictions of others, concern for the impact of advanced knowledge on society at large, regard for instructors, fellow students, and the School as a whole and, above all, adherence to the highest ethical and moral standards in their personal and professional lives.

Maintenance of good standing, while being a student at the School is, in part, dependent on developing and maintaining standards of ethical and professional conduct. Failure to maintain these standards may lead to dismissal from the School.

### **Attendance**

Regular class attendance is required as a condition of receiving credit for courses. Any student who is not in regular attendance for a course may be prohibited from taking the exam and/or receiving a passing grade for that course. If the instructor denies a student permission to take the exam because of failure to attend classes regularly, the student shall receive a grade of "F," "N," "G," or "W" at the discretion of the program Director. Each instructor may supplement this general attendance requirement by announcing a more specific attendance requirement for a particular course. It is expected that a professor who imposes a more specific attendance policy will do so in writing, setting out the policy and sanctions for its violation, but this is not an absolute requirement.

Students who need to record a class due to a special circumstance, such as a medical condition, disability or family emergency, must notify the program director and obtain specific permission from either the professor or the program Director. If permission is granted, the student must arrange for the recording; Yeshiva University is not able to provide recording service for this purpose.

## **Disciplinary probation and dismissal**

Yeshiva University expects its students to exhibit high qualities of character as well as academic ability. Every student is expected to adhere to the ideals represented by the University and to the seriousness of purpose, intellectual dedication, and respect for the views and convictions of theirs. A student's continued presence on the rolls of the University; the receipt of academic credits, honors, and awards; and the conferring of any degree, diploma, or certificate upon the student are entirely subject to the disciplinary powers of the University and are predicated on the student maintaining high standards of ethical and academic conduct. A student may be placed on probation or dismissed by the University at any time for infringement of these standards.

## **Accident and Health Insurance**

Full-time students are eligible to subscribe to an accident and health insurance program for themselves and their dependents. Information is made available to students at the beginning of each school year.

## **Waivers**

All exemptions and exceptions from MQE program regulations and requirements must be approved in writing by the respective program Director. Requests should be sent electronically to [mqeinfo@yu.edu](mailto:mqeinfo@yu.edu). The program Director, in consort with other senior faculty members will review the request and inform the Office of the Registrar if the waiver is approved. A student should retain a copy of all approvals for his or her records.

## **Advisement**

Each newly admitted student should refer to the program assistant for programmatic and administrative issues. The program Director may assign faculty to act as academic advisors to students, assisting them with their choice of a cursus of study within the program, and the selection of an internship or the supervision of a research essay.

## **Course Examinations**

Each course must have at least one written in-class examination. Otherwise, course examinations (number and type) are at the discretion of the instructor.

## **Special Procedures**

### **Grievance Policy**

Yeshiva University's Masters of Science in Quantitative Economics is committed to a policy of resolving all student grievances through a formal set of procedures designed to ensure that the student's issue or concern is resolved fairly.

## **Grievance Procedure**

Step 1. Student should discuss their issue or concern with the concerned faculty.

Step 2. If the student thinks that their issue or concern is still unresolved by the faculty, the student should inform the faculty in writing and discuss their issue or concern with their program Director.

Step 3. If the student is not satisfied with the solution put forward by the program Director, then the student should inform the program Director in writing. The program Director must form and discuss the issue with a subcommittee of his or her program's faculty.

Step 4. If the student thinks that their issue or concern is still unresolved by the program subcommittee, they should inform the program Director in writing and discuss their issue or concern with the Provost.

As the grievance procedure is also designed to sustain an atmosphere of mutual respect between faculty and students, it is integral part of the standards of ethical and professional conduct. Failure on the part of the student to follow this grievance procedure may then result in disciplinary probation or dismissal of the student from the program.

## **Procedures Regarding Complaints of Unlawful Harassment**

The Masters of Science in Quantitative Economics follows the standard university procedures for such complaints.

## **Accommodations for Students with Learning Disabilities**

If you would like to request educational accommodations for a disability that affects your academic performance you must provide documentation for this need. Documentation must include information regarding:

- a) the nature of the disability;
- b) the specific types of accommodations being requested;
- b) accommodations previously provided (if any).

If you have received accommodations in the past (e.g. college) for a disability affecting your academic performance and feel that you continue to require these accommodations, documentation may be in the form of a letter from a college official responsible for approving accommodations.

If you did not receive accommodations in the past, please provide a recent report (less than 3 years old) from a licensed psychologist that includes evidence from tests of cognitive

functioning, academic functioning and neuropsychological functioning and documents the need for accommodations.

If your request for accommodations is approved by the program Director, a memo will be issued to the appropriate faculty requesting that you be provided with accommodations. You should work with the appropriate faculty to coordinate the accommodations.

Please contact the Provost's Office for additional support and guidance.

You may also visit [LDonline.com](http://LDonline.com) for further information about Learning Disabilities.

## Courses

It is expected that graduates of the program will acquire a deep knowledge of modern economics.

### First Period (August–December; 12 credits)

Math for Economists	R. Shao
Macro I	W. Hawkins
Micro I	staff
Mathematical Statistics	staff

### Mathematics for Economists (13 weeks)

Principles of real analysis (topology in Euclidean spaces), continuity, differentiability. Basic concepts in convex analysis. Linear and nonlinear programming. Inverse function and implicit function theorems. Riemann integration. Dynamic programming. Introduction to linear algebra, eigenvalues, diagonalization and applications to difference equations.

*References:* W. Rudin Principles of real analysis; S. Lang Introductory Linear Algebra; D. Luenberger Optimization by Vector Space Methods; K. Border Fixed Points.

### Microeconomics I (13 weeks)

Choice, preferences, utilities. Demand theory. Production theory. Decision under uncertainty. Equilibrium in competitive markets. First and Second Welfare Theorems. Monopoly. Externalities and public goods. Asymmetric information: adverse selection and moral hazard. Aggregating preferences and social choice theory. Mechanism design. Cooperative games, the core, assignment games and stability.

*References:* A. Mas Colell, M. Whinston, J. Green Microeconomic Theory; A. Rubinstein Microeconomic Theory

### Macroeconomics I (13 weeks)

This course is the first of a two-semester Masters level introduction to macroeconomics. The first semester will begin with models of economic growth, including the Solow-Swann model, the Ramsey optimal growth model, models with overlapping generations, and models with endogenous or stochastic growth. This section will also include an examination of the

empirical growth literature. The next part of the course will introduce the Real Business Cycle Model, with various extensions and a critical evaluation of its empirical performance. From this will come an examination of models of consumption decisions, including various frictions such as liquidity constraints and imperfect risk-sharing.

References:

Romer, D., *Advanced Macroeconomics*, 4<sup>th</sup> Ed., McGraw-Hill/Irwin, 2011.

Deaton, A., *Understanding Consumption*, Oxford Univ. Press, 1993.

### **Mathematical Statistics (13 weeks)**

Basic calculus of probability, and elementary concepts. Measures, events, measurability. Independence, Borel-Cantelli Lemmas. Lebesgue integral and expectation, variance, covariance. Conditional expectation, regression analysis. Colinearity, heteroschedasticity. Stochastic processes, Markov processes. Martingales, stopping times, convergence. Convergence of stochastic processes: weak, strong, in distribution. Strong law of large numbers. Moment generating functions and central limit theorems.

*References:* D. Williams Probability with Martingales.

**Real Variables** is an elective offered by the Mathematics Dept, and is a strongly recommended elective.

### **Second Period (January–May; 12 credits)**

Names of instructors are tentative.

Econometrics	staff
Macro II	O. Acigkoz
Micro II	G. Bloise
2 Electives	(see list below)

The elective can be chosen from a list of courses such as:

Quantitative Macroeconomics (O. Acigkoz)

Financial Economics (A. Citanna)

Market Design (T. Hashimoto)

More courses than the minimum required can be taken. Required courses can also be waived, and students can then select multiple electives.

### **Third Period (May–August; 6 credits)**

Independent study and an essay that can take the form of a report about a three-to-four month research internship in a research laboratory or equivalent institution, or of a research paper, under the supervision of a faculty member.

#### **ACADEMIC CALENDAR, FALL 2015**

Registration Begins: Aug 26, 2015

Registration Cutoff Date: Sept 15, 2015

First day of Monday/Wednesday classes: Monday, Aug 31

First day of Tuesday/Thursday classes: Tuesday, Sept 1

Classes will be held on all days, Monday through Thursday, unless indicated otherwise.

Labor Day holiday (no class)	Monday, Sept 7
Rosh Hashanah holiday (no classes)	Monday, Sept 14 and Tuesday, Sept 15
Yom Kippur holiday (no classes)	Tuesday, Sept 22 and Wednesday, Sept 23
Sukkoth Holiday (no classes)	Monday, Sept 28 and Tuesday, Sept 29
Shmini Atzeret/Simcha Torah (no classes)	Monday, Oct 5 and Tuesday, Oct 6
Thanksgiving holiday (no classes)	Thursday, Nov 26 and Friday, Nov 27
Friday classes	Sept 11 and Oct 9
Last day of regularly scheduled classes	Thursday, Dec. 10
Final Exams	Tuesday, Dec 15, 2015 – Friday, Dec 18, 2015

#### **ACADEMIC CALENDAR, SPRING 2016**

The MQE Spring 2016 calendar will follow the general undergraduate calendar, with few exceptions communicated to students at the beginning of the semester.