

# Graduate Studies at

# UNION

2001-2002 Bulletin

Graduate Studies Bulletin 2000-2001

**Small College Community,  
Big-World Ideas**

Union College  
Schenectady, New York

# Contents

---

General Information . . . . .	3
Registration Procedures . . . . .	4
Graduate Information . . . . .	5
Academic Information . . . . .	6
Financial Information . . . . .	8
College Facilities and Services . . . . .	11
Center for Bioethics and Clinical Leadership . . . . .	13
Educational Studies Programs . . . . .	17
Engineering and Computer Science . . . . .	23
Graduate Management Institute . . . . .	30
Administration and Faculty . . . . .	41

## **IMMUNIZATION**

All students attending New York State colleges and universities, whose birthdates are on or after January 1, 1957, are required to show proof of immunity against measles, mumps, and rubella.

Proof of immunization must be submitted to the Health Services Office **prior to registration**. A form is available for this purpose. Students may also provide a physician’s written statement as proof of immunization but such documentation must provide all required information and be attached to our form. The Health Services Office will provide the student with a “Health Clearance” form indicating compliance with the law. This form must be presented in order to register.

Students whose religious beliefs prohibit immunization, or for whom these immunizations would be detrimental to their health, will be required to submit documentation in support of their request for a waiver. Questions concerning immunization requirements should be directed to the Health Services Office at 518-388-6120.

# Graduate Studies at UNION

## **ABOUT UNION COLLEGE**

Chartered in 1795, Union is an independent college for men and women of high academic promise and strong personal motivation. The College has strong commitments to certain fundamental assumptions about education—about its matter and its methods, but above all about its goals.

The College believes that every student should learn to gather and evaluate information, to think coherently, to write succinctly, and to form aesthetic judgments. The College hopes that in acquiring these tools students will also discover a taste for the life of the mind, a respect for intellect, and a sense of the range of human possibilities - qualities that will enable them to construct their own lives and thoughts on a rational design.

In the end, the success of the Union College program is measured less by what the College has done to its students than by what these students have done with the opportunities the College provides.

## **GRADUATE STUDIES**

Union's Lamont Graduate Center Office develops and administers a variety of programs, including undergraduate and graduate degree programs for both full-time and part-time students and the College summer school.

For almost half a century, both undergraduate and graduate courses have been available in the late afternoon and evening.

Master's degrees are available in engineering, computer science, business, health management, and educational studies. The master's degree in business is available in a variety of concentrations. In addition, students may earn a joint J.D./M.B.A. degree through a cooperative program with Albany Law School. A combined PharmD/M.S. is offered in conjunction with the Albany College of Pharmacy.

## **ABOUT THIS CATALOG**

The information in this catalog was prepared as of May 15, 2001. Provisions of this publication are not to be regarded as an irrevocable contract between the student and Union College. The College reserves the right to make changes in its course offerings, degree requirements, regulations and procedures, and fees and expenses, as educational and financial considerations require.

Union College does not discriminate on the basis of age, sex, race, color, religious belief, disability, sexual orientation, or national origin. The College's policy of nondiscrimination extends to all areas of college operations, including but not limited to admissions, student aid, athletics, employment, and educational programs.

# General Information

## CALENDAR

The Lamont Graduate Center Office processes registrations for all courses offered in this catalog.

### Regular Office Hours:

Monday - Friday . . . . . 9:00 a.m. - 4:00 p.m.

### Fall Term 2001

Registration: (*Late registration fee charged after August 24*)  
 August 13 - 24 . . . . . 9:00 a.m. - 4:00 p.m.

Open House with Evening Advising:  
 August 15 . . . . . 4:30 p.m. - 6:30 p.m.

Special Office Hours:  
 August 23 . . . . . 9:00 a.m. - 6:00 p.m.  
 September 4 . . . . . 9:00 a.m. - 6:30 p.m.

Classes Begin . . . . . September 3  
 Classes End . . . . . November 9  
 Exam Period . . . . . November 12 - 16

### Winter Term 2002

Registration: (*Late registration fee charged after November 16*)  
 November 5 - 16 . . . . . 9:00 a.m. - 4:30 p.m.

Evening Advising:  
 November 7 . . . . . 4:30 p.m. - 6:30 p.m.

Special Office Hours:  
 November 15 . . . . . 9:00 a.m. - 6:30 p.m.  
 OFFICE CLOSED . . . . . December 24 - January 1  
 January 3 . . . . . 9:00 a.m. - 6:30 p.m.  
 January 7 . . . . . 9:00 a.m. - 6:30 p.m.

Classes Begin . . . . . January 7  
 Classes End . . . . . March 15  
 Exam Period . . . . . March 18 - 22

### Spring Term 2002

Registration: (*Late registration fee charged after March 15*)  
 March 4 - 15 . . . . . 9:00 a.m. - 4:30 p.m.

Evening Advising:  
 March 6 . . . . . 4:30 p.m. - 6:30 p.m.

Special Office Hours:  
 March 14 . . . . . 9:00 a.m. - 6:30 p.m.  
 April 1 . . . . . 9:00 a.m. - 6:30 p.m.

Classes Begin . . . . . April 1  
 Classes End . . . . . June 7  
 Exam Period . . . . . June 10 - 13

**Commencement: . . . . . Sunday, June 16, 2002**

**Snow Closing:** Snow closing announcements will be broadcast on the following stations: WGY (810 AM), WYJB (95.5), WQBK (104), WPYX (106), WKLI (101), WFLY (92), WRVE (99.5) and WTRY (98) after 2:00 p.m.

**Religious Observances:** Classes will be held; students observing holidays may request make-up sessions for exams.

## PROGRAMS AND ADVISORS

### Lamont Graduate Center Office

(518) 388-6288 FAX: (518) 388-6686

### Graduate Management Institute

(518) 388-6238 FAX: (518) 388-6754

### Educational Studies

(518) 388-6361 FAX: (518) 388-6686

M.S.	Telephone	Professor
• Bioethics	388-8045	R. Baker
• Clinical Leadership in Health Management	388-8045	R. Baker
• Computer Science	388-6319	D. Hemmendinger
• Engineering:		
Electrical	388-6272	E. Hassib
Mechanical	388-6322	F. Milillo

### Educational Studies

• Master of Arts in Teaching	388-6361 388-6361	P. Allen B. Hall
• Master of Science for Teachers	388-6361 388-6361	P. Allen B. Hall

### M.B.A.

• Master of Business Administration	388-6297	R.A. Bowman
• Health Systems Administration	388-6299	M. Strosberg

### Combined Degree Programs

• J.D./M.B.A.	388-6302	D. Arnold
• J.D./M.B.A. Health	388-6782	V. Manna
• Accelerated B.A. or B.S./M.B.A.	388-6236 388-6598	T. Ashman P. Neidermeyer
• MS in Clinical Leadership in Health Management and Pharmacy Doctorate	388-8045	R. Baker

## Registration Procedures

### WHEN TO REGISTER

Students may register in person, by mail or fax prior to each term. Program advisors are available during the special evening advising held prior to each term and by appointment at other times. Registrations will be accepted through the last day of each registration period. A non-refundable late registration fee of \$50 will be assessed to all registrations received after the last day to register without a late fee (specific dates are listed in the catalog for each term) and the first day of class. This is in addition to the required \$100 non-refundable deposit. A non-refundable late registration fee of \$150 will be assessed to all registrations received within seven days of the first class meeting. This is in addition to the required \$100 non-refundable deposit. A non-refundable late registration fee of \$300 will be assessed to all registrations received between seven and fourteen days of the first class meeting. This is in addition to the required \$100 non-refundable deposit.

### HOW TO REGISTER

1. All registration materials are available from the Lamont Graduate Center Office. Prospective students may pick up the materials in person Monday through Friday, 9:00 a.m. - 4:00 p.m., or may request that they be mailed to them. Materials are automatically mailed to currently enrolled students prior to the registration period.
2. **All students must submit an application and proof of immunization before registering for courses.** Applications for all graduate programs are to be submitted to the Lamont Graduate Center Office. Proof of immunization must be submitted to the Health Services Office, Silliman Hall.
3. Complete the registration form, including the appropriate faculty advisor's signature, and return it either in person or by mail to the Lamont Graduate Center Office. A "Health Clearance" form must be presented along with the registration form. A deposit of \$100 must accompany your registration. You may pay with a check or by MasterCard/Visa.
4. Full payment—either by check or charge card—is due by the first day of classes.
5. All students should check with the Lamont Graduate Center Office prior to registration for additions to or deletions from the course listings or changes in class times or locations.
6. Some courses have enrollment restrictions. It is the student's responsibility to register early to reserve a space in such courses.
7. The College retains the right to cancel a course if the enrollment is insufficient.

### ENROLLMENT IN DAY COURSES

Matriculated students pursuing course work in the evening may complete requirements for a degree by taking selected day courses not offered during a given year in the evening.

Students who wish to enroll in day courses must consult with the Lamont Graduate Center Office and their academic advisor. Many day program courses have restricted enrollments. In cases where day course enrollment is limited, it is necessary to obtain a permission card from the academic department offering the course during the eighth week of the preceding term. Please consult the Registrar's office in Whitaker House, 388-6109, for the exact dates.

### AUDITING OF COURSES

Students may audit courses for one-half the tuition charged for a credit course. **Auditors must have appropriate course prerequisites and obtain written permission from the instructor.** Laboratory courses and independent studies are not open to auditors. Audit status is indicated by a "Z" on the student's transcript and is not calculated in the student's cumulative average.

Students who wish to change from credit to audit may do so by notifying the Lamont Graduate Center Office in writing by the end of the sixth week of classes. No tuition refunds are available for changes from credit to audit.

### CROSS-REGISTRATION

As a member of the Hudson-Mohawk Association of Colleges and Universities, Union participates in a cross-registration agreement which enables full-time matriculated graduate students to take courses at other member colleges and receive credit at Union. At least one-half of a student's term load must be taken at Union. Registration for each course must be approved by the student's advisor and the host institution. Generally, cross registrations will be approved only for courses not offered at the home institution. Cross-registration forms with detailed instructions are available from the Lamont Graduate Center Office.

# Graduate Information

## Course Registration/Matriculation Procedures

### STEP I:

Before registering for their first course, all students, degree or non-degree, must fill out a one-page application and submit a \$50 application fee. All applications and fees are received by the Lamont Graduate Center Office. Graduate Management Institute students must submit an unofficial copy of their transcript.

**No student will be permitted to register for a first course unless an application/fee has been submitted.**

### STEP II:

Before registering for a fourth graduate course, the final decision on the student's application must be made.

**No student will be permitted to register for a fourth course unless already matriculated.**

### NON-DEGREE STUDENTS:

Students who are not planning to work towards a degree must follow Step I only.

### GENERAL REQUIREMENTS FOR ADMISSION

Evidence of intellectual achievement, motivation and aptitude are required for admission to graduate programs. All students must have an undergraduate degree from an accredited college before applying for graduate degree status. A grade average of B (3.0 cumulative index) or better in undergraduate work is expected for admission. Students who wish to apply for degree status must consult with the Lamont Graduate Center Office and make an appointment to discuss their academic program with the appropriate Program Advisor. Applicants to programs offered by the Graduate Management Institute are required to take the Graduate Management Admission Test (GMAT) as part of the admissions process. **Once submitted, all application materials become the property of Union College and are not returnable.**

### WHEN TO APPLY

Applications for admission to graduate programs are processed on a rolling admissions basis. The student may therefore apply for admission to graduate degree status at any time of the year, except in the full-time programs administered by the Graduate Management Institute and the M.A.T. program, which begins in the summer. Please refer to the sections describing these programs for specific deadlines.

## ADMISSION FOR INTERNATIONAL STUDENTS

All international students requiring an I-20 or IAP-66 form are encouraged to submit their applications by March 1. Applicants must apply for full-time study, provide proof of financial responsibility, and submit an official score from the Test of English as a Foreign Language (TOEFL). Applicants for graduate programs in Engineering and Computer Science must submit a TOEFL score of at least 550. Graduate Management Institute students must submit an official GMAT score. Candidates for all other graduate programs must submit a GRE score of at least 1650.

## TRANSFER CREDIT

With the approval of the program advisor, graduate work completed on a satisfactory level (minimum grade of B-) at other institutions may be counted toward a Union degree if it contributes to the completion of Union requirements. In programs of the Graduate Management Institute, a maximum of eight full courses may be transferred. Engineering, Computer Science and M.A.T. programs may allow one or two transfer courses.

Matriculated students interested in receiving credit for courses taken elsewhere are advised to obtain a permission form at the Lamont Graduate Center Office and acquire the necessary approval prior to registration at another school.

## COMBINED UNDERGRADUATE AND MASTER'S DEGREE PROGRAMS

Union undergraduate students with excellent academic records may apply for a combined degree program leading to a Bachelor of Science in a science or engineering field and a Master of Science in engineering or computer science; a Bachelor of Arts or Bachelor of Science and a Master of Business Administration in management, health systems administration, or a Bachelor of Arts or Bachelor of Science and a Master of Arts in Teaching. A cumulative average of at least 3.2 in undergraduate courses is expected. Acceptance into the program enables students to apply up to three graduate level courses for credit (depending on the major) in fulfillment of both undergraduate and graduate degree requirements. Students must apply for graduate admission no later than the end of their 10th term of undergraduate work. At the time of application the student must submit a complete program of study which has been approved by the academic advisor from the appropriate department. Students applying to the Graduate Management Institute with 3.4 grade point average are not required to take GMATs.

## ACADEMIC STANDING

The maintenance of graduate status requires a B (3.0) grade average. Matriculated students whose grades fall below the required 3.0 cumulative index are put on academic probation and will be notified in writing. If permitted to continue, the student must raise his or her grade average to B. Failure to do so will lead to the termination of graduate status.

A grade of F in one course or a grade of C in two graduate level Engineering, Computer Science, or Educational Studies courses or three Graduate Management Institute courses may indicate that the student is not of graduate caliber. Matriculated students will be dropped from the program. A grade of B- is considered to be substandard performance for a graduate level course.

## SUBCOUNCIL ON GRADUATE STUDIES

The Subcouncil on Graduate Studies of the Academic Affairs Council is responsible for recommending graduate policy for the admission and academic performance of students. The Subcouncil consists of faculty representatives, student representatives, the Dean of Arts and Sciences, and the Dean of Engineering. The Subcouncil approves students accepted to degree status and reviews petitions submitted by students with academic considerations. Students who wish to petition the Subcouncil with regard to grades, graduate status, or other matters must do so in writing.

## Graduation Requirements

A student who intends to graduate in June must send a letter of intent to the Lamont Graduate Center Office by December 1 of the preceding year. This obligation rests with the student.

## GENERAL REQUIREMENTS

A minimum of one academic year of course and thesis work is required for the master's degree in most programs. This is equivalent to 9 or 10 full courses or 7 or 8 full courses plus 2 thesis courses. **Students must finish their degree requirements within six years of matriculating at Union.**

The M.S. and M.B.A. degrees offered by the Graduate Management Institute require considerably more course work (see *Graduate Management Institute* section of this catalog).

For some degrees, candidates must pass an oral and/or written comprehensive examination given by a committee selected by their major department. The committee will be composed of three faculty members and, usually, one member from outside the college faculty. The oral or written

examination will relate to the student's course work and thesis research. A student who fails the examination may be given one more opportunity for examination upon recommendation of the Examining Committee. The reexamination must take place during the following year.

## Academic Information

### ACCREDITATION

Union College is fully accredited by the Middle States Association of Colleges and Secondary Schools and the American Chemical Society. The civil, computer systems, electrical, and mechanical engineering programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). The Health Systems Administration program is accredited by the Accrediting Commission on Education for Health Services Administration (ACEHSA). Union's MBA program is accredited by AACSB-International, the world's leading business school accrediting body. Union's program is unique in being the smallest of all AACSB-accredited business programs and one of only 28 accredited programs—along with such institutions as Harvard University, Stanford University, and Dartmouth College—that focus solely on graduate degrees. Less than 30 percent of all business programs are accredited nationwide.

### ADVISORY SERVICE

Questions regarding admission to graduate programs should be directed to the Lamont Graduate Center Office. Faculty members are available by appointment and during special advisement evenings preceding each term. All students must consult with an academic advisor before enrolling in courses. Engineering students in particular need to be advised of changing requirements.

## Grading Policies and Procedures

### COURSE NUMBERING SYSTEM

Union College uses a course numbering system with four levels. Courses numbered 010-099 are those for which only undergraduate credit is given. Courses numbered 100-199 may be taken for upper-level undergraduate or for graduate credit, although some programs may limit the number of 100-level courses that may be taken for graduate credit. Courses numbered 200-399 are graduate courses.

Academic credit is computed using a system, which counts the number of course units completed. Most courses are for full credit (1 course unit), which is equivalent to 3.3 semester credit hours or 5 quarter hours. All courses listed in this catalog are full credit courses unless designated otherwise.

## GRADING

Grades are awarded according to the following system:

A 4.0	B+ 3.3	C 2.0
A- 3.7	B 3.0	F 0.0
	B- 2.7	

A student who receives a grade of "F" may request approval to repeat the course. Both the "F" and the new grade appear on the transcript and are included in the cumulative index.

## INCOMPLETE COURSE WORK

Students must complete the appropriate form to be filed with the Registrar. When an "Incomplete" is granted, the incomplete grade may not extend beyond one term.

All grade changes must be received in writing from the professor responsible for the student's work and co-signed by the chair or the director of that department.

Final grades are mailed to students. No grade reports are given by telephone.

## WITHDRAWALS

To withdraw from a course, a student must notify the Lamont Graduate Center Office *in writing*. Withdrawals *prior* to the first class meeting will receive a full tuition refund, less the \$100 deposit.

Students may withdraw from a course up until the end of the sixth week of classes.

*Withdrawal after* the sixth week will appear as an "F." **Any student who stops attending a course without written notification to the Lamont Graduate Center Office will also receive an "F."**

**Please note:** Students will not be permitted to withdraw if there is an outstanding balance on their bill.

## TRANSCRIPTS

Official transcripts from Union College must be requested in writing. They cannot be sent to students but will be mailed to other educational institutions, employers, prospective employers, etc. This insures the privacy of the student's academic records. Unofficial transcripts, without the college seal, are available for the student's personal records. A fee of \$3.00 must be paid for each transcript.

## RIGHTS AND PRIVACY ACT

Students have access to all personal records. The Registrar's files are maintained at the Lamont Graduate Center Office. Advisors' files are maintained by each advisor. Students may inspect their files on request. Any unsuccessful attempt should be reported to the Chair of the Graduate Subcouncil.

Access to student files is denied to outside persons unless the student gives written permission. Exceptions are directory information (name, major, telephone number, degree and date awarded, academic honors, and attendance dates), release of information required by government statute to government representatives, and release of information required by court order.

All recommendations are destroyed as soon as the specific use for which they were intended is complete.

## STUDENT CONDUCT AND ACADEMIC HONESTY

Your first responsibility as a student is academic honesty. The College assumes that students will not resort to plagiarism, theft and mutilation of library books and periodicals, or any other form of academic dishonesty. Any student found guilty of academic dishonesty will be subject to appropriate disciplinary action. Additional information is found in the booklets *Plagiarism: A Cautionary Word to Students* and the *Student Handbook*, which are available at the Lamont Graduate Center Office.

All members of the College community are bound together by respect for the individual and the collective rights of others. Any student who violates the safety and security of the College community is subject to disciplinary action by the College as outlined in the Code of Student Conduct. Any member of the College community or a guest/visitor may initiate charges of misconduct against a student currently enrolled at the College.

Allegations of misconduct against a student enrolled in graduate programs must be submitted in writing to the Dean of Arts and Sciences. Responsibility for adjudicating violations and imposing disciplinary actions rests with the Dean of Arts and Sciences according to the procedures stated in the Student Conduct Code.

Union College has always had a central concern for establishing and maintaining a community in which work and learning proceed in a humane and caring atmosphere for all its members. Sexual harassment is a violation of law and will not be tolerated in any form at Union College.

Sexual harassment, according to the definition developed by N.O.W., is any repeated or unwanted verbal or physical sexual advance, sexually explicit derogatory statements or sexually discriminatory remarks made by someone in the classroom or workplace which is offensive or which causes the recipient discomfort or humiliation or which interferes with the recipient's education or job performance.

Should students feel they have been the victims of any form of the behavior noted above, they may initiate informal discussion or more formal procedures through any of the following administrators: Dean of Engineering; Dean of Arts & Sciences; Director of Affirmative Action. A sexual harassment brochure outlines appropriate actions students may take. It is periodically distributed to new students.

*Union College's policy of nondiscrimination on the basis of age, sex, race, religion, disability, sexual orientation or national origin extends to all areas of college operations including, but not limited to, admissions, student aid, athletics, employment and educational programs.*

## Financial Information

### Tuition and Fees

Full tuition payments are due at the Lamont Graduate Center Office before the first class meeting. Students who pay after the first class meeting will be charged a late payment fee. Tuition for graduate courses is listed below with an accompanying schedule of fees for withdrawal from courses. No refund of tuition will be given more than fourteen days after the first class meeting.

#### FEES FOR WITHDRAWAL FROM COURSES

Type of Course	Tuition	Within 7 Days of 1st Class Meeting	Within 14 Days of 1st Class Meeting
Graduate Engineering	\$1928	\$150	\$300
Graduate Management Institute	\$1625	\$150	\$300
Educational Studies	\$1308	\$150	\$300

#### SENIOR CITIZENS

Persons over 65 are eligible for a tuition waiver for one credit course per year on a space-available basis, and with the permission of the instructor.

#### FEES (Other than Course Withdrawal)

##### Registration Deposit . . . . . \$100 (non-refundable)

All registrations must be accompanied by a registration deposit that is applicable to tuition. The deposit must be paid before a registration will be processed. The fee is non-refundable unless the College must cancel all courses for which a student has registered.

##### Late Registration . . . . . \$50 (non-refundable) (Before Classes Begin)

Charged to students registering after the last day of the registration period listed in the calendar for each term.

##### Late Registration . . . . . \$150 (non-refundable) (Within 7 Days of the First Class)

Charged to students registering WITHIN seven days of the first class meeting.

**Late Registration . . . . . \$300 (non-refundable)  
(Between 7 and 14 Days of the First Class)**

Charged to students registering between seven and fourteen days of the first class meeting.

**Late Tuition Payment . . . . . \$50 (non-refundable)**

**Tuition Deposit . . . . . \$100 (non-refundable)  
(GMI students only)**

After being admitted to GMI, all first-year full-time GMI students must submit a \$100 tuition deposit to reserve a place in the entering class. This deposit is applied to tuition and is not refundable should the student ultimately decide not to matriculate at Union.

**FEE FOR CHECKS RETURNED TO THE COLLEGE**

- First Check . . . . . \$10**
- Second Check . . . . . \$15**

**Proficiency Examinations . . . . . \$250**

Proficiency examinations for course credit are provided to students with previous experience or study. Applications should be made with the department chair. Registration and fee payment must be made at the Lamont Graduate Center Office prior to taking the examination.

**Application for Degree Status . . . . . \$50**

**Status Continuation . . . . . \$100**

Graduate students who are degree candidates and are working on their thesis must pay a continuation fee for any term in which they are not formally enrolled in one of the required research and thesis courses. Summer term not applicable.

**Student Resource Fee . . \$150 (GMI students only)**

All full-time GMI students must pay an annual student resource fee that is used to support student-organized events, and expenses related to operation of the graduate student computer lab. Part-time students pay this fee only once, at matriculation.

**OTHER FEES**

- Master's Thesis . . . . . \$15**
- Diploma Fee . . . . . \$30**
- Transcripts (Official) . . . . . \$3**
- (Unofficial) . . . . . \$3**
- Parking Decal . . . . . \$15**

**GENERAL FINANCIAL OBLIGATIONS**

Diploma and transcripts will be withheld from a student who has not met all financial obligations to the College. Failure to satisfy all financial obligations will result in the account being sent to an agency for collection; the student will be responsible for all collection and/or legal fees that are assessed.

**TUITION WAIVER POLICY**

Students with waivers must pay all fees other than course tuition.

**MASTERCARD AND VISA**

Tuition and fees may be charged on MasterCard and/or VISA accounts. The authorization section of the registration form must be completed.

**COMPANY BILLING**

Some companies and government agencies pay their employees' tuition directly to the College. If your tuition will be paid in this manner, please supply authorizing forms or letters from your employer. **If your employer intends to pay 100 percent of your tuition at the start of the term, your registration deposit will be waived.**

**COMPANY REIMBURSEMENT**

Some companies and government agencies pay their employees' tuition once grades are received. If your tuition will be paid in this manner, you will be responsible to pay tuition in full the first term you register. For subsequent, consecutive terms, providing the same number of classes are taken, you may register with a deposit of \$100 with the balance to be paid when the previous term's reimbursement is received. **Please note: If payment is not received in our office by the fifth week of the current term, whether reimbursement has been received or not, a late payment fee of \$50 will be assessed.**

## Financial Aid

The Office of Financial Aid at Union College, located on the second floor of Becker Hall, is responsible for financial aid services to Graduate and Continuing Studies students. Questions concerning eligibility for state and federal programs should be directed to the Office of Financial Aid (388-6123). Students may qualify for one or more of the programs listed below

### FEDERAL SUBSIDIZED STAFFORD LOANS

Matriculated graduate students who are United States citizens or permanent residents may borrow up to \$8,500 per year, aggregate maximum of \$65,500 (including undergraduate loans).

Loans carry a variable interest rate capped at 8.25%, which is deferred until six months after completion of studies or a drop in enrollment below half time. Students have up to ten years to repay. Eligibility is determined by completing a Free Application for Federal Student Aid (FAFSA) and a loan application, and submitting federal tax returns and other supporting documentation to the Financial Aid Office. Allow twelve weeks from start of the application process to receipt of the loan check. Loans are disbursed in at least two payments.

### FEDERAL UNSUBSIDIZED STAFFORD LOANS

Matriculated graduate students are eligible for up to \$10,000 per year up to a total of \$73,000.

**NOTE:** If the loan originally covers a term in which you do not enroll at least half time, a portion of the amount received must be returned to the bank. Students who withdraw from Union College must visit the Financial Aid Office for exit information regarding their loan. Upon graduation, this information session is *required*.

### SUPPLEMENTAL LOAN PROGRAMS

Available to students attending graduate or certificate programs on a full or part-time basis. Loan approval is based on the review of credit worthiness and ability to repay the loan, not on financial need. Applications are available at the Financial Aid Office located in Becker Hall.

### TUITION ASSISTANCE PROGRAM (TAP)

Full-time matriculated graduate students who are residents of New York may apply for TAP. Eligibility is based on New York State net taxable income. Graduate students may receive up to \$550 per year. Applications are available at the Offices of Graduate and Continuing Studies and Financial Aid.

## GENERAL TUITION SCHOLARSHIP PROGRAM

The Lamont Graduate Center Office awards a small number of scholarships covering partial tuition for students in extreme financial circumstances during their last term or year, whose need is not met by the state and federal programs listed above. These scholarships may be applied only to tuition for courses listed in the Graduate and Continuing Studies catalog. Students who wish to apply for this program should complete the Financial Aid Supplement Application. This form is available at the Lamont Graduate Center Office and must be returned directly to that office. In order to be considered, students must be matriculated at Union and must have shown satisfactory academic performance in previous courses taken at Union or other approved institutions.

### LEO A. AROIAN FELLOWSHIP

The Aroian Fellowship is awarded annually to an M.B.A. student with superior achievement and a strong interest in quantitative analysis.

### VETERANS ADMINISTRATION EDUCATIONAL BENEFITS

Students who are eligible to receive educational benefits under the various chapters administered by the V.A. may obtain more information by contacting the Lamont Graduate Center Office.

Entitlement will vary depending on the education program.

Students claiming veterans benefits are required to submit written monthly statements attesting to the fact that they are attending class. The following statement must be submitted in person or by mail to the Lamont Graduate Center Office, Attn: Linda Jorgensen:

*The undersigned attests that he/she continued to regularly attend classes for those courses in which he/she is currently enrolled.*

Signed statements are due on the following dates and should be so dated:

Fall Term 2001	Winter Term 2002	Spring Term 2002
September 28	January 25	April 26
October 26	February 22	May 24
November 9	March 8	June 7

Any veteran not forwarding this statement will be decertified, resulting in the termination of benefits. Students pay tuition and fees upon registering and subsequently receive benefit checks from the V.A. on a timely basis.

## College Facilities and Services

### **ATHLETIC FACILITIES . . . . . 388-6284**

The Alumni Gymnasium offers an eight-lane swimming pool with seating and a diving area, a multi-use gym, five racquetball and three squash courts, as well as an exercise room, new locker rooms, and offices. Alumni Gym has two weight rooms, one with fifteen Cybex machines and the other with first-rate free-weight equipment. The Memorial Field House contains a one-tenth mile indoor track, two basketball courts, and a multi-station universal gym.

The all-weather, artificial turf field is the main outdoor facility for a very active intramural program.

### **CAMPUS SAFETY . . . . . 388-6358**

The Campus Safety Department is located in the Campus Operations Building on the north side of campus, between the Science and Engineering Building and the Field House. The Department provides a 24-hour, 7-day-per-week Operations Control Center and preventive patrol. The Control Center monitors fire alarms and receives emergency calls and requests for service (6911). During business hours, the Department handles vehicle registrations, lost and found, and parking tickets.

Emergency telephones are strategically placed around the campus. "Hotline" phones are activated simply by removing the handset from the cradle. Outdoor emergency phones housed in red telephone boxes can be found at the following locations: 27 North Terrace Lane; the southeast corner of the Arts Building; the East Side of Achilles Rink near Whipple Bridge; the East Side of Bailey Hall; at the corner of South College (South Terrace Lane and South Lane); the northeast corner of Davidson; the southwest corner of Humanities; the northeast corner of Social Science; and behind 17 South Lane. "Interior Hotline" and courtesy phones are located in most campus buildings.

A student operated escort service is available between 8:00 p.m. and 1:00 a.m. This service is to provide personal security and is not intended to be a shuttle service. Please contact Campus Safety for further information.

### **CAREER DEVELOPMENT CENTER . . . . . 388-6176**

The Career Development Center, located in Old Chapel, third floor, offers a variety of services for matriculated graduate students.

Persons who are interested in exploring career options may request individual appointments with a career counselor and/or use the career information materials in the Career Development Center library. Students may also sign up for group workshops designed to help with the career planning process, resume writing and interviewing skills. The Center is open Monday through Friday from 8:30 a.m. to 5:00 p.m. and certain evenings. Call the Center for evening hours.

On-campus recruiting sign-ups begin in September for the fall term and in January for the winter term. Interested students should contact the Career Development Center at the beginning of fall term to get additional information. The dates and times for group workshops and on-campus recruiting are printed in the monthly newsletter published by the Career Development Center. The newsletter is available at both the Center and the Lamont Graduate Center Office.

### **COMPUTER FACILITIES . . . . . 388-6293**

The Peschel Computer Center in Steinmetz Hall houses the College's shared central computers and servers (running NT and Unix), public personal computer labs and related facilities. Students who wish to use the central computers must have a computer account, which they may obtain by completing an Application for Computer Access (AFCA). The forms are available at the Computer Center. Public access personal computers (IBM and Apple Macintosh) are available in three computer labs 24 hours a day in labs in Steinmetz Hall. Scanners and printers are also available in these labs.

The College is connected to the Internet, which may be accessed via the central computers or personal computers in labs.

Graduate and Continuing Studies students with central computer accounts may take advantage of 33.6 Kbps dial-in lines (12 lines). The phone number is 388-6836.

**DINING FACILITIES . . . . . 388-6050**

Dutch Hollow, located in the Reamer Campus Center, features fast food and much more. Beverages, pizza, ice cream, submarine sandwiches, and “broiled to order” items are readily available before and after evening classes, from 7:30 a.m. to 12:00 a.m. Specials are served from 11:30 a.m. to 2:00 p.m., and 5:00 to 7:30 p.m., Monday through Friday. Another popular spot is the Rathskellar, opened by students in the 1950s and located in the basement of Old Chapel.

**HEALTH AND ACCIDENT INSURANCE . . . . 388-6642**

Full-time students may purchase a health and accident insurance policy at affordable cost through the College.

**LIBRARY . . . . . 388-6277**

The newly renovated Schaffer Library houses over 515,000 volumes and 1500+ current periodical subscriptions. It is a government depository library and also has substantial microform collections. Special Collections houses the College archives and collections of rare books and manuscripts. Several online services provide access to additional bibliographic databases and full text sources.

The building, which was completed in the fall of 1998, contains group study rooms, a fully wired classroom, faculty study spaces and general seating areas. It operates on an open stack plan and offers interlibrary loan, mediated online searches and document delivery services. Students in good standing are permitted to borrow materials from the library once they are registered with the library. Students may also obtain a direct access card through the circulation department which permits direct borrowing from many libraries in the area.

The library’s web page (<http://www.union.edu/PUBLIC/LIBRARY>) describes much more about the library’s services, policies and collections.

**PARKING . . . . . 388-6178**

Parking on the College campus is restricted. Students who wish to park on campus must purchase a decal for \$15 and park in designated areas. There is absolutely no parking on any campus roadways as they are fire lanes. Decals, parking regulations, and campus maps may be obtained from the Campus Safety Office.

Cars parked on campus without decals will be ticketed and may be towed at their owner’s expense. All roadways are considered fire lanes. A vehicle parked in a fire lane, creating a hazard, blocking access to others, blocking dumpsters or loading zones or parked in an improper designated lot, will be subject to a \$25 fine and towing.

**REAMER CAMPUS CENTER . . . . . 388-6118**

The Reamer Campus Center with its multi-story atrium serves as the crossroads for the campus. The atrium is framed by the Auditorium, the Dutch Hollow Restaurant and Upperclass Dining Hall, Chet’s Pub, the College Bookstore, the Convenience Store, the student mailroom, and exterior terraces overlooking Jackson’s Garden.

The Center also offers meeting facilities, music rehearsal rooms, games, commuter student lockers, and the offices of the Dean of Students, Dining Services, Telecommunications, *Concordiensis* (college newspaper), *The Sentinel* (opinion), *The Garnet* (yearbook), Inner View (video club), and WRUC.

# Center for Bioethics and Clinical Leadership

**Location** . . . . . Humanities Building - Room 020  
**Telephone** . . . . . (518) 388-8045  
**Fax** . . . . . (518) 388-8046  
**E-mail** . . . . . bioethics@union.edu  
**Website** . . . . . www.bioethics.union.edu

**Director:** Robert Baker  
**Assistant to the Director:** Ann Nolte  
**Technical Support:** Lloyd Tredwell

**Professors:** Arnold, Baker, Lambrinos, Strosberg, Schmee;  
**Associate Professors:** Lehrman, Nydegger;  
**Assistant Professors:** Ashman, Neidermeyer;  
**Adjunct Professors:** Jacoby, Kaplan, Moriarity, Otto, Pratt, Shelton, Sorum, Steinbock, Thompson;  
**Visiting Lecturers:** Greenlaw, Lederer, McCullough, Veatch

## Degrees Offered:

- Master of Science in Bioethics (Joint Degree with Albany Medical College)
- Master of Science in Clinical Leadership and Health Management
- Pharmacy Doctorate and Master of Science Clinical Leadership in Health Management

## The M.S. in Bioethics

This distance and campus-based MS in Bioethics is offered jointly by the Center for Bioethics and Clinical Leadership, Union College and by the Center for Medical Ethics, Albany Medical College. It provides advanced bioethics and clinical education for doctors, healthcare administrators, lawyers, nurses, pharmacists, philosophers, researchers and students enrolled in professional and graduate degree programs. The hybrid format of short on-campus summer sessions and distance learning courses has been specially designed to meet the needs of working healthcare professionals. There are 12 required courses in the program: an intensive Summer Seminar in Health and Human Values; four required courses; three practica; a two-course thesis and two elective courses.

## APPLICATION PROCESS

The Master of Science in Bioethics will be pursued through on-campus and distance learning courses. On-campus courses are offered at Albany Medical College, Union College, and through programs in the Northeastern Bioethics Consortium.

To be considered for matriculated student status, applicants must hold a bachelor's degree and have submitted a complete application (including an essay, three letters

of recommendation, official transcripts from the institution offering the highest degree attained, the New York State immunization form, and an application fee of \$50). The Admissions committee may also require a standardized test. Applications are reviewed on a rolling basis. Applicants are notified of the committee's decision within four weeks of completed application. Tuition is assessed on a per course basis. A one-time **non-refundable** deposit of \$250 is required upon acceptance: \$100 will be credited towards tuition; the remaining portion of the deposit (\$150) is applied towards the student resource fee.

## COURSE WAIVER POLICY

Up to three courses or practica may be waived by the admissions committee. To secure a waiver, the student must complete a "Course Waiver" form and submit all applicable transcripts and other relevant documentation. A separate form must be completed for each waiver requested.

## COURSE SCHEDULE (RECOMMENDED ORDER)

**MED 246. Proseminar in Health and Human Values**  
Special Summer Session (August 5-17)

**MED 281. Health Care Policy**  
Fall, Distance Learning

**PHL 287. Biomedical Ethics**  
Winter, Distance Learning (or Spring, Evenings, Union)

**MED 202. Clinical Ethics**  
Spring, Distance Learning

**MED 205. Reproductive Ethics**  
Summer Session I, Distance Learning

**MED 301. Practicum I in Clinical Ethics**  
Summer Session II, On-site (various venues)

**MED 284. Bioethics and the Law**  
Fall, Distance Learning

**MED 206. Research Ethics-Discussions in Scientific Integrity**  
Winter, Distance Learning

**MED 207. Empirical Research Methods in Bioethics**  
Spring, Distance Learning

**MED 302. On-Line Practicum**  
Summer, Distance Learning (alternative times possible)

**MED 391. Masters Project I**  
Fall or Winter, Distance Learning

**MED 392. Masters Project II**  
Winter or Spring, Distance Learning

**MED 399. Capstone Clinical Ethics**  
Summer Session I, AMC and Union-on-campus.

## COURSES

### **MED 246. Proseminar in Health and Human Values**

*Summer (August 5-17, 2001), Day, On site: AMC & Union; Baker, Shelton, Greenlaw, Lederer, McCullough, Veatch*  
An intensive two-week introduction to current topics in clinical ethics and bioethics, taught seminar style at Albany Medical College and Union College. This overview of current issues in bioethics humanities involves four special pro-seminars, case conferences and ethics rounds. There will also be extensive training in the computer skills (demonstrations, workshops) essential to mastering distance learning. Must be in the first fifteen months of enrollment.

### **MED 281. Health Care Policy**

*Fall, Distance Learning; Strosberg*  
This course provides an understanding of the public policy-making process and the political and regulatory environment in which health care organizations function. It also provides an understanding of managerial processes, politics, and structure of the health care organizations where ethical policies and practices are implemented and carried out on an ongoing basis. Policies for consideration include resource allocation, end-of-life decision-making, accountability and performance measurement, and conflict-of-interest.

### **PHL 287. Seminar in Biomedical Ethics**

*Winter, Distance Learning, Spring (Evening), Union College; Baker*  
An advanced historically based introduction to bioethics and clinical ethics focusing on such formalizations of medical morality as the Hippocratic Oath, the AMA codes, the Belmont Report and Beauchamp and Childress Principles, and the idea of casuistry. Major cases in bioethics will also be reviewed and the evolution of the core concepts and infrastructure of medical ethics and bioethics will be examined.

### **MED 202. Clinical Ethics**

*Spring, Distance Learning; Shelton*  
This course deals with the practical applications of clinical ethics, including clinical ethics consulting and its recording and documentation, the work of ethics committees and IRBs, and other practical ethics of clinical ethics.

### **MED 205. Reproductive Ethics**

*Available 2002-2003, Distance Learning*  
An investigation of the ethical and legal problems associated with new reproductive technologies and genetics. Taught by distance learning. Elective course. (Not available until 2002-2003)

### **MED 284. Bioethics and the Law**

*Available 2002-2003*  
This course is designed to familiarize students with major legal issues and legal concepts relevant to bioethics. (Not available until 2002-2003)

### **MED 301. Clinical Practicum**

*Available 2002-2003*  
A supervised practical experience in clinical ethics designed to teach skills in clinical ethics consultation. Prerequisite: MED 202. (Not available until 2002-2003)

### **MED 302. On-Line Clinical Practicum**

*Available 2002-2003*  
A supervised practical experience in clinical ethics designed to teach skill in clinical ethics consultation. Supervision by on-site mentors and on-line faculty. Prerequisite: MED 301. (Not available until 2002-2003)

### **MED 206. Discussions in Scientific Integrity**

*Available 2002-2003*  
A course in research ethics including a discussion of the IRB process. Elective course. (Not available until 2002-2003)

### **MED 307. Research Ethics: Empirical Research Methods in Bioethics**

*Available 2002-2003*  
A course in empirical research methodology designed to teach how to conduct empirical research in the field, and how to analyze the empirical bioethics literature. Elective course. (Not available until 2002-2003)

### **MED 391 & MED 392. Master's Project**

The master's project in bioethics or clinical ethics, will involve two terms of research culminating in a written document addressing some aspect of clinical ethics or bioethical policy, such as a proposal to revise or reform practices at a medical institution or managed care organization, or a proposal to change bioethical policy. Strongly recommended: MED 207.

### **MED 399. Capstone Clinical Practicum**

Capstone practicum in which students demonstrate their mastery of clinical ethics consultation. Albany Medical Center and Union.

## **The M.S. Clinical Leadership in Health Management and 5-Year Pharmacy Doctorate and M.S. Clinical Leadership in Health Management**

### **APPLICATION PROCESS**

The Master of Science Clinical Leadership in Health Management program is a full-time, 12-month, program. Students start coursework in mid-June. This curriculum focuses on helping future physicians acquire management skills that will differentiate them in the medical school application process and, ultimately, help them succeed in the "business" of medicine. To broaden their exposure to science and build on completed undergraduate coursework, students may optionally take up to four advanced science courses offered through Union College and Albany Medical College.

To be considered for matriculated student status, applicants must hold a bachelor's degree and have submitted a complete application packet (including application essay, MCAT or Graduate Management Admissions Test [GMAT] score, three letters of recommendation, and official copies of all undergraduate and graduate transcripts) by **April 1**. Admission decisions are made by April 15 and students are notified immediately thereafter.

The Pharmacy Doctorate and Master of Science Clinical Leadership in Health Management program is limited to students from the Albany College of Pharmacy (ACP). The program is designed to give future pharmacists an understanding of the complex business environment in which they will ultimately practice. The program is typically completed on a part-time basis over three years. Students start coursework in the fall of their third year at ACP.

To be considered for matriculated student status, applicants must be enrolled at ACP and have submitted a complete application packet (including application essay, official Graduate Management Admissions Test [GMAT] score, three letters of recommendation, and official copies of all undergraduate and graduate transcripts). Applications are reviewed on a rolling basis, but students are encouraged to apply before **May 1** for the fall.

Non-U.S. applicants who have not studied for at least two years in an English-speaking program must have submitted an official score from the Test of English as a Foreign Language (TOEFL). Once submitted, all application materials become the property of Union College and are not returnable.

Tuition is assessed on a per-course basis. A **non-refundable** deposit of \$250 is required upon acceptance to full-time degree status in order to reserve a place in the entering class. A portion of the deposit (\$150) is applied toward a mandatory annual student resource fee; the remaining portion of the deposit (\$100) is credited to the student's account and applied toward future tuition charges. Part-time students pay a one-time student resource fee of \$150.

The "Registration Procedures" section of this *Bulletin* provides further information on registration procedures and deadlines.

## **REQUIREMENTS FOR THE M.S. CLINICAL LEADERSHIP IN HEALTH MANAGEMENT**

The M.S. Clinical Leadership in Health Management degree is designed for future clinicians who wish to better understand the health care industry and the environment in which it exists, or who aspire to clinically related leadership roles. There are **twelve required courses** in the program. Students in the Pharmacy Doctorate/M.S. Clinical Leadership in Health Management Program automatically waive three of these courses (MED 253, HSS 256, and STA 201). Additionally, one GMI course (GMI 210) can substitute for an ACP elective. Courses, including optional science courses for future physicians are indicated by an asterisk (\*), are listed below:

### **First Summer Term (starts Mid-June)**

GMI 210. Financial Accounting  
Gross Anatomy\* (at Albany Medical College)

### **Second Summer Term (starts Late-July)**

GMI 212. Financial Analysis and Decision Making

### **Fall Term**

MED 200. Introduction to Health Systems  
PHL 286. Biomedical Ethics  
MED 271. Clinical Leadership Practicum  
Advanced Science Course\*

### **Winter Term**

STA 201. Introduction to Probability  
MED 201. Health Systems Management  
MED 280. Health Policy and Information Systems  
HSS 256. Group Practice Management  
Advanced Science Course\*

### **Spring Term**

MED 253. Economies of Health  
HSS 217. Health Care Finance  
HSS 274. Legal Aspects of Health Care  
Advanced Science Course\*

## **COURSE WAIVER POLICY**

Students may waive up to three of the following courses without replacement based on comparable undergraduate or graduate course work (completed within the last five years, with a grade of a "B-" or better): GMI 210, GMI 212, STA 201, MED 253, or MED 200.

To secure a waiver, the student must complete the required "Course Waiver" form and submit all applicable transcripts and any other documentation requested by the professor. A separate form must be completed for each waiver requested.

## **COURSE SCHEDULE (RECOMMENDED ORDER)**

### **KEY TO TERMINOLOGY**

Time of Course Offering: D (Day)  
LA (Late Afternoon)  
E (Evening)

### **GMI 210. Financial Accounting**

*Summer Session I - E; Staff*

A study of the accounting cycle, including preparation and analysis of income statement and balance sheets, price level problems, ratio analysis, and funds flow-case flow; a critical study of generally-accepted accounting principles.

### **GMI 212. Managerial Accounting and Finance**

*Summer Session II - E; Staff*

An introduction to the tools and techniques of financial analysis and decision making. Topics covered include financial statement analysis, cost classification and behavior, cost-volume-profit analysis, incremental cost analysis, time value of money, capital budgeting, risk and return, capital structure and the cost of capital, international finance, financial modeling and planning, and working capital management. Spreadsheet programs are used extensively in this course. Prerequisite: GMI 210.

### **PHL 287. Seminar in Biomedical Ethics**

*Fall E, Spring LA; Baker*

An advanced historically based introduction to bioethics and clinical ethics focusing on such formalizations of medical morality as the Hippocratic Oath, the AMA codes, the Belmont Report and Beauchamp and Childress Principles, and the idea of casuistry. Major cases in bioethics will also be reviewed and the evolution of the core concepts and infrastructure of medical ethics and bioethics will be examined.

### **MED 200. Introduction to Health Systems**

*Fall D; Weiner*

This course examines the determinants of health, illness, and medical care utilization, institutional arrangements and settings for the delivery of acute and chronic care, the doctor-patient relationship, resource allocation, and the measuring and evaluating system performance.

### **MED 271. Clinical Leadership Practicum**

*Fall D; Lehrman*

Students will work in the field with a preceptor in a clinical leadership role. Students may be placed in a variety of health care settings including: hospitals, physician offices, health maintenance organizations, etc. Classes meet every other week to discuss students' field experiences and selected readings.

### **STA 201. Introduction to Probability and Statistics**

*Winter D; Bowman*

This course studies the fundamentals of applied probability, most important distributions, acceptance sampling, confidence intervals, point estimation, and testing of hypotheses.

### **HSS 256. Group Practice Administration**

*Winter E; Staff*

The objective of this course is to introduce students to the organization and management of private physician group practice through seminar and practical experience.

### **MED 201. Health Systems Management**

*Winter E; Strosberg*

This course examines managerial roles and processes within health service organizations—organization design, managerial epidemiology, governance, total quality management, human resource management, labor relations, and ethics. Prerequisite: MED 200.

### **MED 280. Health Policy and Information Systems**

*Winter E; Manna and Smith*

This course covers two main topics. The first (focusing on public policy formulation and implementation) is designed to provide an understanding of the political and regulatory environment of health care organizations. The second focuses on the role of information systems in the management and operation of health services organizations and how data derived from these systems can be utilized to assess and improve the health of defined populations.

### **MED 253. Economics of Health**

*Spring D; Lambrinos*

Examination of demand and supply for medical personnel; analysis of hospital cost, inflation, and health insurance. Discussion of issues in cost benefit analysis of public health and regulation of health care markets.

### **HSS217. Health Care Finance**

*Spring E; Ashman*

This course covers financial management in a regulated health care environment. Topics include cost-finding and third-party reimbursement, contemporary issues in health care financing, sources of capital, capital budgeting, financial planning and analysis, cost accounting, and managed care issues. Prerequisites: STA 201, GMI 210, GMI 212, MED 200.

### **HSS 274. Legal Aspects of Health Care**

*Spring E; Staff*

This course is designed to familiarize students with basic legal issues involved in managing health care systems. Antitrust, consent, labor law, malpractice, professional rights and other problems are explored using actual and hypothetical case studies. Prerequisite: MED 200.

**OPTIONAL ADVANCED SCIENCE COURSES**  
(See Union Undergraduate Catalog for descriptions):

- BIO 130. Animal Physiology**
- BIO 180. Biochemistry**
- BIO 154. Developmental Biology**
- BIO 170. Endocrinology**
- BIO 160. Histology**
- MED 044. Mammalian Anatomy**
- BIO 136. Mechanisms of Cell Regulation**
- BIO 25. Molecular Biology**
- BIO 140. Molecular Genetics**
- BIO 165. Neural Circuits and Behavior**
- CHM 30. Organic Chemistry**
- CHM 150. Physical Chemistry**
- BIO 46. Psychobiology**

**Educational Studies Programs**

**Location** . . . . . Lamont House - Graduate Center  
**Telephone** . . . . . (518) 388-6361  
**Fax** . . . . . (518) 388-6686

**Degrees Offered:**

- Master of Arts in Teaching
- Master of Science for Teachers of Mathematics and Science

**Director:** Patrick F. Allen

**Assistant Directors:** Beatrice Hall, Ken Blom

**The Master of Arts in Teaching (M.A.T.)**

The M.A.T. degree is designed for individuals who have completed a baccalaureate degree in a liberal arts discipline and who would like to teach subjects such as English, languages, mathematics, science, or social studies in secondary schools. This program provides the pedagogical course work and experience necessary for New York State provisional certification, grades 7-12. It also provides the opportunity to extend and deepen knowledge in the subject area of certification and the master's degree necessary for permanent certification.

**M.A.T. PROGRAM REQUIREMENTS**

The M.A.T. program requires **at least 10 courses:** 4-6 in pedagogy and 4-6 in the subject area for which certification is sought. **Core requirements are:** EDS 240 (Psychology of Teaching), EDS 240L (Psychology of Teaching Lab), one of the EDS 211-216 courses (Curriculum and Methods of Teaching English, languages, mathematics, science, social studies or technology), and EDS 250A (Seminar in Special Needs Populations), 250B and C (Seminars in Instruction and Evaluation). The program requires a teaching internship, master's research (either a two-term thesis in the discipline, or a one-term classroom-based project plus three or four electives.)

**ADMISSION TO THE M.A.T.**

Applicants to the program must have completed a B.S. or B.A. from an accredited institution with the equivalent of at least 30 semester hours (9 courses at Union College) in the liberal arts major area (English, language, mathematics, science, social sciences) in which they will seek certification. A minimum grade point average of 3.0 in undergraduate or previous graduate work is normally expected in this discipline, and overall. An interview, an essay, and **at least three references** are required, two of which must be academic. Evidence of intellectual achievement, motivation, and aptitude are necessary for admission.

Union College undergraduates are also eligible for a B.A./M.A.T. or B.S./M.A.T. combined degree program (see below). **Students may begin the combined degree program during any term, but must complete the intensive summer program prior to the beginning of their internship. Students expecting to begin the program in the summer must submit application materials no later than March 1 of the preceding spring. Students who plan to complete the course work and internship over a two- or three-year period may apply at any time in the academic year, but no later than March 1 of the year in which they intend to enroll in the special summer program.**

Interested students must see a program advisor before registering and may register for only two elective courses before matriculation. In addition to the admission requirements above, students are expected, before the special summer program, to have completed: 1) an undergraduate educational psychology course or the equivalent competency examination, 2) two weeks of structured field experiences as defined in Educational Studies Program literature, and 3) six units of literacy course work, as defined in Educational Studies Program literature. All students must complete one year of a foreign language at the college level or its equivalent before the college can recommend certification.

### **THE TEACHING INTERNSHIP**

Most M.A.T. candidates will complete a half-day, year-long internship in a secondary school, taking full responsibility for at least two classes. Students will be interviewed at the site(s) where they expect to intern. Students completing the program on a part-time basis may, under special circumstances, complete a one-semester, full-day internship from September through January. **Entrance into the internship portion of the program is contingent upon completion of Psychology of Teaching and the appropriate Curriculum and Methods course with minimum grades of B.**

### **MASTER'S RESEARCH AND THESIS**

The thesis generally comprises two of the 4-6 courses in the discipline. For students attempting to complete the program in one calendar year, the thesis is generally undertaken in the fall and winter terms. The thesis advisor is normally a faculty member in an academic discipline directly related to the student's area of certification.

### **THE M.A.T. PROJECT**

**In lieu of a thesis**, students may enroll in EDS 280, which involves carrying out classroom-based research in pedagogy as it relates to an academic discipline. Students who write an M.A.T. Project normally undertake it during the winter term with an Educational Studies faculty member. Opting to complete a project usually means enrolling in **one more elective course** in the discipline than those who undertake an M.A.T. thesis.

### **COMPUTER LITERACY**

Each student in the M.A.T. program is expected to leave the program with much greater computer literacy than the degree of literacy with which s/he entered. Students are expected to select as an elective one of the courses from among CST 265, 270, 271, or 277 unless s/he can demonstrate existing computer competence.

### **ELECTIVE COURSE WORK**

Students in the M.A.T. program are normally required to take at least three elective courses selected with the approval of their advisor. If the student chooses to undertake an M.A.T. Project in lieu of an M.A.T. Thesis, then the student must select an additional elective for a total of four graduate electives related to the area of certification. Courses are offered in the late afternoons and evenings during the academic year. With the approval of an advisor, up to two graduate-level courses may be transferred into the M.A.T.

### **POST-GRADUATE TEACHING CORE**

For some individuals already holding an advanced degree in a discipline related to their prospective teaching area, it may be unnecessary to complete the entire M.A.T. degree program in order to qualify for permanent certification. Selected students will be accepted into the Post-Graduate Degree Teaching CORE. The CORE consists of five graduate courses in pedagogy and a year-long internship. A full-time, eight-week summer term is required. Students who complete only the CORE are not normally recommended for certification by the Educational Studies program. Each CORE student must apply for certification on her/his own. That means each CORE student must meet the letter of New York State certification standards as defined by the Office of Teaching Certification.

### **B.A. OR B.S./M.A.T. COMBINED DEGREE PROGRAM**

To be eligible for the combined undergraduate/graduate degree program a student must be a Union undergraduate and must normally have a grade point average of at least 3.3. Students must apply to the program no earlier than their 8th term and no later than the end of their 10th term. Students will complete the usual requirements for the baccalaureate degree, including PSY 50 (Educational Psychology) and the non-credit structured field experiences (EDS 210 and EDS 220). In the summer prior to their last year (in most cases between the senior year and their graduate year), students will complete the graduate 8-week summer term of EDS 240 (Psychology of Teaching), EDS 240L (Psychology of Teaching Lab), and the appropriate Curriculum and Methods course, EDS 211-216. In the fall students will complete a two-week field observation, EDS 230. They will take EDS 250A, B, and C concurrently with the year-long teaching internship. In addition to the education courses required for certification, combined degree students must enroll in either a two-term thesis in the discipline or a one-term master's degree project. Students who undertake a thesis must enroll in one additional elective; students who undertake a project must enroll in two additional electives. For undergraduate and graduate work, students in the combined degree program will complete a minimum of 44 courses, allowing them to apply two of their courses to both the undergraduate and graduate degrees.

## NEW YORK STATE CERTIFICATION

Those students requesting New York State Certification through Union College should complete the “blue” certification form and attach a fifty-dollar **postal money order**. These documents should be sent to the Office of Graduate Studies in Lamont Graduate Center. Official transcripts should be requested from all colleges/universities attended and sent to the Office of Graduate Studies in sealed envelopes. The deadline for receiving this information is July 1 following graduation from the M.A.T. program. Anyone who has not completed this process by that date will be required to seek certification on his/her own.

## OUTLINE OF M.A.T. PROGRAM

**Prerequisites:** PSY 050 or equivalent, EDS 010, EDS 020 (non-credit, two weeks), or equivalent.

**Summer Session:** An 8-week intensive summer session is required of all students immediately prior to their internship comprised of EDS 240, EDS 240L, and EDS 211-216 (depending on major).

### Typical M.A.T. Full-time Program, One Year

#### Summer

EDS 211-216  
EDS 240 (internship)  
EDS 240L

#### Fall

EDS 250A  
EDS 251 (internship)  
EDS 298 (Thesis) OR Elective

#### Winter

EDS 250B  
EDS 252 (internship)  
EDS 299 (Thesis) OR EDS 280 (MAT Project)  
ELECTIVE

#### Spring

EDS 250C  
EDS 253 (internship)  
ELECTIVE

## COURSES OF INSTRUCTION FOR THE M.A.T.

### PSY 050. Educational Psychology

*Winter, Spring; Burns*

Principles of psychology applied to teaching, with emphasis on cognitive abilities of students, classroom management procedures, and motivational techniques. Visits to a variety of local schools. Prerequisite: PSY 010.

### EDS 211. Curriculum and Methods in Teaching English

*Summer; Moore*

Curricular planning and instruction for the teaching of English at the secondary school level. The course will include an analysis of secondary language arts curricula including New York State Frameworks for language arts, instructional techniques and strategies, designing and locating instructional materials, planning, implementing, and evaluating lessons and units. Only matriculated M.A.T. students may enroll in this course.

### EDS 212. Curriculum and Methods in Teaching Mathematics

*Summer; Jovell*

Curricular planning and instruction for the teaching of mathematics at the secondary school level. The course will include an analysis of classic and current secondary mathematics curricula including New York State Frameworks for mathematics, instructional techniques and strategies, designing and locating instructional materials, planning, implementing, and evaluating lessons and units. Only matriculated M.A.T. students may enroll in this course.

### EDS 213. Curriculum and Methods in Teaching Languages

*Summer; Remaley*

Curricular planning and instruction for the teaching of modern and classical languages at the secondary school level. The course will include an analysis of secondary language curricula including New York State Frameworks for languages; instructional techniques; the teaching of speaking, listening, reading, and writing; designing and locating instructional materials; planning, implementing, and evaluating lessons and units. Only matriculated M.A.T. students may enroll in this course.

### EDS 214. Curriculum and Methods in Teaching Sciences

*Summer; Scott*

Curricular planning and instruction for the teaching of science at the secondary school level. The course will include an analysis of secondary science curricula including New York State Frameworks for sciences; instructional techniques and strategies for teaching scientific concepts; laboratory methods and safety, designing and locating instructional materials; planning, implementing, and evaluating lessons and units. Only matriculated M.A.T. students may enroll in this course.

**EDS 215. Curriculum and Methods in Teaching Social Sciences**

*Summer; Reynolds*

Curricular planning and instruction for the teaching of social sciences at the secondary school level. The course will include an analysis of secondary social studies curricula including the New York State Frameworks for social studies; models and techniques for teaching and integrating the various social sciences; designing and locating instructional materials; planning, implementing, and evaluating lessons and units. Only matriculated M.A.T. students may enroll in this course.

**EDS 216. Curriculum and Methods in Teaching Technology**

*Summer; Staff*

Designed for those with a technology or engineering background, this course will help prepare technology educators to promote students' learning by the use of multiple instructional models. The course builds teacher skills in lesson planning, content organization, and hard and software evaluation and use. New York State Standards for technology and evolving approaches to integration of technology in the teaching/learning process will also be explored. Only matriculated MAT students may enroll in this course.

**EDS 240. Psychology of Teaching**

*Summer; Allen, Blom, Hal*

Theories of learning and memory applied to instruction; models and research on teaching in secondary schools. This course will include a laboratory component with micro-teaching experiences and will be taken in the summer preceding the teaching internship. Only matriculated M.A.T. students may enroll in this course. (Co-requisite: EDS 240 Lab)

**EDS 240L. Microteaching Laboratory**

*Summer; Keeley, Merriman, P. Reynolds*

Students prepare and present several 5-30 minute lessons using a variety of instructional models. Lessons are videotaped and critiqued by peer-coaches and laboratory faculty. This laboratory must be taken concurrently with EDS 240 and a course in Curriculum Methods in Teaching (EDS 211-215). Only matriculated M.A.T. students may enroll in this course.

**EDS 250A. Special Needs Seminar: Drug, Alcohol, Child Abuse**

*Fall; Kelley, Kennedy*

This seminar is required of all M.A.T. candidates and is to be taken concurrently with their internship. This course explores major aspects of special needs populations in schools including State mandates; laws dealing with the handicapped; gifted and talented students; the instruction required for teachers in drug, alcohol, and child abuse; and projects to increase teachers' competence in working with special needs populations. Only matriculated M.A.T. students engaged in an internship may enroll in this course.

**EDS 250B. Seminar in Instruction and Evaluation**

*Winter; Blom, Staff*

This seminar is required of all M.A.T. candidates and is to be taken concurrently with their internship. Topics include: application of instructional theory and research, reflective teaching and self-evaluation, traditional and alternate/performance assessments. Each student will produce a professional portfolio and a teaching videotape in this course. Only matriculated M.A.T. students may enroll in this course.

**EDS 250C. Seminar in Instruction and Evaluation**

*Spring; Blom, Hall*

This seminar is required of all M.A.T. candidates and is to be taken concurrently with their internship. Topics include: application of instructional theory and research, reflective teaching and self-evaluation, exposure to major school reform movements/proposals, and the relationship of new teachers to the reform movement. Only matriculated M.A.T. students may enroll in this course.

**EDS 251, 252, 253. Teaching Internship (No Fee)**

*Fall, Winter, Spring; Allen*

Graduate interns teach a minimum of two courses in a local secondary school under the direction of an experienced school mentor and a college supervisor. Students meet several times a semester on campus in addition to their teaching responsibilities. Only matriculated MAT students may be enrolled in an internship.

**EDS 252A. Internship Abroad (No Fee)**

*(Not offered 2000-2001)*

Foreign language interns who go abroad during the winter term normally take four courses: an independent study in the foreign language of the country in which they study; and independent study in the culture of the country they visit; and independent study in education; and an internship. Registration fees for the courses taken abroad, travel and living expenses are the responsibility of the student, although there is no fee for the teaching internship.

**EDS 254. Full Day Internship**

*September – January; Allen*

A full-day, September through the end of January, this alternative internship is available for selected students with special circumstances. Advisor approval required.

**EDS 270. Growing Up in America: Issues of Diversity**

*Fall, Spring; Hanifan*

Childhood and coming of age will be examined through the works of a diverse group of American writers. The class will read and respond to biographies, autobiographies, fiction, and personal essays that grapple with building, personal, cultural, or social identities. Discussions will include such issues as the role of education for immigrants and disadvantaged populations, racism, affirmative action, bilingual instruction, and cultural diversity.

### **EDS 280. M.A.T./M.S. For Teachers Project**

*Winter; Hall, Hanifan, Kennedy*

Individual and group projects relating to the classroom teaching of a particular discipline. Typical projects are: systematic applications of an instructional model of a major segment of curriculum in a teaching subject area; classroom action research; addressing curricular or instructional questions/issues within one's teaching subject area.

### **EDS 190-290. Independent Study in Educational Studies**

**EDS 298-299. Research and Thesis in the Discipline**  
*Fall, Winter*

### **EDS 300. Status Continuation (\$100)**

Graduate students who are degree candidates and are working on their thesis must pay a continuation fee for any term in which they are not formally enrolled in any other course counting toward the completion of their degree.

### **EGL 210. Writing and Teaching: A Process Approach**

*Fall; C. Reynolds*

This writing workshop includes the discussion and application of current theory in composition. Students will read and discuss critical issues in rhetoric and composition, will apply theory to classroom teaching situations in a variety of disciplines, and will participate in small writing groups to critique their own and classmates' personal writing.

## **The Master of Science for Teachers of Mathematics and Science**

This graduate program is designed for individuals who already hold provisional certification with the State of New York and wish to gain the master's degree necessary for permanent certification. The program offers courses in topics of contemporary importance in the life sciences, physical sciences, mathematics, and computer fields. Courses are designed to provide information in specific subject areas and their integration into the classroom. The program enables teachers to enhance their subject matter competence, to develop further competence in their present teaching assignments, to move from one subject area or teaching level to another, or to meet additional certification requirements. A different selection of courses is offered each academic year.

The M.S. degree in science or mathematics is awarded for the completion of **ten courses** (33 credits). Normally, five courses are taken in one of three general subject areas: Life Science (biology), the Physical Sciences (chemistry, geology, physics), or the Mathematics/Computer field. Students interested in the degree must consult an academic advisor in planning their program of study and should matriculate no later than the end of their second course. One or two graduate level courses from other institutions

may be transferred into the program, as determined by a faculty advisor.

### **ADMISSION TO THE PROGRAM**

Applicants to the program must have completed a B.A. or a B.S. from an accredited institution. A minimum grade point average of 3.0 in undergraduate and/or previous graduate work is normally expected. An interview, an essay, and at least three references are required, two of which must be academic. Evidence of intellectual achievement, motivation, and aptitude are necessary for admission. Students may complete the degree on a part-time or full-time basis and may apply at any time during the year.

### **MASTER'S RESEARCH AND THESIS**

The thesis generally comprises two of the five courses in the discipline area of concentration. The thesis advisor is normally a faculty member in the academic discipline.

### **THE M.S. FOR TEACHERS OF MATHEMATICS AND SCIENCE PROJECT**

**In lieu of a thesis**, students may enroll in EDS 280, which involves carrying out classroom-based research in pedagogy as it relates to the discipline of the student's academic concentration. Students who write an M.S. for Teachers of Mathematics and Science Project normally complete it during the winter term with an Educational Studies faculty member. Electing to complete a project usually means **one more required elective** in the discipline over what is required for the M.S. for Teachers thesis.

### **ELECTIVE COURSE WORK**

M.S. for Teachers students are normally required to take five elective courses beyond the five courses required in their discipline area; these courses are selected with the approval of an advisor. Graduate courses in the subject area of certification and in education-related subjects are offered in the late afternoons and evenings of the academic year. With the approval of an advisor, up to two graduate-level electives may be transferred into the M.S. for Teachers.

### **COMPUTER LITERACY**

Each student in the M.S. for Teachers program is expected to leave the program with a much greater computer literacy than that with which s/he entered. Students who enter with less than basic computer knowledge must take CST 265. Students who are admitted with a greater level of computer literacy/facility than CST 265 are expected to include as an elective one of the courses selected from among 270, 271, 277, 278, 279 or demonstrate competence in one of these areas.

## **COURSES OF INSTRUCTION IN COMPUTER EDUCATION**

### **CST 265. Introduction to Computers in the Classroom**

*Fall; Wilkinson*

This core course is required of all students specializing in computers who have not had a similar course in their previous study. It is strongly recommended for all students in any education program who have had little or no exposure or knowledge of computers, computer systems, and their basic applications: word processing, databases, and spreadsheets. Emphasis will be placed on what computers do, how they can be used, an understanding of the various parts of the hardware, loading programs, running programs, the primary and secondary storage capabilities and their functions. All students will become familiar with word processing, spreadsheets, databases, and their applications. A basic introduction to e-mail, the Internet, and some of their basic uses in the classroom will also be included, along with an elementary explanation of programming through the use of Quick Basic or another introductory programming language.

### **CST 270. Computers in the Language Arts Classroom**

*Fal; Reynolds*

Investigates the potential of microcomputer technology to improve reading, writing, study, communication, and second language skills. During the first five weeks, many tools, techniques, and materials will be presented through demonstrations, readings, lectures, and lab sections. Class members will further explore one or more of these areas and develop an implementation plan during the second portion of the course. Students should have an acquaintance with computers but do not need to be programmers. Some Logo or Carol the Robot is helpful.

### **CST 271. Computers in the Math and Science Classroom**

*Spring; Wilkinson*

Investigates the potential of new technology for improving the teaching of math and science. Special attention is given to the advanced uses of spreadsheet and database software in the secondary curriculum. Course discussions will emphasize the educational applications of computer technology rather than software development. Advanced use of e-mail, the Internet, and World Wide Web will be taught as well.

### **CST 277. Hypermedia, Hypercard and Other Multi-Media Applications (\$1105)**

*Fall, Winter; Staff*

Working with simple authoring languages, this course will also develop each student's capacity to work with graphics and multimedia in the classroom to create presentations and classroom demonstrations. Developing the capacity to work with drawing and desktop publishing, this course will be an asset for teachers in any discipline.

### **CST 278. Programming in C++ for the Classroom**

*Not offered in 2001-2002*

Since all secondary Advanced Placement courses in computer science will use C++ as the programming language as of the Fall of 1999, this course serves as an introduction to C++ as a programming language along with some of its classroom applications.

### **CST 279. Teaching with C++ in the Classroom**

*Not offered in 2001-2002*

Once teachers have learned to program with C++ and to use basic applications, developing their facility to create sophisticated classroom applications and create advanced learning situations will enhance their ability to work productively with advanced students. Prerequisite: CST 278.

# Engineering and Computer Science

**Location** . . . . . Steinmetz Hall  
**Telephone** . . . . . (518) 388-6530

**Dean of Engineering and Computer Science:**  
Robert T. Balmer

**Chair of Computer Science:** David Hemmendinger

**Chair of Electrical Engineering:** Ekram Hassib

**Chair of Mechanical Engineering:** Ann Anderson

**Professors:** Chang, Fatic, Gajjar, Hannay, Milillo, Rudko, Traver, Williams;

**Associate Professors:** Anderson, Bucinell, Hassib, Hemmendinger, Spinelli, Wicks, Wilk;

**Assistant Professors:** Fernandes, Keat, Krouglicof;

**Distinguished GE Research Professor of**

**Engineering:** Philip G. Kosky;

**Instructor:** Spallholz;

**Lecturer:** Almstead

**Visiting Lecturer:** Marten

## Degrees Offered:

- Master of Science in Computer Science
- Master of Science in Electrical Engineering
- Master of Science in Mechanical Engineering

The programs described in this section lead to Master of Science degrees in Computer Science, Electrical Engineering, and Mechanical Engineering.

## REQUIREMENTS FOR THE MASTER OF SCIENCE IN COMPUTER SCIENCE

The Master of Science in Computer Science requires a minimum of **nine computer science courses**, including CSc 136, three 200-level courses numbered below 290, and two courses as a thesis or project. The nine courses must include a course from each of the areas: computational theory, programming languages, software systems, and hardware systems. **The courses are:**

- Computational theory CSc 140, CSc 242
- Programming languages CSc 144, CSc 231, CSc 250
- Software systems CSc 135, CSc 160, CSc 233, CSc 248
- Hardware systems CSc 118, CSc 152, CSc 154, CSc 237

Each candidate must successfully complete a master's comprehensive examination on the major areas of computer science.

Students who have extensive software experience may petition to take graduate computer science courses instead of the thesis/project requirement.

The following are additional required courses beyond the minimum nine: CSc 75 for students without discrete mathematics and logic design; CSc 76 for students who do not know C++ or computer organization; and CSc 77 for students with a background in data structures. All students entering the master's program must pass candidacy exams that cover the material in CSc 75, 76, and 77, unless they have passed these or similar courses with grades of B or better.

## REQUIREMENTS FOR THE MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

The electrical engineering profession involves the design and manufacture of electrical products and devices. Typical applications include digital computers, digital and analog control systems, communication systems, electric machinery and power systems, solid-state electronics, and electromagnetics.

A minimum of **ten graduate courses** is required. Each student's program should include at least seven electrical engineering courses and three technical electives. At least six of the electrical engineering courses should be at the 200 level. Each student should, in conference with the graduate advisor, plan a complete graduate program prior to taking any courses for graduate credit.

Technical electives should normally be chosen from graduate level courses in electrical engineering, computer science, mechanical engineering, mathematics, and physics. Every course taken for graduate credit must be approved by the advisor. A thesis could be considered as one or two technical electives. Students with weak backgrounds may need to take more than ten courses.

## REQUIREMENTS FOR THE MASTER OF SCIENCE IN MECHANICAL ENGINEERING

The mechanical engineering profession involves the use of the fundamentals of mechanics, materials, thermodynamics, and systems analysis as they apply to the design and manufacture of engineering devices and systems. The curriculum provides ample opportunities for individual project work under the direction of the department faculty. Graduates of this program are prepared to enter any of the major branches of mechanical engineering, including control instrumentation, energy systems, and thermal and nuclear power generation.

The M.S.M.E. requires a total of **ten courses**. Three of the courses will form a core in mechanical engineering and must be taken by all students at the start of the program: MER 202 Engineering Analysis, MER 200 Elasticity, and MER 201 Transport Phenomena. Of the remaining seven courses, four must be in the mechanical engineering major at the 200 level. The remaining courses are selected from

## MSEE AND MSME DEGREES SUMMARY

MS Program	Electrical Engineering (10 Courses Required)	Mechanical Engineering (10 courses Required)
<i>Elective MS Thesis:</i>	Not required, but counts as 2 technical electives if completed.	Not required, but counts as 2 technical electives if completed.
<i>Elective MS Project:</i>	Not required, but counts as 1 technical elective if completed.	Not required, but counts as 1 course. ME's can also do a Case Studies Methods course.
<i>Core Program Required?:</i>	No.	Three courses in the areas of eng. analysis, elasticity, and transport phenomena.
<i>Remaining Program:</i>	Seven EE courses (six at the 200 level) plus three technical electives.*	Four ME courses at the 200 level plus three technical electives.*
<i>Master's Exam Required?:</i>	No.	No.

\* Technical electives are normally chosen from graduate level courses in engineering, computer science, mathematics, or physics with the consent and approval of the student's advisor.

engineering (mechanical or electrical), computer science, and mathematics. Because not all courses from these areas are satisfactory selections, all course selections must be approved by the graduate advisor before course registration. Each student must submit a program plan of study (to be approved by the advisor) before completion of the first course taken for graduate credit.

For students who wish to concentrate in a specific area, the department offers course selections in the thermal-fluids and mechanics areas. Students wishing to focus on the thermal-fluids area may choose from among the following courses: MER 232, 234, 235, 236, 237, 238, 240, 250, 252, 254, 260, 339. Students wishing to focus on the mechanics area may choose from among the following courses: MER 208, 110, 212, 214, 216 (currently 116), 222, 225, 132, 301, 319, 329.

Full-time degree candidates are required to do **Research and Thesis** for two courses. Part-time degree candidates normally complete MER 292a, b Master's Project (one course) or MER 210a, b Case Studies Methods (one course); however, they may do a thesis with departmental approval. All students, either part-time or full-time, intending to do Research and Thesis must consult the department for appropriate guidance.

## COMPUTER SCIENCE

### CSc 75. Topics in Computer Logic and Mathematics *Spring; Staff.*

Introductory logic, set theory, and Boolean algebra; number systems, computer organization, and elementary combinational and sequential circuits; data representation, propositional calculus. Prerequisites: Calculus and programming experience. Not normally open to undergraduates or to students with credit for Math 99 or EEr 18.

### CSc 76. Structured Programming and Computer Organization

*Fall; Staff.*

Structured programming and design techniques through the development of software tools. Algorithms will be implemented in C++ and assembly language. Prerequisite: Previous programming experience. Not normally open to undergraduates or to students with credit for CSc 37 or 40.

### CSc 77. Data Structures

*Winter, Spring; Fernandes.*

Basic concepts of data organization and abstraction, software design, stacks, queues, trees, and their implementation with linked structures. Sorting and searching techniques. Prerequisites: CSc 37 or Esc 14 or CSc 76.

### CSc 118. Digital Design

*Winter.*

(See EEr 118).

### CSc 135. Operating Systems

*Spring; Williams.*

Batch, interactive, real-time, and distributed operating systems; multiprogramming, multiprocessing, multiplexing, multitasking; concurrent programming; elementary queuing theory; memory management; resource allocation, sharing and protection. Prerequisites: CSc 40 and 77, and either Math 99 or CSc 75.

### CSc 136. Advanced Programming Techniques

*Fall, Winter; Williams.*

Fundamental algorithms used in a variety of applications. Includes algorithms on list processing, string processing, geometric algorithms, and graph algorithms. Includes a laboratory. Prerequisites: CSc 77 and either Math 99 or CSc 75.

**CSc 137. Data Communications and Networks**

*Fall; Staff.*

An introduction to protocols, communication hardware, networks, error detection and handling, and software. Prerequisite: EEr 18 or CSc 75. A knowledge of statistics is helpful.

**CSc 140. Theory of Computing**

*Fall; Hannay.*

A discussion of the fundamental ideas and models underlying computing—properties of formal languages, finite automata, regular expressions, pushdown automata, context-free languages, Turing machines, and undecidability. Prerequisites: CSc 77, and either Math 99 or CSc 75.

**CSc 144. Functional, Logic, Object-oriented Languages**

*Winter; Hemmendinger.*

An introduction to issues in programming language design and implementation. Major programming language paradigms: functional, logic, and object-oriented, and their use. Prerequisites: CSc 77 and either Math 99 or CSc 75; recommended: CSc 136.

**CSc 146. Computer Graphics**

*Winter, Staff.*

Algorithms for handling two-dimensional and three-dimensional objects. Interactive graphics hardware and systems. X windows, engineering workstations. Includes a laboratory. Offered alternate years. Prerequisites: CSc 77 and Math 15, C programming experience.

**CSc 148. File Structures and Processing In Information Systems**

*Fall; Fernandes.*

Introduction to database systems. Methods of organizing and processing data in an efficient manner. Procedures for creating and updating sequential, indexed and relative files; sorting and merging files. A suitable high-level language will be used as a vehicle for this material. Prerequisite: CSc 77.

**CSc 152. Microprocessors and Microcomputer: Architecture, Programming, and Applications**

*Spring; Staff.*

(See EEr 152)

**CSc 154. VLSI System Design**

*Fall, Traver.*

(See EEr 154)

**CSc 160. Software Engineering**

*Spring; Almstead.*

Strategies for the design, production, and support of computer programs, software development models and phases, programming team structures, test structures, documentation, and maintenance. Prerequisite: CSc 136.

**CSc 181, 182. Programming Project**

*Fall, Winter, Spring; Staff.*

Individual or team projects designed in conjunction with the instructor. Special application form must be completed to register for this course. Prerequisites: At least three computer science courses beyond CSc 77 and permission of the instructor. CSc 181 is a prerequisite for CSc 182.

**CSc 183. Selected Topics in Computer Science**

*Staff.*

Prerequisite: Permission of the instructor.

**CSc 231. Computer Language Translators**

*Spring; offered 2002-2003.*

The modules of a compiler and their functions. Lexical processor, syntax analyzer. Symbol table access methods, scanning arithmetic expressions, error recovery, code generation. Offered alternate years. Prerequisite: CSc 140.

**CSc 233. Software Tools For Systems Programming**

*Spring; Williams.*

Seminar on software tools for system programming. Software for the personal computer—interface for Windows, keyboard, sound, and mouse events—which promote direct user interaction in the computational process. Offered alternate years. Prerequisites: CSc 135 and permission of instructor.

**CSc 236. Computer Network Protocols**

*Spring; Spinelli.*

See EEr 236.

**CSc 237. Comparative Computer Architecture**

*Fall; offered 2002-2003.*

Study of computer architectures, with an emphasis on RISC processors, performance metrics, datapath and control, pipelines, cache design, and parallel instruction execution. Offered alternate years. Prerequisites: CSc 135 and either EEr 18 or CSc 75.

**CSc 238. Data Base Organization and Management**

*Winter; offered 2002-2003.*

Introduction to data base system architecture; relational, hierarchical, fourth generation language, and network approaches to data base design are studied. Offered alternate years. Prerequisite: CSc 148.

**CSc 242. Analysis and Design of Computer Algorithms**

*Winter; Williams.*

The analysis of time and space requirements of algorithms; the design of efficient algorithms using techniques such as divide and conquer, and dynamic programming; efficient algorithms for graph problems, matrix multiplication, fast Fourier transforms, polynomial multiplication, pattern matching; introduction to complexity theory. Offered alternate years. Prerequisite: CSc 136.

**CSc 244. Artificial Intelligence**

*Winter; Staff.*

Fundamental concepts used in creating "intelligent" computer systems; semantic representation, logical deduction, natural language processing, and game playing; expert systems, knowledge-based systems, and elementary robotics. Offered alternate years. Prerequisite: CSc 136.

**CSc 248. Concurrent Programming**

*Winter; offered 2002-2003.*

Survey of synchronization and communication in concurrent programs; introduction to concurrent programming languages and systems such as Java and MPI; computation in distributed and multi-processor systems. Offered alternate years. Prerequisite: CSc 136; Recommended: CSc 135.

**CSc 250. Programming Languages**

*Fall, Hemmendinger.*

Advanced issues in programming languages design; descriptions of syntax and semantics, types, binding time, run-time systems. Projects will include implementations of small programming-language interpreters. Offered alternate years. Prerequisites: CSc 136 and 144.

**CSc 255. GMI 255 Seminar in Computer Management Systems**

*Spring; see GMI 255.*

**CSc 290-293. Independent Study**

*Fall, Winter, Spring; Staff.*

Prerequisite: At least two CSc courses numbered between 200 and 289.

**CSc 294-295. Two-Term Programming Project**

*Fall, Winter, Spring; Staff.*

Prerequisite: At least two CSc courses numbered between 200 and 289.

**CSc 296-298. Research and Thesis**

*Fall, Winter, Spring; Staff.*

Prerequisite: At least two CSc courses numbered between 200 and 289.

**ELECTRICAL ENGINEERING****EER 100. Electrical Engineering History**

*Not offered 2001-2002.*

A survey of major developments in electricity and electrical engineering technology, from the experiments of Benjamin Franklin through the development of the internet. Understanding technology within the cultural and societal contents in which it is developed. Prerequisite: Esc 25. Gen. Ed.: AM-CS; Eu-CS; WAC.

**EER 110. Electronic Devices**

*Not offered 2001-2002.*

Terminal characteristics and theory of electronic devices; band theory, photo and electronic effects, PN junctions; bipolar and field effect transistors, discrete and integrated electronics. Prerequisite: EE 48.

**EER 112. Application of Integrated Circuits**

*Not offered 2001-2002.*

Electronic processing of signals; properties of linear and hybrid integrated circuits; design of linear, nonlinear and hybrid electronic systems, active filter networks. Design projects required. Prerequisite: EE 63, 66, or permission of instructor.

**EER 118. Digital Design**

*Winter; Traver.*

The design of digital hardware systems at the module level using modern approaches. Datapath and control unit design, hardware description languages, minimization, pipeline. Laboratory exercise and a design project are required. Prerequisite: EE 18.

**EER 129. Neural Networks**

*Spring; Rudko.*

Topics include the biological basis of artificial neural networks, neuron models and architectures, backpropagation, associative and competitive learning. Weekly computer laboratories and a final project required. Prerequisite: Linear Algebra and Differential Equations, CSc 77 for CS students.

**EER 130. Fuzzy Logic**

*Not offered 2001-2002.*

Topics include fuzzy sets and relations, membership functions, defuzzification, classical logic and fuzzy logic, fuzzy rule-based systems, nonlinear simulation, decision making, pattern recognition and control systems. Prerequisite: Calculus and Linear Algebra, CSc 77 for computer science students.

**EER 133. Communication Circuits**

*Not offered 2001-2002.*

Communication circuits, including coupling networks, electrical noise, high-frequency amplifiers, mixers, phase-lock loops, high efficiency and broadband amplifiers, modulators and demodulators, pulse modulation techniques. Each week: Three lab hours. Design projects required. Prerequisite: EE 50, 63, or permission of the instructor.

**EER 137. Data Communications and Networks**

*Fall; Staff.*

An introduction to protocols, communication hardware, networks, error detection and handling, and software. Prerequisite: EEr 18 or CSc 75. A knowledge of statistics is helpful.

**EER 141. Energy Conversion**

*Fall; Fatic.*

Theory of electromechanical energy conversion; characteristics of transformers and dc. induction, and synchronous machines. Prerequisite: ESc 25.

**EER 142. Power Electronics**

*Not offered 2001-2002.*

Rectifying devices and rectifier circuits: device characteristics, waveforms, harmonic content filtering. Controlled rectifiers (thyristors, triacs): device characteristics, single phase and multiphase systems. Snubber circuits and device limitations. DC-DC converters: design, application, topologies. Energy storage element selection and design: capacitors and inductors. Prerequisites: EE 40, 48.

**EER 143. Introduction to Electromagnetic Engineering I**

*Winter; Chang.*

Travelling waves: transmission lines; Electrostatics; Magnetostatics; Applications to engineering problems; Solutions by analytical and numerical techniques. Prerequisites: Math 17, Physics 18 or EE 40.

**EER 148. Digital Circuits**

*Winter; Hassib.*

Special circuitry of digital systems; transistors as switches, logic gate types (RTL, DTL, TPL, ECL, MOS, CMOS, etc.), digital ICs semiconductor memories. Design projects required. Prerequisite: EE 18, 48, or permission of the instructor.

**EER 152. Microprocessors and Microcomputers: Architecture, Programming, and Applications**

*Spring; Gajjar.*

Hardware and architecture with emphasis on Motorola 68HC11; programming in assembly and higher-level languages, microcomputer applications, and interfacing. Design projects required. Prerequisites: Knowledge of computer programming and EE 18.

**EER 154. VLSI System Design**

*Fall; Traver.*

Design of very large scale integrated systems including structured design, stick diagrams, delay time estimation. Design from logic to physical levels; CAD tools for layout and simulation. Design projects required. Prerequisites: EE 18 and 48.

**EER 160. Power System Analysis I**

*Not offered 2001-2002.*

Power and energy in AC circuits. Single phase, three-phase and polyphase circuits in balanced and unbalanced regimes. Measurement of three-phase power. Determination of three-phase sequence. Single-line diagrams. Per-unit method of representation and computations. Transformers and synchronous machines in power systems. Parameters of transmission lines. Prerequisite: ESc 25.

**EER 161. Power System Analysis II**

*Not offered 2001-2002.*

Wave-propagation in transmission lines. Analysis of power networks, load-flow solutions and control. Three-phase faults and symmetrical components. Power system protection. Stability of power systems. Prerequisites: ESc 25.

**EER 163. Fundamentals of Wireless Electronics**

*Fall; Chang.*

Maxwell's equations, wave equations, boundary conditions, polarization, reflection of transmission waves, transmission lines, waveguides and resonators, antennas. Prerequisite: EE 143.

**EER 190-196. Independent Study**

*Fall, Winter, Spring.*

**EER 197, 198, 199. Capstone Design Project****EER 202. Advanced Circuit Analysis**

*Fall; Fatic.*

General network theory, matrix methods. Topological matrices applied to loop, node, node-pair, mixed variable, and state equations. Linear, nonreciprocal, and active networks. Prerequisite: EE 60 or equivalent.

**EER 210. Semiconductor Device Theory**

*Not offered 2001-2002.*

In-depth examination of the physical operation of basic semiconductor devices such as diodes, bipolar transistors, junction and metal-oxide-semiconductor field effect transistors. Determination of internal parameters that contribute to device performance. Prerequisite: EE 110 or permission of the instructor.

**EER 220. State Space Analysis**

*Winter; Fatic.*

Formulations of state equations, Matrices and determinants. Main concepts of linear algebra. Eigenvalues and Eigenvectors. Solutions of state equations by EV-EVR methods. Prerequisites: EEr 40, 60.

**EER 221. Modern System Theory**

*Spring; Fatic.*

Continuation of EE 220. Functions of matrices; Cayley-Hamilton's theory. Time-varying systems, Controllability and observability. Nonlinear systems and Lyapunov's stability. Prerequisites: EE 66, 220.

**EER-224. Random Processes**

*Not offered 2001-2002.*

Review of discrete probability, Random processes. Markov chains and Queuing Theory. Applications to communication systems, and computer networks. Prerequisite: Some probability knowledge desirable.

**EER 225. Non-Linear Optimization**

*Not offered 2001-2002.*

Extremization of objective functions (cost, performance, etc.) subject to constraints in the form of equalities and inequalities. Method of Lagrangian Multipliers. Kuhn Tucker conditions. Gradient search algorithm. Penalty functions. Direct methods of variational calculus and their application to approximate solutions of problems in electric circuit theory. Economics of electric power networks. Prerequisite: Undergraduate math and linear algebra.

**EER 226. Optimal Control Systems**

*Not offered 2001-2002.*

Introduction to the theory and applications of optimal control. Development of Bellman's dynamic programming, variational methods and Pontryagin's maximum principle. Applications to the synthesis of optimal regulators and trackers. Solution of control problems with minimum time, energy or fuel consumption. Problems with singular intervals. Numerical methods for optimization. Prerequisites: Background in control theory and better than average mathematical ability. EE 220 helpful, but not necessary.

**EER 228. Computer Based Control Systems**

*Not offered 2001-2002.*

Sampling and reconstruction of analog signals, sampled data, z-transform, the computer as a control element, state-space representation of digital control systems, quantization effects, controllability; observability, stability. Prerequisite: ME 120 or EE 66 or equivalent.

**EER 236. Computer Network Protocols**

*Spring; Spinelli.*

Design, analysis, and operation of communication protocols for computer networks; the Internet, TCP/IP, addressing, switching, routing, congestion control, application protocols. Prerequisites: EE 18, programming ability.

**EER 237. Comparative Computer Architecture**

*Not offered 2001-2002.*

Study of computer architectures, with an emphasis on RISC processors, performance metrics, datapath and control, pipelines, cache design, and parallel instruction execution. Offered alternate years. Prerequisites: CSc 135 and either EER 18 or CSc 75.

**EER 243. Introduction to Antenna Theory**

*Not offered 2001-2002.*

Propagation of electromagnetic waves, antenna impedance-integral equations, method of moments, arrays, wire antennas, aperture antennas, receiving antennas. Prerequisites: EE 143, 163 or equivalent.

**EER 244. Digital Communications**

*Not offered 2001-2002.*

Elements of a digital communication system, digital source coding, error correction, introduction to information theory, channel models, signaling waveforms, optimum reception and detection. Prerequisites: EE 50, 124.

**EER 246. Digital Signal Processing**

*Not offered 2001-2002.*

Discrete sequences, sampling, z-transform, discrete and fast-Fourier transforms, discrete filter realizations, filter design based on analog, Butterworth, Chebyshev, Elliptic low pass filters, windowing and quantization effects. Prerequisite: EE 60.

**EER 250. Opto Electronics**

*Not offered 2001-2002.*

Wave propagation in a homogeneous medium, guidance conditions and mode determination of dielectric waveguides, radiation modes, prism coupling, evanescent field coupling, integrated optic guides, graded index materials, mode coupling, loss and attenuation mechanisms. Prerequisite: EE 163 or equivalent.

**EER 256. Detection, Estimation and Filtering**

*Not offered 2001-2002.*

Decision criteria, estimation of their parameters, Wiener and Kalman filters. Prerequisites: EE 50 and some knowledge of probability or EE 51.

**EER 181, 182, 183, 281, 282, 283. Special Topics in Electrical Engineering**

Topics chosen from the current literature according to faculty and student interest. Possible topics include new developments in the major areas of electrical engineering such as electromagnetic fields, communications, controls, circuits, power, devices, electronics, and computer design. Topics may include but not be limited to image processing, machine vision, speech synthesis, integrated optics, antenna systems, adaptive filtering, variational methods, stochastic processes, optical communications, space and satellite communications, superconducting alternators, numerical methods, fault tolerant design, and computer networks. Each of these special topics courses has a variable content addressing specific current areas of interest to students. They will be offered whenever the need arises.

**EER 290. Independent Study****EER 296-298. Research and Thesis**

*Fall, Winter, Spring.*

**EER 300. Status Continuation**

## **MECHANICAL ENGINEERING**

**Key:** D (Day) E (Evening)

### **ESC 122. Principles of Production and Manufacturing Processes**

*Fall D*

Fundamentals of manufacturing processes are examined with regard to material properties and product reliability. Topics include fabrication, machining, joining, and quality control. Prerequisites: ESC 22.

### **MER 132. Composite Materials Technology**

*Winter E*

A comprehensive introduction to composite materials and motivation for their use in modern applications. Topics include selection and availability of composite materials, manufacturing processes, usable theoretical concepts, testing and characterization of composites, and strength theories. Prerequisites: ESC 22, ESC 23.

### **MER 166. Heating, Ventilation and Air Conditioning**

*Spring E*

Factors affecting human comfort and health, and the properties of moist air and conditioning processes for thermal environmental control. Use of ASHRAE data and psychometric charts. Calculation of heating and cooling loads. Analysis and design of HVAC systems. Application of solar energy for heating and cooling. Prerequisite: MER 62, or permission of the instructor.

### **MER 200. Elasticity**

*Spring E*

The behavior of substances, which possess the property of recovering their size and shape when forces producing deformation are removed. Review of stress and strain; study of two-dimensional problems in rectangular, polar, and curvilinear coordinates; introduction to three-dimensional problems; torsion and bending. Prerequisites: Math 17, 19, 31, MER 43 or equivalent.

### **MER 201. Transport Phenomena**

*Winter E*

The fundamentals of momentum, energy, and mass transfer and their analogous transport mechanisms. One-dimensional transport, transport properties, transport with internal generation, transfer coefficients, convective and turbulent transport. Prerequisites: Math 31, MER 50, or equivalent.

### **MER 202. Engineering Analysis**

*Fall E*

Topics in applied mathematics needed to analyze and model engineering problems by constructing mathematical models for a physical situation and the reduction of the ensuing mathematical problems to numerical procedures. Matrices, linear algebra, vector and tensor calculus, partial differential equations, calculus of variations, finite element and difference techniques, Fourier series and integrals. Prerequisites: Math 17, 19, 31, or equivalent.

### **MER 203. Welding Metallurgy**

*Fall E*

Detailed consideration of welding processes, selection of parameters, metallurgical factors, weld integrity, analysis of weld failures, examples of welding problems in engineering and manufacturing. Prerequisite: ESC 22 or equivalent.

### **MER 210 a-b. Introduction to Case Studies Methods**

*Fall, Winter*

Open only to part-time graduate students.

### **MER 216. Finite Element Methods in Engineering**

*Spring E*

Introduction to the use of finite element methods in various engineering applications.

### **MER 228. Computer Based Control Systems**

*Winter E*

See EER 228.

### **MER 238. Fluid Dynamics of Turbomachinery**

*Fall E*

Analysis of the energy exchange between a continuously flowing fluid and a turbomachinery rotor. Study of the design and operating principles of axial- and radial-flow turbines, compressors, and pumps. Prerequisite: MER 33.

### **MER 252. Convection Heat Transfer**

*Winter E*

Analysis of laminar and turbulent heat transfer processes. Approximate solutions of the energy equation according to boundary layer theory. Prerequisites: MER 50, Math 101 or equivalent; MER 232/234 or permission of instructor.

### **MER 260. Nuclear Engineering and Technology I**

*Spring E*

Nuclear reactions and radiation; basic concepts and terminology used in reactor theory; radiation shielding; heat generation and transfer in nuclear reactors; study of reactor design variables with reference to existing designs. Prerequisites: MER 50, or permission of instructor.

**MER 290-291. Independent Study**

*Fall, Winter, Spring*

**MER 292a. Master’s Project**

*Fall, Winter*

The preparation and writing of an extensive report on a topic of interest between the student and a department faculty member. A single course presented over two terms; a grade will be given for two terms of work only. Enrollment recommended no earlier than the last year of study. See MER 292b.

**MER 292b. Master’s Project**

*Winter, Spring*

Continuation from MER 292a. Completed writing of the report and its oral presentation. Students must register for ME 292b even though they have previously registered for MER 292a. Open only to part-time graduate students.

**MER 296-298. Research and Thesis**

**(As arranged by department)**

**Graduate Management Institute**

**Location** . . . . . Lamont House  
**Telephone** . . . . . (518) 388-6238  
**Fax** . . . . . (518) 388-6754

**Director Graduate Management Institute:**

Sue Lehrman

**Director M.B.A.:** R. Alan Bowman

**Director M.B.A.–Health Systems Administration**

**Program:** Martin A. Strosberg

**Professors:** Arnold, Lambrinos, Schmee, Strosberg;

**Associate Professors:** Bowman, Lehrman, Nydegger;

**Assistant Professors:** Ashman, Neidermeyer;

**Clinical Assistant Professor:** DeSarkar;

**Affiliated Professors:** Sener, Yaisawarng

**Degrees Offered:**

- Master of Business Administration (M.B.A.)
- Master of Business Administration—Health Systems Administration (M.B.A.-H.S.A.)

**MISSION STATEMENT**

The mission of the Graduate Management Institute (GMI) of Union College is to provide outstanding master’s-level management education. GMI’s programs complement areas of undergraduate study at the College and are designed to meet the needs of Union undergraduates—as well as a diverse mix of other students—seeking graduate management education that builds on a strong liberal arts foundation and benefits from Union’s intimate environment. GMI imparts to graduates the critical thinking, communication, and other contemporary business skills necessary to meet immediate and long-term career goals, while instilling the desire and capacity for life-long learning. GMI is committed to faculty research and service that enriches the educational process and that links the faculty with the changing needs of the business, academic, and professional communities.

**AACSB–INTERNATIONAL ACCREDITATION**

Union’s MBA program is accredited by AACSB–International, the world’s leading business school-accrediting body. Union’s program is unique in being the smallest of all AACSB-accredited business programs and one of only 28 accredited programs—along with such institutions as Harvard University, Stanford University, and Dartmouth College—that focus solely on graduate degrees. Less than 30 percent of all business programs are accredited nationwide.

## FULL-TIME STUDY

To be considered for full-time matriculated student status, GMI applicants must hold a bachelor's degree and have submitted a complete application (including application essay), an official Graduate Management Admissions Test (GMAT) score, official copies of all undergraduate and graduate transcripts, and three letters of recommendation. Non-U.S. applicants who have not studied for at least two years in an English-speaking program must have submitted an official score from the Test of English as a Foreign Language (TOEFL). Once submitted, all application materials become the property of Union College and are not returnable.

Tuition is assessed on a per-course basis. A **non-refundable** deposit of \$250 is required upon acceptance to degree status in order to reserve a place in the entering full-time class. A portion of the deposit (\$150) is applied toward an annual, mandatory, student resource fee; the remaining portion of the deposit (\$100) is credited to the student account and applied toward future tuition charges.

Full-time students typically take two years to complete their MBAs. However, as described below, in some instances it is possible to complete the program at an accelerated rate.

The "Registration Procedures" section of this Bulletin provides further information on registration procedures and deadlines.

## PART-TIME STUDY

Part-time students may begin course work on a non-matriculated basis during any academic term. Students must hold a bachelor's degree and have an undergraduate grade point average of at least 2.7 on a 4.0 scale—or be reviewed by the GMI Admissions Committee—to begin course work as non-matriculいたes. Up to three Core GMI courses may be completed on a non-matriculated basis. Non-matriculated students may not take Advanced GMI courses. To take more than three courses, students must apply and be formally admitted to a GMI degree program.

To be considered for part-time matriculated student status, GMI applicants must hold a bachelor's degree and have submitted a complete application (including application essay), an official Graduate Management Admissions Test (GMAT) score, official copies of all undergraduate and graduate transcripts, and three letters of recommendation. Non-U.S. applicants who have not studied for at least two years in an English-speaking program must have submitted an official score from the Test of English as a Foreign Language (TOEFL). Once submitted, all application materials become the property of Union College and are not returnable.

Tuition is assessed on a per-course basis. Upon matriculation, part-time students are assessed a one-time resource fee of \$150. A part-time student taking three or more courses per term is considered full-time and must comply with all regulations governing full-time students.

Part-time students typically take four to five courses a year and complete the program in four years or less.

The "Registration Procedures" section of this *Bulletin* provides further information on registration procedures and deadlines.

## COURSE WAIVER/TRANSFER/REPLACEMENT POLICY

Students may be granted a **course waiver** for any core course based on undergraduate-level courses. Waivers reduce by one the total courses required. Students may be granted a **transfer** for any course (Core or Advanced) based upon completion of a comparable graduate-level course with a grade of B or better, provided that the course has not been used to earn another graduate degree. Transfers reduce by one the total courses required. Credits transfer in, but grades do not. Students may be granted a **replacement** for any course based on undergraduate-level courses and/or experience. Replacements do not reduce the total courses required.

A minimum of **12 courses** must be completed at GMI. In addition, for the M.B.A.–Health Systems Administration program only, the sum of courses taken at GMI plus transfers must total at least 18. If course waivers and transfers reduce the number of remaining courses below the minimum, students may take additional electives/designated replacement to reach the required minimum.

To facilitate schedule planning, students are encouraged to submit all waiver, transfer, and replacement requests to the Curriculum Board (c/o Rhonda Sheehan) as soon as possible. All requests must be submitted by the end of the first term (Fall, Winter, or Spring) during which the student takes a course as a matriculated student. Each request must be submitted on the appropriate form and accompanied, at minimum, by a copy of the transcript showing the relevant course(s). Students are encouraged to attach a catalog description, course syllabi and/or other materials that will help the Curriculum Board rule on the request(s). The Board may request such materials as well.

## **REQUIREMENTS FOR OBTAINING AN M.B.A. AFTER AN M.S.**

Students who received one of GMI's previously offered M.S. degrees may obtain an M.B.A. by taking **nine additional courses** beyond those taken to satisfy their M.S. degree requirement, assuming that all M.S. courses fit within the degree requirements of their desired M.B.A. program. To count toward the M.B.A., an M.S. course must have been completed within the past five years, and the students must have received a grade of at least a "B-".

## **The Management Program**

**Director:** R. Alan Bowman (518) 388-6297

### **M.B.A. Management Program Overview**

The M.B.A. Management program prepares students for analytical, managerial, and executive-level positions in a variety of enterprises. The design and delivery of the curriculum emphasize broad exposure to core business disciplines; the building of analytical, computer, communication, and human management skills; and the development of an ethical, systems-oriented, cross-functional perspective for decision-making.

### **M.B.A. Management Coursework**

As shown below, the M.B.A. program includes **10 required Core Courses and 10 Advanced Courses** (two required; eight elective). After waivers and transfers, a minimum of 12 courses must be completed at GMI. For more details, see the waiver policy above. At least one advanced-level course is required in each of the seven categories shown. Students must complete at least eight Core Courses before taking any Advanced Courses. Students must take all Core Courses (except GMI 270) within each category before taking an advanced course in that category. The capstone course (GMI 381) is typically the last course taken. Full-time students take Core Courses in their first year and Advanced Courses in their second year. **An internship or relevant business experience** is required for the degree. By taking up to four courses in a given category, students can create their own unique programmatic focus.

### **Finance**

M.B.A. Core Courses: GMI 210, 212

M.B.A. Advanced Required Courses: GMI 213, 214, 217, 218, 229, 261, 319

### **Economics and Environment**

M.B.A. Core Courses: GMI 220, 270

M.B.A. Advanced Required Courses: ECO 244, 251, 225, GMI 221

### **Marketing and Operations**

M.B.A. Core Courses: GMI 225, 231

M.B.A. Advanced Required Courses: GMI 226, 227, 232, 241, 263, 265, 282

### **Management Science**

M.B.A. Core Courses: GMI 201/2, 206

M.B.A. Advanced Required Courses: GMI 232, 241, 282

### **Management**

M.B.A. Core Course: GMI 251

M.B.A. Advanced Required Courses: GMI 245, 250, 252, 253, 257, 260

### **Global**

M.B.A. Core Course: GMI 200

M.B.A. Advanced Required Courses: GMI 260, 261, 262, 265, ECO 244

### **Capstone**

M.B.A. Core Courses: None

M.B.A. Advanced Required Courses: GMI 381

Students must take either GMI 217 or GMI 261, and GMI 381. Note that several courses can count in more than one category.

### **Completing the M.B.A. program in twelve months**

Students who waive at least six courses may be able to complete the M.B.A. program in one year by starting in the summer term. Four courses can be taken during the summer in two terms and twelve courses can be taken in the three terms during the regular academic year. Students interested in this option must meet with an academic advisor during the previous academic year.

## **The M.B.A.–Health Systems Administration Program**

**Director:** Martin Strosberg (518) 388-6299

### **M.B.A. Health Systems Administration Overview**

The M.B.A. in Health Systems Administration prepares graduates for careers as administrators and analysts in health care, governmental, and private sector organizations with strong health care interests. Typical organizations hiring health systems graduates include hospitals, clinics, health maintenance organizations, consulting firms, planning and regulatory agencies, and research firms. The curriculum is designed to help students understand the complexities of the health care system and to provide the skills necessary to allocate resources, execute programs, and manage health and health-related facilities more effectively.

## A.C.E.H.S.A. Accreditation

The M.B.A. in Health Systems Administration is accredited by the Accrediting Commission on Education for Health Service Administration (ACEHSA). The program has been continuously accredited since 1981 and was most recently re-accredited in 2000. The MBA in Health Systems Administration program is one of only 21 programs nationwide—including institutions such as the University of California at Berkeley, Duke University, and Boston University—that are dually accredited by both ACEHSA and AACSB.

## M.B.A. – Health Systems Administration Coursework

As shown below, the M.B.A.–Health Systems Administration program includes **10 required Core Courses and 10 Advanced Courses** (seven required; three elective). Note that at least two electives must be GMI (versus HSS) courses. The sum of courses taken at GMI plus transfers must total at least 18. If course waivers and transfers reduce the number of remaining courses below the minimum, students may take additional electives to reach the required minimum. For more details, see the waiver policy above. Students must complete at least eight of the Core Courses before taking any Advanced Course. Students must take all Core Courses within each category before taking an advanced course in that category. The capstone course (HSS 381) is typically the last course taken. Full-time students take Core Courses in their first year and Advanced Courses in their second year. **An internship or relevant business experience** is required for the degree.

### Finance

M.B.A.–H.S.A. Core Courses: GMI 210, 212  
M.B.A.–H.S.A. Advanced Required Courses: HSS 217

### Economics

M.B.A.–H.S.A. Core Courses: GMI 220  
M.B.A.–H.S.A. Advanced Required Courses: HSS 220

### Marketing and Operations

M.B.A.–H.S.A. Core Courses: GMI 225, 231  
M.B.A.–H.S.A. Advanced Required Courses: HSS 225

### Management Science

M.B.A.–H.S.A. Core Courses: GMI 201/2, 206  
M.B.A.–H.S.A. Advanced Required Courses: None

### Management

M.B.A.–H.S.A. Core Courses: GMI 200, HSS 201  
M.B.A.–H.S.A. Advanced Required Courses: HSS 250

### Health Environment

M.B.A.–H.S.A. Core Courses: HSS 200  
M.B.A.–H.S.A. Advanced Required Courses: HSS 274, 280

### Capstone

M.B.A.–H.S.A. Core Courses: None  
M.B.A.–H.S.A. Advanced Required Courses: HSS 381

## Joint Degree and Other Programs

### Accelerated B.A. or B.S. and M.B.A. Program

Union undergraduate students considering entrance into the accelerated bachelor's/M.B.A. program should consult with an M.B.A. program advisor and apply for admission during the sophomore, junior, or first term of the senior year. Joint degree students must complete twenty graduate courses, three of which may count toward bachelor's degree requirements. Graduate courses may not be taken until the junior year and are typically completed during the senior and fifth years.

### Four-Year J.D./M.B.A. Program

This program is designed to meet the management development needs of students enrolled at the Albany Law School. Students spend one year in law studies, one year in management studies, and two years in law and management studies. Some overlap of degree credit has been approved for this program.

### Certificate Programs in Health Systems and Finance

These programs—which include six courses—are designed for individuals who already have a graduate degree but would like to expand their expertise in either health care or finance. The curriculum is tailored to the needs of each student.

- Application front page
- Application fee
- All college transcripts
- Interview required
- Graduate testing results, if taken

## Graduate Management Institute Courses

### KEY TO TERMINOLOGY

#### Time of Course Offering:

D (Day) LA (Late Afternoon) E (Evening)

\* = Advanced MBA or MBA-HSA Course

#### Prerequisite Discussion and Terminology:

**“Pre” = Prerequisite.** Student must have finished this course prior to beginning the listed course.

**“Rec” = Recommended.** It is recommended (but not required) that this course be completed prior to the course listed.

If “prerequisites” have not been fulfilled, then written permission forms, signed by the instructor or GMI Director, must accompany the registration form.

Students must take 80% of all Core Courses, including GMI 201/202 and GMI 206, prior to taking any Advanced Course.

With the exception of GMI 270, students must take all Core Courses in each subject category prior to taking any Advanced Course in that category. Health students must take HSS 200 and HSS 201 before taking any Advanced Course.

Additional prerequisite requirements are listed below.

### CROSS-LISTED COURSES

#### ECO 225. Efficient Management of Technology\*

*Spring D; Yaisawarng*

Economic models of the firm; production and cost functions; concepts of efficiency and efficiency measurement; factors affecting efficiency; empirical applications to specific industries. Pre: ECO 41 and ECO 43—or permission of instructor.

#### ECO 244. International Economics\*

*Fall D; Sener*

Foreign trade and international finance, protectionism, international migration of capital and labor, political economy of trade policy, strategic trade policy, international coordination of macroeconomic policies. Familiarity with fundamental concepts of microeconomics, macroeconomics, and regression analysis is expected. If uncertain about the adequacy of prior course work, the instructor should be consulted prior to registration. Pre: ECO 41, ECO 42, and ECO 43—or permission of instructor.

#### ECO 251. Monetary Economics\*

*Winter D; staff*

The nature and role of money, banking and the Federal Reserve System, the impact of monetary policy on economic activity, international monetary relations and institutions. Pre: ECO 41, ECO 42, and ECO 43—or permission of instructor.

#### PHL 274. Biomedical Ethics

*Fall E, Spring LA; Baker*

A philosophical examination of moral problems in biomedicine, in particular those relating to physicians and patients, researchers and subjects, birth and death.

### GMI COURSES

#### GMI 200. Managing Ethically in a Global Environment

*Fall D, Winter E, Spring E; Manna*

This course examines issues of team functioning, ethics, and managing differences, all in an increasingly global business environment. Students work individually and in groups to improve written and verbal communication skills.

#### GMI 201 (Half Course). Mathematics of Management

*Fall E, Winter D; Bowman*

This course focuses on mathematics useful in modeling management processes. Fundamental concepts of differential and integral calculus and their applications to management are addressed. Students must register separately for GMI 201 and GMI 202.

#### GMI 202 (Half Course). Introduction to Probability

*Fall E, Winter D; Bowman*

This course covers marginal, joint and conditional probability; random variables, expected value and variance; selected probability distributions and their uses in management; and sampling distributions and the Central Limit Theorem. Students must register separately for GMI 201 and GMI 202. Pre: GMI 201.

#### GMI 206. Statistical Models for Management

*Winter E, Spring LA; Schmee, Staff*

This course emphasizes statistical approaches (confidence intervals, hypothesis testing, regression analysis, chi-square tables) that support managerial decision making. Examples of such decisions include determining the best of several suppliers or appropriate salary levels based on education and required skill. Examples from quality management, such as capability analysis and control charting will also be included. Emphasis will be placed on problem statement formation, translation of problem statements into quantitative terms, and finding appropriate data to reach supportable conclusions. Analysis will be performed using statistical and other software. Pre: GMI 201/2 or a qualified course in probability or statistics.

**GMI 210. Financial Accounting**

*Fall D, E, Winter E, Spring E; Arnold and Neidermeyer*  
A study of the accounting cycle, including preparation and analysis of income statement and balance sheets, price level problems, ratio analysis, and funds flow-cash flow; a critical study of generally-accepted accounting principles.

**GMI 212. Managerial Accounting and Finance**

*Winter D, E, Spring E; Neidermeyer*  
An introduction to the tools and techniques of financial analysis and decision making. Topics covered include financial statement analysis, cost classification and behavior, cost-volume-profit analysis, incremental cost analysis, time value of money, capital budgeting, risk and return, capital structure and the cost of capital, and financial planning. Spreadsheet programs are used extensively in this course. Pre: GMI 210.

**GMI 213. Income Tax Accounting\***

*Not offered in 2001-2002*  
Aspects of tax accounting and planning for the individual taxpayer. Topics include the individual tax formula, gains and losses, rental property aspects of sole proprietorship taxes and tax research. Projects are used to achieve course objectives.

**GMI 214. Advanced Concepts of Financial Reporting I \***

*Fall E; Arnold*  
An analysis and critique of generally accepted accounting principles (G.A.A.P.) currently used in publicly reported financial statements. Emphasis is placed on understanding and critiquing advanced G.A.A.P. topics. Problem application cases and outside readings are utilized. Pre: GMI 210, GMI 212.

**ACC 283. Accounting Internship (No Fee)**

*Winter*

**GMI 216. Security Analysis \***

*Not offered in 2001-2002*  
An introduction to the institutional structure and practice of the securities industry, and an analysis of key features and valuation techniques for stocks, bonds, convertibles, options, futures, commodities, and mutual funds.

**GMI 217. Advanced Corporate Finance \***

*Fall E, Spring E; Ashman*  
This course covers advanced topics in corporate financial management. The analytical skills necessary to evaluate complex financial problems are developed through case studies. Topics covered include: advanced capital budgeting, agency theory, option theory and applications, measuring and hedging financial risk, merger, and acquisition analysis, corporate financial analysis and planning models, and short-term financial management.

**GMI 218. Cost Accounting \***

*Spring E; Neidermeyer*  
The course covers specific aspects of managerial accounting concerned with the accumulation and allocation of costs. While the major emphasis is on manufacturing industries, other situations are also covered. Topics include process and job order costing, controlling materials, labor and overhead costs, and developing standard costs and analyzing variances.

**GMI 220. Business Economics**

*Fall E, Winter LA; Lambrinos*  
This course covers the basic microeconomic model of price determination; the impact of market structure on price and output decisions by firms; the role of the public sector in an economy; the basic macroeconomic model of national income determination; the impact of fiscal and monetary policies on employment levels, price stability and economic growth; and international economic relationships.

**GMI 221. Managerial Economics \***

*Winter E; Staff*  
The course applies principles of micro-economic theory to managerial decision making. Micro topics include demand theory, estimation and forecasting, production and cost theory, estimation, market structure, forecasting with econometric, time series and exponential smoothing models. Other topics include the role of government in decision making, risk analysis, and pricing practice.

**GMI 223. Labor Economics \***

*Not offered in 2001-2002*  
This course considers the theoretical foundations of labor demand and labor supply. The course also covers wage and employment discrimination, compensating wage differentials, disability and worker safety, workers compensation, impact of trade unions, and the impact of the global economy on wages.

**GMI 225. Marketing Management and Strategy**

*Fall E, Spring LA; Barth*  
This course presents readings and case studies in strategic market planning, a discussion of the product life cycle, marketing mix, product policy, pricing strategies, channels of distribution, promotion, international marketing, and marketing organization with special emphasis on long-term implications.

**GMI 226. Marketing Research Techniques \***

*Not offered in 2001/2002*  
The objective of this course is to provide comprehensive exposure to marketing research methods. The course is designed for the manager with ultimate responsibility for identifying the scope of and implementing particular market research activities. The course explores the application of scientific investigation to the identification and solution of marketing problems.

**GMI 227. Industrial Marketing \***

*Winter E; Barth*

This course examines the process of product development from the stage of market identification through rollout of the new product. Subjects considered include: market research techniques, using primary and secondary data, idea generation, designing for quality, marketing strategy and launch. The primary focus will be on products to service the industrial or business market, but techniques from consumer marketing will be incorporated.

**GMI 229. Money, Markets and Banking \***

*Fall E; Ashman*

The course covers the nature and functions of money and finance in the economy. Commercial and central banking, monetary theory, and monetary policy are also considered. Rec: GMI 217.

**GMI 231. Operations Management**

*Fall LA, Winter D, Spring E; Bowman*

This course covers Six Sigma quality concepts and tools, capacity planning, facility location, and inventory management, with an emphasis on supply chain design and management. Management science tools are used throughout.

**GMI 232. Quality Systems Management \***

*Winter E; Schmee*

The course looks at quality improvement approaches in the context of overall organizational objectives. The course discusses the contents and impact of important government and industry standards such as ISO 9000. The course covers Six Sigma including the Measure-Analyze-Improve-Control model (MAIC) and Design for Six Sigma (DFSS). It discusses extensions to benchmarking and quality functional deployment and offers advanced tools such as systems reliability and maintainability, and life data analysis.

**GMI 233. Quality Control \***

*Not offered in 2001-2002*

Probability plots; formal test design for continuous and discrete variables; process mean control charts; operating characteristics for all tests; lot rectification—AOQ and ATI; minimum-cost plans; process variance control; tolerance limits, parametric and non-parametric; double and sequential sampling; sub-lot testing; Analysis of Means; Bulk Sampling; CSP-I plans, with AFI; Mil. Standards.

**GMI 234. Inventory Management \***

*Not offered in 2001-2002*

Introduction to the management of inventory systems. Topics range from single-item, single-facility systems to large-scale, multi-item, multi-facility systems. Deterministic and probabilistic models are introduced and used as a basis for analysis. Emphasis is placed on understanding and using operations research models.

**GMI 235. Project Management and Design of Experiments \***

*Not offered in 2001-2002*

This course covers two separate topics: project management and design of experiments. Project management considers the fundamentals for successfully managing individual or multiple projects. Topics covered include planning, scheduling, budgeting, resource leveling, monitoring, and control. Development of mathematical software, administrative, and human management skills necessary for increasing productivity and successfully completing projects on time and within budget are also addressed. Design of experiments addresses topics like underspecified and overspecified models, experimental design (including complete and incomplete block designs), factorial designs, fractional factorial designs, and response surface designs, classical analysis of variance and its relationship to regression analysis, simultaneous inference, randomization and practical constraints, random effect and mixed models, and nested and split plot data arrangements.

**GMI 236. Industrial Management Systems \***

*Not offered in 2001-2002*

A series of related cases are analyzed in an experiential learning environment that develops and integrates the topics of transportation, warehousing, distribution, inventory management, manufacturing, production planning, scheduling and control. The course objective is to learn how to develop and implement market-driven strategies for transforming an organization's industrial management systems to enable it to become a world-class competitor.

**GMI 241. Systems Analysis and Simulation \***

*Fall E; Bowman*

In this course students build and utilize computer simulation models to analyze a wide range of systems. Applications include restaurants, doctors' offices, customer call centers, and many others. Both dynamic and static simulation software and tools are discussed and utilized.

**GMI 245. Management for Information Systems \***

*Winter E; Staff*

The course considers the use of management information systems within the organization, specifically addressing what an information system is, the underlying technologies, and how current and future computing and telecommunications technologies will contribute to the daily operation and competitiveness of the organization. Particular emphasis is placed on use of information systems to gain competitive advantage.

**GMI 250. Competing by Design \***

*Spring E; Belasen*

Design often signals a shift in strategic emphasis and patterns of organizational performance. Design can also be used to shape an organization's tone or operating style. Dramatic and lasting restructuring or reengineering plans often fail without the mindset of change architects who share the new strategic vision and corporate values. The ultimate goal of design is to use organizational structures, systems, and processes creatively as a sustainable source of competitive advantage. This course focuses on examining how successful corporations leverage competitive advantages through restructuring and external alliances. Students will apply theoretical knowledge and conceptual models to analyze organizational structures, diagnose organizational design, and evaluate a range of design options and implementation strategies available for transitioning organizations. Topics include corporate downsizing, strategic control systems, horizontal structures, outsourcing, partnerships, virtual forms, and global design.

**GMI 251. Managing People and Teams in Organizations**

*Winter LA, Spring E; Nydegger*

This course approaches management issues from the "human" side. By relying on text materials related to basic theory and research in management, and by integrating activities and "hands-on" learning opportunities, students have a broad range of techniques that equip them to function as effective managers in modern organizations. Particular emphasis is given to skills and activities associated with Total Quality Management.

**GMI 252. High Performance Leadership: A Competency Approach \***

*Fall E; Belasen*

This course emphasizes cognitive skills and experiential/practicum learning applied to ongoing leadership and organizational problems. Students learn about leadership roles and competencies essential for building and supporting organizational capabilities and business strategies in global markets. The course also enables students to learn a method to diagnose their strengths and weaknesses in leadership capacities and measure their proficiencies against benchmarked models of high performance leadership.

**GMI 253. Organizational Development and Transformation \***

*Fall E, Nydegger*

This course considers the theory and practice of planned organizational change. Students are exposed to a variety of intervention techniques applicable in a wide range of organizational settings. Lectures are complemented with participatory exercises and interactive discussions.

**GMI 254. Labor Relations \***

*Not offered in 2001-2002*

Analysis and evaluation of the policies, procedures, theories, and problems of labor unions and employers, including origins of craft, industrial, and public employee unions, as well as practices peculiar to each.

**GMI 255. Seminar in Computer Management Systems**

*Not offered in 2001-2002.*

The course addresses management issues such as job satisfaction and motivation, leadership, communication, evaluation, and feedback. These topics are presented from the point of view of computer management systems, and in the context of situations and tasks relevant to the computer science management professional.

**GMI 257. Human Resources Management \***

*Fall E; Paludi*

An introduction to the theory and practice of human resource management, this course examines the economic, political, legal, and managerial aspects of the recruitment and selection, retrenchment, performance evaluation, compensation, motivation, job design, organizational change, and labor relations functions. The focus of the course includes profit, non-profit, and governmental organizations with particular emphasis on health care delivery firms.

**GMI 260. Executive Decision Processes in Global Environments \***

*Not offered in 2001-2002*

Along with information technology, international management is the major challenge facing organizations in the hypercompetitive global marketplace. Companies that once served a specific geographic area or serviced a specific need have learned to compete with Anybody, Anywhere, Anytime. Needing to diversify in order to compete effectively, an increasing number of multinational companies are finding it essential to anticipate changes and innovate continually to become world-class organizations. Global management requires visionary leaders and strategic thinkers who are driven by a customer focus and continuous improvement, supported by a fluid virtual organization and sustained by creative human capital and extensive information technology. These leaders must also recognize the existence of cognitive barriers to decision making and how to overcome decision traps and make better choices for their multinational companies. Using Internet-based search engines, cases, and small group projects, students will have hands-on experiences and acquire the skills necessary to become successful decision makers for their multinational companies.

**GMI 261. International Finance \***

*Winter E; Ashman*

An analysis of international financial markets and the special problems and opportunities associated with the financial management of multinational firms. The international monetary and banking system, balance of payments, and economic parity relationships are also examined. Foreign exchange risk management, international financing activities, multinational capital budgeting, political risk, international taxation issues and diversity of financial reporting are considered. Rec: ECO 244.

**GMI 262. International Business and Competitive Theory\***

*Spring E; Chudzik*

This course examines international business management as influenced by the important economic, political and cultural environment within which businesses must conduct international trade and investment. The problems and issues confronting international managers are evaluated related to a firm's strategy, organizational structure, manufacturing, material management, marketing, R&D, human resources and finance. Competitive strategies are examined that have been successful in leading international companies. Case studies are used extensively to illustrate the relevance of these topics in the practice of international business.

**GMI 263. e-Commerce \***

*Winter E; Chudzik*

This course provides exposure to important ideas, companies and technology in the Internet environment. Case studies in e-business are used extensively.

**GMI 265. International Marketing Management\***

*Spring E; Staff*

This course examines development of international marketing strategies, from determining objectives and evaluating international market opportunities through coordinating strategies in world markets. Particular emphasis is placed on application of marketing principles in the multinational environment.

**GMI 270. Legal Principles of Business**

*Fall E; Staff*

The objectives of the course are to enable the business manager to identify situations with legal implications and to interact effectively with professional legal counsel. Particular areas of the law examined during the course are contracts, sales, negotiable instruments, negligence, product liability, secured transactions, and ethical considerations. Not open to JD/M.B.A. students.

**GMI 271. Legal and Tax Aspects of Partnerships and Corporations**

*Winter E; Staff*

This course addresses the legal and tax issues posed by the formation, operation, dissolution, and termination of partnerships and corporations as well as the tax reporting requirements of each business enterprise. Case studies are used to achieve course objectives. Pre: GMI 210, GMI 213; Co-req: GMI 270.

**GMI 282. Lean Production Management \***

*Spring E; Bowman*

This course covers just-in-time and lean production concepts and tools, process technology, facility layout, design for manufacturing, production scheduling, designing and managing global supply chains.

**GMI 283. Management Internship (No Fee)**

*Fall, Winter, Spring, Summer*

**GMI 284. International Management Internship (No Fee)**

*Fall, Winter, Spring, Summer*

**GMI 290, 291. Independent Study in Accounting****GMI 292, 293. Independent Study in Finance/Economics****GMI 294, 295. Independent Study in Management Systems****GMI 314. Advanced Concepts of Financial Reporting II**

*Spring E; Arnold*

Continuation of material from GMI 214 (See GMI 214 course description for additional information). Pre: GMI 210; Rec: GMI 212, GMI 214.

**GMI 315. Topics in Finance: Venture Capital to Mergers and Acquisitions\***

*Not offered in 2001-2002*

This course traces the expectations of investors and the financing and management decisions of firms from the inception of new ventures through public ownership to possible LBO or merger. Emphasis is placed on risk and reward, the role of various classes of investors, and management's responsibilities to its constituencies.

**GMI 316. Special Topics in Accounting**

*Winter E; Arnold*

This course provides an analysis and critique of specialized topics of current concern in financial accounting. Topics build upon subject areas presented in prior financial accounting courses and is focused on subject areas of current relevance including business combinations, consolidations, not-for-profits, and partnerships. Pre: GMI 210, GMI 214; Rec: GMI 212, GMI 314.

### **GMI 318. Principles of Auditing**

*Spring E; Nealon*

This course provides an introduction to the theory and application of auditing practices. There is a balance between auditing techniques and the underlying rationale associated with the techniques. Topics include risk analysis, design of audit programs, audit techniques, and current professional pronouncements. Pre: GMI 210, GMI 214; Rec: GMI 212, GMI 213, GMI 314.

### **GMI 319. Investments\***

*Spring E; Staff*

This course provides an in-depth analysis of modern investment analysis and portfolio management techniques. Current theory, empirical evidence, and institutional practices are considered. Topics covered include portfolio theory and asset pricing models, market efficiency, fixed-income portfolio management and immunization, equity valuation models, the valuation of options, futures and other derivative securities, portfolio management and performance evaluation, and international diversification. Rec: GMI 217.

### **GMI 381. Strategic Planning and Policy\***

*Winter E, Spring E; Chudzik and Schmee*

This course addresses the integration and practical applications of quantitative and qualitative methods to management problems and policy formulation in the public and private sectors. The course strives to integrate all prior core courses. Students must have three or fewer courses left to complete after taking GMI 381. Students may not receive credit for both GMI 382 and GMI 381.

### **GMI 382. Business and Marketing Policy\***

*Not offered in 2001-2002*

This course addresses the principles of marketing and distribution systems and the integration of these principles, along with those of the other business disciplines, in the interest of formulating thoughtful strategic planning and policy development. Students may not receive credit for both GMI 382 and GMI 381.

## **HEALTH SYSTEMS**

### **HSS 200. Introduction to Health Systems**

*Winter E; Strosberg*

This course examines the determinants of health, illness, and medical care utilization, institutional arrangements and settings for the delivery of acute and chronic care, the doctor-patient relationship, resource allocation and financing, and measuring and evaluating system performance.

### **HSS 201. Health Systems Management**

*Spring E; Nydegger*

This course examines managerial roles and processes within health service organizations—organization design, managerial epidemiology, governance, total quality management, human resource management, labor relations, and ethics. Pre: HSS 200.

### **HSS 202. Medical Aspects of Health Care Administration\***

*Not offered in 2001-2002*

This course is designed for students with little or no formal education in human physiology. Course objectives include providing a basis for enhanced communication with health professionals, achieving a general understanding of basic biologic organization and function of the healthy individual, introducing issues of patient education, disease management, physician incentives, physician and health plan report cards, and using real patient episodes to illustrate the principles of managed care.

### **HSS 205. Method and Measurement in Health Services Research\***

*Not offered in 2001-2002*

This course provides a description of the major principles, concepts, and current methodologies in evaluation research, social epidemiology, organization, and social research. The course makes extensive use of current cases and health services research findings.

### **HSS 217. Health Care Finance\***

*Spring E; Ashman*

This course covers financial management in a regulated health care environment. Topics include cost-finding and third-party reimbursement, contemporary issues in health care financing, sources of capital, capital budgeting, financial planning and analysis, cost accounting, and managed care issues.

### **HSS 220. Health Economics\***

*Winter E; Lambrinos*

This course is intended for students entering the health field and investigates economic approaches to problems and solutions. Students obtain an understanding of how economics contributes to public and private decision-making in health care, and learn to properly interpret economic research results and apply them to work performed by health planners and administrators. Rec: GMI 210, GMI 212.

**HSS 225. Health Systems Marketing and Managerial Epidemiology\***

*Fall E; Manna and Stephens*

This course covers two main topical areas. The first builds on GMI 225, Marketing Management and Strategy, focusing specifically on the unique challenges and approaches associated with healthcare marketing. Consumer behavior, the development of the marketing mix, product policy, business-to-business marketing, and market strategy appropriate to specific situations of various health care institutions are addressed. The second focus is on understanding and applying basic epidemiological methodologies to the health care management arena.

**HSS 250. Structural Dynamics in Health Care Systems**

*Fall E; Stosberg*

Application of organization theory to health care organizations and systems for the purpose of improving performance. Topics include: organizational structure and design, coordination and control, power and politics, organizational culture, organizational ethics, organizational change.

**HSS 256. Group Practice Administration: Seminar and Practicum\***

*Winter E; Kleinbauer*

The objective of this course is to introduce students to the organization and management of private group practice through seminar and practical experience. It is intended that this course will prepare students for employment in private group practices and/or other ambulatory care organizations.

**HSS 258. Issues and Management of Long-Term Care\***

*Not offered in 2000-2001*

This course examines the organization and management of nursing facilities, retirement communities, assisted living facilities, and organizations for other populations requiring long-term specialty treatment. Emphasis is placed on the personal and professional skills necessary to provide a range of services and quality care within these dynamic environments.

**HSS 274. Legal Aspects of Health Care\***

*Spring E; Staff*

This course is designed to familiarize students with basic legal issues involved in managing health care systems. Antitrust, consent, labor law, malpractice, professional rights and other problems are explored using actual and hypothetical case studies. Not open to JD/M.B.A. students.

**HSS 280. Health Policy and Information Systems\***

*Winter E; Manna and Smith*

This course covers two main topics. The first (focusing on public policy formulation and implementation) is designed to provide an understanding of the political and regulatory environment of health care organizations. The second focuses on the role of information systems in the management and operation of health services organizations and how data derived from these systems can be utilized to assess and improve the health of defined populations.

**HSR 283. Health Residency Internship (No Fee)**

*Summer*

**HSS 290-295. Independent Study in Health Systems**

Students pursue programs of independent study in a particular area of health systems under the supervision of a faculty member. Written permission of the instructor is required.

**HSS 381. Strategic Issues for Health Care Organizations\***

*Spring E; Manna and Smith*

This course is designed to integrate the concepts and skills associated with managerial problem-solving learned throughout the M.B.A. in Health Systems Administration program. Students analyze case studies addressing the strategic realignment of health service organizations in today's turbulent environment. A variety of expert practitioners present their views on this topic. Students must have three or fewer courses left to complete after taking HSS 381.

**STATISTICS**

**STA 201. Introduction to Probability and Statistics**

*Winter D; Bowman*

This course studies the fundamentals of applied probability, most important distributions, acceptance sampling, confidence intervals, point estimation, and tests of hypotheses.

**STA 290-295. Independent Study in Statistics**

## Administration and Faculty

### ADMINISTRATION

**Roger H. Hull**, President; A.B. 1964, Dartmouth College; LL.B. 1967, Yale Law School; LL.M. 1972, J.D. 1974, University of Virginia

**Christina E. Sorum**, Vice President for Academic Affairs/Dean of the Faculty and Frank Bailey Professor of Classics; B.A. 1967, Wellesley College; Ph.D. 1975, Brown University

**Patrick F. Allen**, Director of Educational Studies; B.A. 1963, University of California; M.A. 1967, Ph.D. 1974, Indiana University

**Robert T. Balmer**, Dean of Engineering; B.S.E. 1961, University of Michigan; B.S.E. 1964, University of Michigan; M.S.E. 1963, S.C.D. 1968, University of Virginia

**Susan Lehrman**, Director of the Graduate Management Institute; B.A. 1972, Oregon State University; M.P.H. 1980, Ph.D. 1993, University of California, Berkeley

### FACULTY

**Patrick F. Allen**, Director of Educational Studies; B.A. 1963, University of California; M.A. 1967, Ph.D. 1974, Indiana University

**Linda G. Almstead**, Lecturer, Computer Science; B.A. 1970, Rensselaer Polytechnic Institute; M.S. 1985, Union College

**Ann M. Anderson**, Associate Professor and Chair of Mechanical Engineering; B.S. 1984, Tufts University; M.S. 1985, Ph.D. 1990, Stanford University

**Donald F. Arnold**, Professor of Management; B.S. 1966, State University of New York at Albany; M.B.A. 1968, Ph.D. 1972, State University of New York at Buffalo

**Thomas D. Ashman**, Assistant Professor of Management; B.A. 1972, Williams College; M.B.A. 1989, Loyola College in Maryland; Ph.D. 1998, State University of New York at Buffalo

**Robert B. Baker**, Professor of Philosophy; B.A. 1959, City College of New York; Ph.D. 1967, University of Minnesota

**Robert Barth**, Adjunct Associate Professor of Management; B.S. University of Florida, M.B.A. Oklahoma City University

**Alan T. Belasen**, Adjunct Associate Professor of Management; B.A. 1979, M.P.A. 1981, Hebrew University of Jerusalem; Ph.D. 1987, State University of New York at Albany

**Ken Blom**, Adjunct Associate Professor of Educational Studies; B.S. 1968, Ph.D. 1988, State University of New York at Albany

**R. Alan Bowman**, Associate Professor of Management; B.S. 1980, M.B.A. 1986, Arizona State University; M.S. 1989, Ph.D. 1990, Cornell University

**Ronald B. Bucinell**, Associate Professor of Mechanical Engineering; B.S. 1981, Rochester Institute of Technology; M.S. 1983, Ph.D. 1987, Drexel University

**Yu Chang**, Professor of Electrical Engineering and Computer Science; B.S. 1961, Cheng Kung University; M.S. 1971, University of Wisconsin; Ph.D. 1974, Syracuse University

**Melvin W. Chudzik**, Adjunct Associate Professor of Management; B.S.E.E. 1957, University of Buffalo; M.S. 1970, Long Island University

**Thomas Della Sala**, Adjunct Associate Professor of Educational Studies; B.A. 1971, University of Pittsburgh; M.A. 1973, State University of New York at Albany

**Necip Doganaksoy**, Adjunct Professor of Management; B.S. 1983, M.B.A. 1985, Middle East Technical University; M.S. 1987, Ph.D. 1989 Union College

**Vuk Fatic**, Professor of Electrical Engineering/Computer Science; Dipl. Ing. 1960, Belgrade University; M.S. 1973, Ph.D. 1976, Virginia Polytechnic Institute and State University

**Chris S.T. Fernandes**, Assistant Professor of Computer Science; B.A. 1991, M.S. 1993, Ph.D. 2000, Northwestern University

**Jagdish T. Gajjar**, Professor of Electrical Engineering and Computer Science; B.E. in Elec. 1960, B.E. in Mech. 1961, Bombay University; M.E. 1963, University of Oklahoma; Ph.D. 1970, University of Houston

**Vic Greco**, Adjunct Associate Professor of Educational Studies; B.A. 1975, M.S. 1978, M.Ed. 1979, Ph.D. 1985, State University of New York at Albany

**Beatrice Hall**, Assistant Director of Educational Studies; B.A. 1973, State University of New York; M.A. 1983, University of Massachusetts

**Jill E. Hanifan**, Adjunct Assistant Professor of Educational Studies; B.A. 1977, M.A. 1979, State University of New York at Fredonia; D.A. 1987, State University of New York at Albany

**David G. Hannay**, Professor of Electrical Engineering and Computer Science; B.S. 1966, Wheaton College; M.A. 1967, State University of New York at Stony Brook; M.S. 1970, State University of New York at Albany; Ph.D. 1973, Rensselaer Polytechnic Institute

**Ekram I. Hassib**, Associate Professor and Chair of Electrical Engineering and Computer Science; B.S. 1964, Cairo University; M.A. 1968, Al-Azhar University, Cairo; Ph.D. 1971, Warsaw Polytechnics Institute.

**David Hemmendinger**, Associate Professor and Chair of Computer Science; B.A. 1962, Harvard University; M.S. 1963, Stanford University; M.A. 1966, Ph.D. 1973, Yale University; M.S. 1982, Wright State University

**Liva Herz Jacoby**, Associate Professor, Center for Medical Ethics, AMC. M.P.H. 1974, University of Pittsburgh; Ph.D. 1983, University of Pittsburgh

**Irene Jovell**, Adjunct Professor of Educational Studies; B.S. 1971, Russell Sage College; M.S. 1975, State University of New York at Albany

**John E. Kaplan**, Professor of Cardiovascular Sciences, AMC; B.S. 1972, University of Illinois; Ph.D. 1976, Albany Medical College

**William D. Keat**, Assistant Professor of Mechanical Engineering; B.S. 1976, M.S. 1983, Worcester Polytechnic Institute; Ph.D. 1989, Massachusetts Institute of Technology.

**Timothy Keeley**, Lab Instructor—Educational Studies; B.A. 1971, M.A. 1975, State University of New York at Albany

**Patricia Kennedy**, Adjunct Associate Professor of Educational Studies Program; A.B., State University of New York at Albany; M.S. 1980, College of St. Rose

**Robert Kleinbauer**, B.P.S. State University of New York College of Technology; M.B.A., Rensselaer Polytechnic Institute; Post Graduate, State University of New York

**Nicholas Krouglicof**, Assistant Professor of Mechanical Engineering; B.Eng. ME 1979, Ph.D. 1991, Concordia University

**James Lambrinos**, Professor of Management; B.A. 1975, Fairleigh Dickinson University; M.A. 1977, Ph.D. 1979, Rutgers University

**Susan Lehrman**, Director of Graduate Management Institute, Associate Professor of Management; B.A. 1972, Oregon State University; M.P.H. 1980, Ph.D. 1993, University of California, Berkeley

**James MacLain**, Adjunct Assistant Professor of Management; B.S. 1995 Rensselaer Polytechnic Institute

**Valerie Manna**, Visiting Assistant Professor of Management; B.S. 1989, Rensselaer Polytechnic Institute; M.B.A. 1991, Rensselaer Polytechnic Institute; Ph.D. 1997, Rensselaer Polytechnic Institute

**Victoria Martinez**, Associate Professor of Spanish, Chair of Modern Languages, and Associate Professor of Educational Studies; B.A. 1971, M.A. 1986, University of Kentucky; Ph.D. 1992, Arizona State University

**Frank F. Milillo**, Thomas J. Watson, Sr. and Emma Watson-Day Professor of Mechanical Engineering; B.S. 1966, M.S. 1968, Ph.D. 1974, Polytechnic Institute of Brooklyn

**Daniel Moriarty**, Professor, B.S.F.S. 1964, Georgetown University, J.D. 1967, Georgetown University.

**William J. Nealon**, Adjunct Associate Professor of Management; B.A. 1968, Siena College; M.B.A. 1980, Rensselaer Polytechnic Institute

**Presha E. Neidermeyer**, Assistant Professor of Management; B.S. and B.A. 1990, West Virginia University; M.Ac. 1991, Miami University; C.P.A., Ph.D. 1997, Virginia Commonwealth University

**Rudy V. Nydegger**, Associate Professor of Management; B.A. 1966, M.A. 1969, Wichita State University; Ph.D. 1970, Washington University

**Jane E. Oppenlander**, Adjunct Associate Professor of Management; B.S. and B.A. 1979, M.S. 1981, University of Vermont, Ph.D. 1986 Union College

**Sheila Otto**, Nurse Ethicist & Instructor, AMC. B.A. 1969, Trinity College; A.S.N. 1985 Maria College; B.S.N. 1989, University of New York; M.A. 1998, Empire State College

**Michele Paludi**, Adjunct Professor of Management; B.S. 1976, Union College; M.A. 1978, Ph.D. 1980, University of Cincinnati

**Martin L. Pollack**, Adjunct Associate Professor of Mechanical Engineering; B.S. 1972, M.S. 1973, Ph.D. 1975, Polytechnic Institute of Brooklyn

**David Pratt**, Associate Professor, ALS. B.A. in Jurisprudence. 1970, Oxford University;

**Matthew Rafferty**, Visiting Assistant Professor of Economics; B.A. 1992, College of William and Mary; M.A. 1995, Ph.D. 1997, University of California at Davis

**Philip Reynolds**, Adjunct Associate Professor of Educational Studies; B.S. 1960, Cornell University; M.A. 1969, Colgate University; Ed.D. 1973, University of Rochester

**Richard Reynolds**, Adjunct Associate Professor of Educational Studies; B.A. 1972, M.S. 1975, State University of New York at Oneonta.

**Kathleen Roman**, Adjunct Assistant Professor of Educational Studies, Adjunct Assistant Professor of Biology; B.S. 1973, State University of New York at Oneonta; M.S. 1991, Union College

**Philip Rosenberg**, Adjunct Associate Professor of Management; B.S. 1982, Cornell University, J.D. 1986, Yeshiva University, Benjamin N. Cardozo School of Law

**Michael Rudko**, Professor of Electrical Engineering and Computer Science; B.S.E.E. 1965, M.S.E.E. 1969, Ph.D. 1974, Syracuse University

**William St. John**, Adjunct Professor of Management; B.S. Siena College, M.S. Union College

**Josef Schmee**, Kenneth B. Sharpe Professor of Management; Magister 1968, University of Vienna; M.S. 1970, Ph.D. 1974, Union College

**Paul Scott**, Adjunct Associate Professor of Educational Studies; B.S. 1986 Cornell University; M.S. 1989 Pennsylvania State

**Mehmet Fuat Sener**, Assistant Professor of Economics; B.S. 1993, Middle East Technical University, Turkey; M.S. 1995, London School of Economics; Ph.D. 1999 University of Florida

**Wayne Shelton**, Associate Professor of Medicine, AMC. B.A. 1972, University of North Carolina at Asheville; M.A. 1979, University of Tennessee; Ph.D. 1987, University of Tennessee; M.A. 1994, University of Chicago; Certificate, 1994, University of Chicago; Fellow, 1994, University of Chicago

**Robert Smith**, Adjunct Assistant Professor of Management; B.S. 1973, Brooklyn College; M.S. 1980, C.W. Post College; M.S. 1987, New School For Social Research

**Harvey D. Solomon**, Adjunct Associate Professor of Mechanical Engineering; B.S. 1963, New York University; Ph.D. 1968, University of Pennsylvania

**Paul Sorum**, A.B. 1965, Stanford University; Ph.D. 1972, Harvard University; M.D. 1980, University of North Carolina at Chapel Hill

**Lance O. Spallholz**, Instructor of Computer Science and Director of the Computer Science Laboratory; B.S. 1969, Union College; M.S. 1974, College of St. Rose; M.S.C.S. 1985, Union College

**Dean T. Spaulding**, Instructor of Educational Studies; B.A. 1997, State University of New York at Plattsburgh; M.S. 1998, State University of New York at Albany; C.A.S. 2000, State University of New York at Albany

**John M. Spinelli**, Associate Professor of Electrical Engineering and Computer Science; B.E. (E.E.) 1983, The Cooper Union; M.S. 1985, Ph.D. 1989, Massachusetts Institute of Technology

**Bonnie Steinbock**, Professor, Philosophy, SUNYA. B.A. 1967, Tufts University; Ph.D. 1974, University of California, Berkeley

**Punkin C. Stephens**, Adjunct Associate Professor of Management; P.A. 1977, School of Medicine, University of California at Los Angeles

**Michael R. Suprunowicz**, Adjunct Professor of Management; B.S. 1977, M.B.A. 1978, State University of New York at Albany; J.D. 1981 Albany Law School

**Martin Strosberg**, Professor of Management; B.A. 1968, Union College; M.A. 1969, M.P.H. 1971, University of California, Berkeley; Ph.D. 1976, Syracuse University

**Carol Lee Szczepanski**, Adjunct Associate Professor of Educational Studies; B.S. 1963, University of Rochester; M.S. 1965, State University of New York at Albany

**Richard Terry**, Adjunct Associate Professor of Educational Studies; B.A. 1961, Villanova University; M.A., Cornell University

**Charles D. Thompson**, Adjunct Assistant Professor of Mechanical Engineering; B.A. 1962, Oberlin College; M.S. 1968, Ph.D. 1971, American University

**Dan R. Thompson**, Associate Professor of surgery, AMC; B.S. Ferris State University; M.D. 1979, Wayne State University;

**Cherrice Traver**, Associate Professor of Electrical Engineering and Computer Science; B.S. 1982, State University of New York at Albany; Ph.D. 1988, University of Virginia

**Karen Martino Valle**, Adjunct Associate Professor of Management; B.S. 1973, St. John's University, College of Business Administration; J.D. 1976, St. Johns University, School of Law; L.L.M. 1980, New York University, School of Law

**Frank E. Wicks**, Associate Professor of Mechanical Engineering; B.S. 1961, State University of New York Maritime College; M.S. 1966, Union College; Ph.D. 1976, Rensselaer Polytechnic Institute; P.E.

**Richard D. Wilk**, Associate Professor of Mechanical Engineering; B.S. 1980, M.S. 1982, Ph.D. 1986, Drexel University

**George H. Williams**, Professor of Electrical Engineering and Computer Science; A.B., B.E.E. 1965, Union College; M.S. 1966, M. Phil. 1968, Ph.D. 1970, Yale University

**Gary L. Wilson**, Adjunct Associate Professor of Management; A.B. 1974, Washington University; M.D. 1977, Southern Illinois University

**Suthathip Yaisawarng**, Associate Professor of Economics; B.B.A. 1977, Thammasat University, Thailand; M.B.A. 1983, Howard University; Ph.D. 1989, Southern Illinois University

## **DEGREES AND CERTIFICATES OFFERED**

	<b>Degrees</b>	<b>HEGIS Code</b>
Bioethics	M.S.	0499
Business Administration	M.B.A.	0506
Clinical Leadership in Health Management	M.S.	1202
Computer Science	M.S.	0701
Educational Studies	M.A.T.	0803
Electrical Engineering	M.S.	0909
Financial Management	Adv. Cert.	0504
Health Systems Administration	M.B.A., Adv. Cert.	1202
Mechanical Engineering	M.S.	0910
Science	M.S.	4902

### **Joint Programs Offered in Conjunction with Other Institutions**

Law and Business Administration (with Albany Law School)	M.B.A.	0506
Law and Business Administration/ Health Systems Administration (with Albany Law School)	M.B.A.	1202
Clinical Leadership in Health Management and Pharmacy Doctorate (with Albany College of Pharmacy)	M.S.	1202

# UNION

## **Graduate and Continuing Studies**

Lamont House Graduate Center  
Schenectady, New York 12308

Telephone: 518.388.6148

Fax: 518.388.6686

<http://www.union.edu>