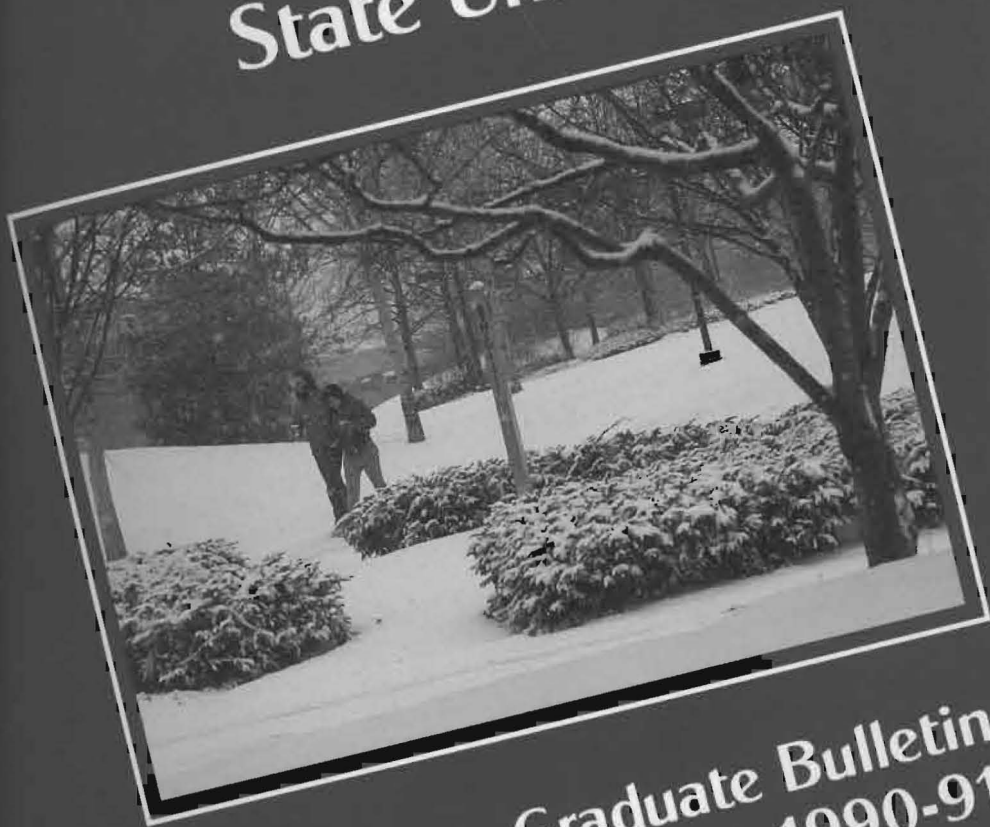




Youngstown State University

# Youngstown State University



Graduate Bulletin  
1990-91





**TUITION, NONRESIDENT TUITION SURCHARGE,  
SPECIAL PURPOSE FEES, SERVICE CHARGES AND FINES  
FOR 1990-91**

**TUITION**

**Instructional Fee**

Graduate Student, all credits . . . . .	\$ 54 per credit
Undergraduate student, part-time 1-11 credits . . . . .	\$ 46 per credit
Undergraduate student, full-time 12-16 credits . . . . .	\$550 per quarter
Undergraduate student, credits in excess of 16 per quarter . . . . .	\$ 46 per credit

**General Fee (Non-instructional services)**

Part-time student, 1-11 credits . . . . .	\$ 15 per credit
Full-time student, 12 or more credits . . . . .	\$180 per quarter

**NONRESIDENT TUITION SURCHARGE**

Part-time student, 1-11 credits . . . . .	\$ 34 per credit
Full-time student, 12 or more credits . . . . .	\$400 per quarter
Credits in excess of 16 per quarter . . . . .	\$ 34 per credit

**FEES AND OTHER STUDENT CHARGES**

Performance Music Fee — Tuition plus . . . . .	\$ 14 per credit
Application Fee (graduate students) . . . . .	\$ 30
Application Fee (undergraduate students) . . . . .	\$ 20
Change of Registration Fee . . . . .	\$ 6
Credit by Examination Fee . . . . .	\$ 20 per course
Graduation Fee . . . . .	\$ 25
Proficiency Examination Fee . . . . .	\$ 10
Transcript Fee . . . . .	\$ 3 per copy
Student Locker Rental . . . . .	\$ 5 per academic year
Thesis Binding Charge . . . . .	\$ 10
<b>Health &amp; Physical Education Locker and Towel Charge:</b>	
Student registered for H&PE Course . . . . .	No Charge
All others authorized to use facilities . . . . .	\$ 10 per quarter
Lock Replacement Charge . . . . .	\$ 5
Towel Replacement Charge . . . . .	\$ 5
<b>Health &amp; Physical Education Activity Charge:</b>	
Variable to cover cost in specified courses.	
Charge set by and paid to vendor.	
Diploma Mailing Charge . . . . .	\$ 5
(Not assessed those attending commencement)	
Diploma Replacement Charge . . . . .	\$ 30
Registration Withdrawal Fee . . . . .	\$ 10
Career Services Credentials Fee . . . . .	\$ 2
I.D. Replacement Charge . . . . .	\$ 5
I.D. Validation Sticker Replacement Charge . . . . .	\$ 3
Late Registration Fee . . . . .	\$ 30
Late Payment Fee . . . . .	\$ 15
Returned Check or Credit Card Fee . . . . .	\$ 12

Child Development Laboratory Charge	\$ 25 per quarter
Elementary Education Reading Specialist Charge	\$ 25 per quarter
Early Childhood Practicum Charge	\$ 25 per quarter
ROTC Activity Fee	\$ 4 per quarter
Parking Permit Charge	\$ 25 per quarter
Per entrance without permit	\$ 1
Kilcawley House and Lyden House:	
Room & Board	\$3405 per academic year
Security Deposit (Paid first quarter of occupancy)	\$ 50
Single Room Surcharge	\$ 200 per quarter
Room per 5-week Summer Session	\$ 220
Single Room Surcharge per 5-week Summer Session	\$ 50
Voluntary Board Plan (Students rooming in Weller House and students not rooming in other University-owned housing):	
19 Meals per week	\$ 425 per quarter
15 Meals per week	\$ 395 per quarter
10 Meals per week	\$ 370 per quarter
5 Meals per week	\$ 210 per quarter
Intramural Team Deposit	\$ 10
Intramural Team Protest Charge	\$ 5
Neon: Student prepaid	\$ 15
Neon: Non-student or student not prepaid	\$ 20
Library Carrel Key Deposit	\$ 10
Parking Violation Fines:	
Class I (all violations except those in Class II)	\$ 5
Class II (parking in a handicap zone without proper permit, parking at a no parking sign, tow away zone, loading zone, official use only sign, fire lane, or in the campus core area)	\$ 13
Fines to double if not paid in 10 days.	
Library Fines:	
(1) Overdue book: 10¢ per day to maximum of \$5, plus cost of book replacement, plus \$10 processing charge.	
(2) Overdue reserve book: 55¢ per day to a maximum of \$11, plus cost of book replacement, plus \$10 processing charge.	
(3) Unauthorized removal of closed reserve book: same as for overdue reserve, plus \$5.	

THE UNIVERSITY RESERVES THE RIGHT TO CHANGE ANY FEE WITHOUT NOTICE.

# Youngstown State University Bulletin

Graduate  
Edition  
1990-91

Effective September 1990  
Youngstown, Ohio

Youngstown State University reserves the right to change without notice any statement in this bulletin concerning, but not limited to, rules, policies, tuition, fees, curricula, and courses.

Youngstown State University is committed to a policy of nondiscrimination on the basis of sex, race, religion, color, age, national origin or handicap, in respect to applicants for admission, students, employees, applications for employment and organizations providing contractual services to it.

Inquiries should be addressed to Youngstown State University's Assistant to the President for Affirmative Action, who is responsible for coordinating the University's programs for compliance with Section 504 of the Rehabilitation Act of 1973 and Title IX of the Education Amendments of 1972. Inquiries can be initiated in writing or by calling (216) 742-3370.

**YOUNGSTOWN STATE UNIVERSITY BULLETIN**

(USPS 697-340)

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GRADUATE CATALOG  
ISSUE  
EFFECTIVE SEPTEMBER 1990  
YOUNGSTOWN, OHIO

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### OHIO BOARD OF REGENTS

	Term Expires
Robert L. (Bob) Evans .....	1990
N. Victor Goodman .....	1990
Richard L. Krabach .....	1990
Alva T. Bonda, Chair .....	1993
Lloyd O. Brown, Secretary .....	1993
Anita S. Ward, Vice Chair .....	1993
Paul M. Dutton .....	1996
Ralph K. Frasier .....	1996
Raymond T. Sawyer .....	1996
William C. Coulter, Chancellor	

### YOUNGSTOWN STATE UNIVERSITY BOARD OF TRUSTEES

	Term Expires
Ralph M. Crum, Student Trustee .....	1991
vacant, Student Trustee .....	1991
Emily P. Mackall .....	1991
John F. Geletka, D.D.S. ....	1992
Earnest Perry, M.D. ....	1993
Michael I. Monus .....	1994
Elizabeth C. DeLuca .....	1995
Richard P. McLaughlin .....	1996
Edward A. Flask .....	1997
Mark E. Lyden .....	1998
Martin J. O'Connell .....	1999

## ADMINISTRATIVE OFFICERS

Neil D. Humphrey, Ed.D., President

Bernard T. Gillis, Ph.D., Provost

Charles A. McBriarty, Ed.D., Vice President — Student Services

Lawrence E. Looby, Ph.D., Vice President — Institutional Advancement

Sally M. Hotchkiss, Ph.D., Associate Provost and Dean of Graduate Studies

## ACADEMIC ADMINISTRATION

The College of Arts and Sciences

Bernard J. Yozwiak, Ph.D., Dean

The Warren P. Williamson, Jr. School of Business Administration

James S. Cicarelli, Ph.D., Dean

The School of Education

David P. Ruggles, Ph.D., Dean

The William Rayen School of Engineering

George E. Sutton, Ph.D., Dean

The College of Fine and Performing Arts

David Sweetkind, Ph.D., Dean

The College of Applied Science and Technology

Victor A. Richley, Ph.D., Dean

## THE GRADUATE SCHOOL

3001 Jones Hall

(216) 742-3091

Sally M. Hotchkiss, Ph.D., Associate Provost and Dean of Graduate Studies

## THE GRADUATE COUNCIL

Jack D. Bakos, Jr., Civil Engineering

Frederick J. Blue, History

Barbara H. Brothers, English

Randy L. Hoover, Secondary Education

Anne M. McMahon, Management

Howard D. Mettee, Chemistry

A. Duane Sample, Music

John J. Yemma, Allied Health

Nancy C. Hockenberry, GSAC

Sally M. Hotchkiss, Associate Provost (ex officio)



## STANDING COMMITTEES OF THE GRADUATE SCHOOL

### CURRICULUM

Jack D. Bakos, Civil Engineering (Chair)  
Violet F. Boggess, Business Education & Technology  
Darla J. Funk, Music  
Janet Gill-Wigal, Counseling  
Daryl W. Mincey, Chemistry  
Virginia Monseau, English  
Jane S. Reid, Marketing  
Paul A. Melidona, GSAC

### GRADUATE FACULTY MEMBERSHIP

Barbara H. Brothers, English (Chair)  
John J. Buoni, Mathematical & Computer Sciences  
Leslie S. Domonkos, History  
Ronald L. Gould, Music  
Richard W. Jones, Materials Engineering  
Thomas L. Rakestraw, Jr., Management  
Jane A. VanGalen, Foundations of Education  
Joseph A. Waldron, Criminal Justice (Chair)  
Christopher Harrison, GSAC

### GRADUATE STUDENT ADVISORY (GSAC)

Christopher J. Harrison, Chemistry  
Nancy C. Hockenberry, Elementary Education & Reading  
Tammy A. King, Criminal Justice  
Paul A. Melidona, Music  
James A. O'Leary, Civil Engineering  
Rosalyn I. Torella, Management  
John J. Yemma, Allied Health (Council)

### GRADUATE STUDENT GRIEVANCE

Bege K. Bowers, English  
Laurie E. Delaney, English (student)  
Wade C. Driscoll, Industrial Engineering  
Tammy A. King, Criminal Justice (student)  
Samuel A. McKinney, Biological Sciences (student)  
A. Duane Sample, Music (Chair)

**POLICY**

- Richard L. Burden, Mathematical & Computer Sciences
- Lawrence E. Cummings, Criminal Justice
- Randy L. Hoover, Secondary Education (Chair)
- Kathleen M. Kough, Speech Communication & Theatre
- Salvatore R. Pansino, Electrical Engineering
- P. Ellis Stoll, Marketing
- James A. O'Leary, GSAC

**SCHOLARSHIPS, ASSISTANTSHIPS, AND AWARDS**

- Bernadette Angle, Special Education
- Rama Krishnan, Management
- Edward J. Largent, Jr., Music
- Anne M. McMahon, Management (Chair)
- Donald J. Milley, Economics
- Sandra W. Stephen, English
- Calvin J. Swank, Criminal Justice
- Frank J. Tarantine, Mechanical Engineering
- Rosalyn I. Torella, GSAC

## THE ACADEMIC CALENDAR 1990-91

### FALL 1990

Date	Day	Time	Event
May 14	Mon.		Registration of current students begins
May 24	Thurs.		Registration of current students ends
Aug. 15	Wed.		Last day to apply for admission
			Registration of admitted new and former students by appointment during summer
Sept. 3	Mon.		Legal holiday — University closed (Labor Day)
Sept. 12	Wed.		Change of registration
Sept. 13	Thurs.		Change of registration
Sept. 14	Fri.		Registration of admitted new and former students (payment due at registration)
Sept. 17	Mon.		Faculty Meeting
Sept. 18	Tues.	1800	Late and final registration (payment due at registration)
Sept. 19	Wed.	0800	Classes begin
Sept. 25	Tues.	1800	Last day to add a class
Oct. 1	Mon.	1700	Last day to apply for fall quarter graduation
Oct. 30	Tues.	1800	Last day to withdraw with a W
Nov. 12	Mon.		Legal holiday — University closed (Veteran's Day)
Nov. 21	Wed.	2300	Thanksgiving academic break begins
Nov. 22	Thurs.		Legal holiday — University closed (Thanksgiving Day)
Nov. 23	Fri.		Legal holiday — University closed (Columbus Day)
Nov. 26	Mon.	0800	Thanksgiving academic break ends
Dec. 3	Mon.	0800	Final examinations begin
Dec. 8	Sat.	1700	Final examinations end

### WINTER 1991

Nov. 5	Mon.		Registration of current students begins
Nov. 15	Thurs.		Last day to apply for admission
Nov. 20	Tues.		Registration of current students ends
Dec. 12	Wed.		Registration of admitted new and former students
Dec. 13	Thurs.		Late and final registration
Dec. 14	Fri.		Change of registration
Dec. 24	Mon.		Legal holiday — University closed (President's Day)
Dec. 25	Tues.		Legal holiday — University closed (Christmas Day)
Jan. 1	Tues.		Legal holiday — University closed (New Year's Day)
Jan. 7	Mon.	0800	Classes begin
Jan. 12	Sat.	1200	Last day to add a class
Jan. 14	Mon.	1700	Last day to apply for winter quarter graduation
Jan. 21	Mon.		Legal holiday — University closed (Martin Luther King Day)
Feb. 16	Sat.	1200	Last day to withdraw with a W
Mar. 18	Mon.	0800	Final examinations begin
Mar. 23	Sat.	1700	Final examinations end
Mar. 30	Sat.	1000	Winter Commencement

**SPRING 1991**

Feb. 15	Fri.		Last day to apply for admission
Feb. 18	Mon.		Registration of current students begins
Feb. 28	Thurs.		Registration of current students ends
Mar. 8	Fri.		Registration of admitted new and former students
Mar. 25	Mon.		Change of registration
Mar. 26	Tues.		Registration of admitted new and former students
			Late and final registration
			(payment due at registration)
Apr. 1	Mon.	0800	Classes begin
Apr. 6	Sat.	1200	Last day to add a class
Apr. 8	Mon.	1700	Last day to apply for spring quarter graduation
May 11	Sat.	1200	Last day to withdraw with a W
May 27	Mon.		Legal holiday — University closed (Memorial Day)
June 10	Mon.	0800	Final examinations begin
June 15	Sat.	1700	Final examinations end
June 22	Sat.	1000	Spring Commencement

**SUMMER 1991**

May 13	Mon.		Registration of current students begins
May 15	Wed.		Last day to apply for admission
May 16	Thurs.		Registration of current students ends
May 18	Sat.		Registration of admitted new and former students
June 10	Mon.		Change of registration for full term and first term classes
June 11	Tues.		Registration of admitted new and former students
			Late and final registration
			(payment due at registration)
June 17	Mon.	0800	Classes begin — full term and first term classes
June 21	Fri.	1700	Last day to add a class — first term classes
June 24	Mon.	1800	Last day to add a class — full term classes
June 24	Mon.	1700	Last day to apply for summer quarter graduation
July 4	Thurs.		Legal holiday — University closed (Independence Day)
July 8	Mon.	1800	Last day to withdraw with a W — first term classes
July 19	Fri.		Change of registration for second term classes
July 20	Sat.	1700	First term ends (final examinations are given during last scheduled class period)
July 22	Mon.	0800	Classes begin — second term classes
July 26	Fri.	1700	Last day to add a class — second term classes
July 29	Mon.	1800	Last day to withdraw with a W — full term classes
Aug. 12	Mon.	1800	Last day to withdraw with a W — second term classes
Aug. 23	Fri.	2200	Second term and full term ends (final examinations are given during last scheduled class period)
Aug. 24	Sat.	1000	Summer Commencement

Times provided above are based on the 24-hour system, in which the day begins at midnight and hours are numbered consecutively through 2400. Thus, 8:00 a.m. is 0800, and 8:00 p.m. is 2000.

All registration is by appointment only and is concluded prior to the beginning of classes for each quarter.

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### GENERAL INFORMATION

Youngstown State University is located in downtown Youngstown, an industrial center in northeastern Ohio midway between Pittsburgh and Cleveland.

Youngstown State University had its beginning in 1908 with the establishment of the School of Law of the Youngstown Association School, sponsored by the Young Men's Christian Association.

In 1920, the State of Ohio empowered the school to grant the degree Bachelor of Laws; in the same year the school offered a four-year course in business administration. In 1921, the school changed its name to The Youngstown Institute of Technology, and liberal arts classes were offered, in the evening, for the first time.

In 1927, the College of Arts and Sciences, offering daytime classes, was established. In 1928, the Institute changed its name to Youngstown College, and in 1930, the College began to confer the degree Bachelor of Arts.

Dana's Musical Institute, founded in nearby Warren in 1869, became the Dana School of Music of the College in 1941. In 1946, the engineering department, organized several years before, became the William Rayen School of Engineering; two years later the business administration department became the School of Business Administration, which was renamed the Warren P. Williamson School of Business Administration in 1981; and in 1960, the department of education became the School of Education. The Graduate School and the College of Applied Science and Technology were established in 1968. In 1972, the University became a member of a consortium formed by the University of Akron, Kent State and Youngstown State universities to sponsor the Northeastern Ohio Universities College of Medicine. The College of Fine and Performing Arts was established in 1974.

In 1944, the trustees of the Young Men's Christian Association transferred control of the institution to members of the Corporation of Youngstown College, and in 1955, the Corporation was re-chartered as The Youngstown University. In 1967, the University joined the Ohio system of higher education and the name was changed to Youngstown State University. A Board of Trustees of nine members was appointed by the Governor with concurrence by the Senate. As in the case of other state-assisted institutions in the Ohio higher education system, the University is also responsible to the Ohio Board of Regents.

From 1931 to 1966, Dr. Howard W. Jones served as chief executive of the University. In September 1966, he was succeeded by Dr. Albert L. Pugsley, former administrative vice president at Kansas State University. Dr. Pugsley was the University's second president. Dr. John J. Coffelt, vice president for administrative affairs at the University since 1968, became president in 1973, and retired in 1984. Dr. Neil D. Humphrey, formerly the University's executive vice president, is the current president.

The University offers complete curricula in the liberal arts and in many technical and professional undergraduate fields. The degrees Bachelor of Arts, Bachelor of Engineering, Bachelor of Fine Arts, Bachelor of Music, Bachelor of Science, Bachelor of Science in Applied Science, Bachelor of Science in Education, Bachelor of Science in Business Administration, and Bachelor of Science in Nursing are granted. A broad selection of two-year programs leading to the degrees Associate in Arts, Associate in Applied Business, Associate in Applied Science, and Associate in Labor Studies is offered. The University is accredited by the North Central Association of Colleges and Secondary Schools and by appropriate professional accrediting bodies. A co-educational institution, it had an enrollment of 300 students in 1930, grew to 2,000 in the 1940's, tripled by the 1950's, reached 10,000 in the mid-sixties, and recorded over 15,000 in the fall of 1986.

#### Mission

Youngstown State University is an urban university, assisted by the State of Ohio, and maintained to provide a wide range of opportunities in higher education primarily, but not exclusively, to the residents of northeastern Ohio and western Pennsylvania. The University is committed to broad access to education: academic access through open admission to all Ohio high school



graduates to a wide range of programs; economic access through reasonable tuition charges and a strong program of financial aids; and geographic access through concentration on the needs of the students who commute to campus without neglect of the needs of students living on or near campus.

Youngstown State University seeks to enrich and liberate the minds of its students that they may be fully developed men and women, conscientious and productive citizens and responsible and understanding partners with others in life, family and work. The University seeks to prepare its students for the future, not just to adapt or succumb to it, but to play active roles in shaping the future. To this end the University seeks to combine the best elements of the long tradition of humanistic, liberal education with education in the most significant advancements in science and technology.

The University is committed to quality in teaching, scholarship, research and public service. The University seeks faculty who combine these elements in ways that bring excitement to the classroom and laboratory, and stimulate enthusiasm and eagerness for learning in students. The University sees the primary test of its effectiveness in the high quality of its graduates, the kinds of lives they lead, their accomplishments and their services to society. In this sense, teaching is the primary function and mission of the University and its faculty, while scholarship and research undergird and strengthen this function.

Public service has assumed a greater importance than in years past. As the people of Youngstown and the University's service region have encountered a variety of economic problems in recent years, they have developed a greater need of assistance from the University than previously existed; as the University, in turn, faces problems in the 1980's, it experiences a greater need for community support and assistance. Within the limits of available resources, the University will continue to provide professional expertise to governmental bodies and businesses in the area. The University will increase its activities in the area of financial development, seeking methods of securing additional income from corporate and governmental sources. The University will seek to maintain its role as a point of institutional stability and community pride within its service region.

### **Affirmative Action Office Statement of Policy**

Youngstown State University shall operate within an effective affirmative action program to promote equal employment opportunities and also to ensure non-discrimination in all of its educational programs and services.

Youngstown State University shall operate in compliance with the *Civil Rights Act of 1964*, as amended by Executive Order 11246, and also with *Title IX Regulations* implementing the *Education Amendment of 1972*.

Explicitly, it is the policy of Youngstown State University to reaffirm its commitment towards non-discrimination on the basis of sex, race, religion, color, age, national origin, or handicap, to: 1) applicants for admission to the University, and 2) matriculating students in its execution of the operational educational programs; also, 3) employees of the University; 4) applicants for employment to the University; and 5) organizations extending contractual services to the University.

### **Responsibility and Implementation**

The University shall maintain an active Affirmative Action Office and Committee, under the direction of the Assistant to the President for Affirmative Action. This office shall periodically review the Affirmative Action program; discuss grievances and charges of discrimination; and extend recommendations for achieving an effective affirmative action program. The ultimate responsibility for maintaining a viable and effective Affirmative Action program rests with the President of the University.

The University shall make available a written affirmation of its Affirmative Action program to all people associated with the University — every student, staff member, faculty member, and employee. Further, the University shall make written and public announcements of its equal

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opportunity employment policy and its Affirmative Action program (communicated by television and radio messages, publications in appropriate journals and magazines, announcements in replies to correspondence, and by posting of the Affirmative Action program at conspicuous locations on campus).

### THE CAMPUS

During its earlier years the institution had a number of homes. Starting in the old Central Y.M.C.A. building, it occupied various sites on Wick Avenue until the completion of Jones Hall in 1931. Additional buildings have been constructed and nearby properties converted to University use, so that today the campus extends through much of an area four blocks long and three blocks wide, covering 85 acres.

The University is currently engaged in a multi-million dollar campus development program. The first major step was the completion in 1966 of Kilcawley Center. The building contains dining rooms, meeting rooms, lounges, and recreational areas including rooms for billiards, table tennis, and television viewing. Student offices are included in the facility, as are a bookstore, a bank, facilities for various student publications, and the International Student Services Office.

In 1967, the Ward Beecher Hall, a large addition to the Science Building, was completed. This structure contains laboratories, classrooms, a planetarium, and offices for chemistry, biology, physics, and astronomy. The planetarium is the largest in Ohio in seating capacity (150 seats).

The University opened its Engineering Science Building in 1968. This building houses the William Rayen School of Engineering and the department of geology. The structure contains an auditorium seating 288, a fluid-flow laboratory that extends two stories, and a chemical engineering chamber that extends three floors to accommodate absorption and distillation equipment.

In September, 1970, the School of Business Administration Building, made possible by The University Foundation, Inc., was dedicated. Renamed Williamson Hall in 1981, the recently remodeled six-story structure houses the Warren P. Williamson, Jr. School of Business Administration.

Beeghly Physical Education Center was completed early in 1972. The building houses the Department of Health and Physical Education. Its facilities include a large gymnasium with spectator seating, and an Olympic-size swimming pool. There are 17 classrooms including laboratories for health research and kinesiology; separate gymnasiums for wrestling, weight lifting, gymnastics, and physical education for the handicapped; handball and squash courts; and a rifle range.

Cushwa Hall, completed in 1976, houses the departments and the dean of the College of Applied Science and Technology as well as the Media Center, WYSU-FM Radio, the Geography Department, Continuing Education/Education Outreach, and the Mathematical and Computer Sciences Department. One of the largest buildings on campus, it contains 52 classrooms, 70 laboratories, 169 offices and 23 conference-seminar rooms.

A building to house the College of Arts and Sciences offices and classrooms, now named DeBartolo Hall, was occupied early in 1978. The departments of Economics, English, Foreign Languages and Literatures, History, Philosophy and Religious Studies, Political Science and Social Science, Psychology, and Sociology, Anthropology and Social Work, as well as the offices of the dean, are located in this six-story structure. Also located in this building are five student lounge/study areas, a computer terminal room and a 210-seat lecture hall with stage.

Housing the College of Fine and Performing Arts, Bliss Hall was completed in 1976. Its facilities include the 409-seat theatre, Ford Auditorium; the 237-seat Choral Recital Hall; an experimental theatre with flexible seating for up to 250; 70 music practice rooms, equipped with studio or grand pianos; a Schlicker performance organ and two Flentrop practice organs; 27 faculty office-studios which can be used for music instruction; a band/orchestra room with a library; a photography studio with 18 enlargers; a crafts studio with 18 weaving looms; fully equipped

drawing, advertising, printmaking, sculpture, and painting studios; a complete shop with heavy equipment for working in three-dimensional design; art faculty office-studios; a student lounge/art gallery; a materials center with a collection of 6000 LP's, 2000 volumes of musical scores, and 50,000 art slides; and conference and seminar rooms.

Meshel Hall, dedicated January 1986, houses expanded facilities for academic and administrative computer use, broadens the Youngstown State University educational programs, and provides local business and industry with highly trained personnel. The state-of-the-art center is for instruction, research and application in advanced computer technology including computer-assisted design and robotics which will serve the entire University community. The building contains 7 classrooms, 13 specialized computerized laboratories, 25 faculty offices, and a large atrium for student study. The fourth floor houses the University's main computer facilities and Computer Center staff. The Harry Meshel Hall total project cost was \$15,000,000 which includes the structure, furnishings and equipment.

The All-Sports Complex was opened in 1982. This facility, located on an 18-acre site adjacent to Beeghly Physical Education Center, includes a 16,000-seat stadium and multi-purpose sports field for football, field hockey, and soccer. The stadium, named for the late Arnold D. Stambaugh, houses offices, classrooms, gymnasiums, locker rooms, and athletic facilities.

## FACILITIES AND SERVICES

### The William F. Maag Library

The University's William F. Maag Library opened in January 1976. The six-story structure is an attractive and comfortable environment for study and research. A member of the Online Computer Library Center automated network, the Library provides reference, government documents, interlibrary loan and other services necessary to meet the needs of the University community. In addition, the library has an online public access catalog (the Virginia Tech Library System) with over 20 in-library terminals plus several dial-in lines. Dialog and a growing number of CD-ROMs provide access to over 200 online databases both on and off campus.

The Library offers instructional and research materials in books, periodicals and microfilms. These holdings number more than 571,268 bound volumes and over 842,626 microforms, in addition to 155,257 government documents. Periodicals, microforms and micro readers are housed on the first floor. A copy management center allows both self-service or operator-serviced copies. The second floor is the main floor, where most user services and Library offices are located. Government Documents is on the sixth floor. The book collection is distributed throughout the second through sixth floors in open stacks, with split level design between stack and reading areas. Study carrels and Scholar Studies are located on five of the floors.

### The Computer Center

The Computer Center is a centralized computational facility that provides for decentralized access by faculty, staff, and students throughout the University. The Center occupies the fourth floor of Meshel Hall, an 87,000 square-foot advanced technology center. The Center employs 29 full-time professional support staff who oversee daily operations and conduct long-range planning to meet the increasing needs of YSU for computer support.

Serving both academic and administrative needs, the Computer Center operates an AMDAHL 5868 Multiprocessor (equivalent to two IBM 3081GXs) with 48 million characters of main memory and approximately 53 billion characters of online conventional and solid state disk storage. The computer complex is complemented by approximately 700 online devices, including terminals, personal computers, printers, plotters and projection systems.

Students have access to the computer either in the batch mode or interactively, using IBM 3270 color display terminals located in various academic departments throughout campus. The main facilities are located in Meshel Hall, which contains 7 classrooms and 12 laboratories dedicated to student use. Telephone lines are provided for remote access off-campus.



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A total of 225 IBM PCs are available on a local area network for instruction and research. These networked PCs allow access to a variety of software, as well as other facilities, such as the Maag Library Online Catalog and the Youngstown FreeNet community computer system.

An Ethernet backbone through the heart of campus connects the AMDAHL 5868 with the Mathematical and Computer Sciences Department's UNIX-based parallel processor along with Maag Library's Online Catalog. Access to the Cray YMP8/864 supercomputer located at the Ohio Supercomputer Center in Columbus is also supported via the network.

A full-time professional staff and part-time student assistants are available for consultation on course work and research projects. A wide variety of software and peripheral equipment are explained in full detail in the Computer Center's annual publication, *The Guide to Academic Computing*. Computing services available to students and faculty are described in this publication but are also available via online tutorials using computer-based education techniques.

### The Bookstore

The Youngstown State University Bookstore, located at the west end of Kilcawley Center, sells required texts, materials, and supplies. In addition, the Bookstore stocks a wide selection of standard works in inexpensive editions because of their value as collateral reading. Should a selection not be available, the Bookstore will order it upon a suitable down payment. There are other stores in the Youngstown area serving the University that will add variety to available material. While the Youngstown State University Bookstore does not attempt to compete with these stores, it does carry a selection of personalized soft goods, specialty, and gift items. The aims of the Youngstown State University Bookstore are predicated on service to students, faculty and staff.

### Kilcawley Center

Kilcawley Center is the community center of the University for all the members of the University family — students, faculty, administration, alumni, and guests. It is not just a building; it is also an organization and a program. Together they represent a well-considered plan for the community life of the University.

As the *living room* or the *hearthstone* of the University, the Center provides the services, conveniences and amenities the members of the University family need in their daily life on the campus, and facilities for getting to know and understand one another through informal association outside the classroom.

Kilcawley Center is part of the educational program of the University. As the center of University community life, it serves as a laboratory of citizenship, training students in social responsibility and for leadership in a democratic society.

Through its various boards, committees, and staff, it provides a cultural, social, and recreational program, aiming to make free time activity a cooperative factor with study in education.

In all its processes it encourages self-directed activity, giving maximum opportunity for self-realization and for growth in individual social competency and group effectiveness. Its goal is the development of persons as well as intellects.

Kilcawley Center attempts to meet the diversified needs of the University community in its food service program. The Snack Bar, which has been contracted to Arby's, offers a variety of fast foods designed to meet the needs of today's commuting student. A full breakfast is offered beginning at 7:00 a.m., while the evening student arriving after work may choose from a varied menu including roast beef. For those not taken by the fast food craze, breakfast, a full cafeteria-style menu, as well as a variety of sandwiches are offered in the first floor Terrace Room.

For those who wish to dine in a more relaxed atmosphere, the Wicker Basket offers a choice of table service menu items, or a moderately priced buffet-style meal including a salad bar. In addition to the Wicker Basket, the second floor houses dining facilities for students living in Kilcawley, Lyden, and Weller Houses, and for students not rooming in University-owned housing. Students who are not residents may purchase a quarterly meal ticket or individual meals in the Brass Rail Cafe.

Groups who wish to avail themselves of Kilcawley Center catering services may choose from a selection of buffet and table service menus, served a variety of attractive conference rooms, with service available for groups of up to 450 persons.

### **Counseling, Testing, and Handicapped Services**

The Counseling Center staff includes several counseling psychologists and a testing director. All are experienced professionals who specialize in working with college students who might be concerned with adapting to college life, academic progress, career choice, drugs, family, and marriage.

The Counseling Center administers the American College Test, the Graduate Record Examination, the Miller Analogies Test, The Law School Admission Test, Medical College Admission Test, and the Graduate Management Admission Test. Information regarding other national examinations is available.

The Counseling Center acts as an advisor for students who have physical handicaps. The Center acts as a liaison with community agencies, provides general assistance and advisement, and assists with registration so that students will have an opportunity to schedule classes according to location and time.

Counseling services are free to all students of the University. Fees, however, are associated with the testing programs.

No information is released to officers of the administration, to faculty members, to parents of students aged 18 or over, or to outside agencies without the student's explicit authorization, except when there is a clear and immediate threat to the life or welfare of the student or the community at large. Information obtained in the course of counseling remains confidential and in no way reflects upon the student's academic record.

### **Student Health Service**

The Student Health Service Office is maintained by the University for the purpose of providing emergency medical care to students while they are on campus. The cost of the service is included in the general fee; however, all additional treatment by non-University physicians, clinics, or hospitals must be paid for by the student. Any accident which results in injury to the student involved should be reported to the Student Health Service Office within twenty-four hours.

A voluntary group-accident-and-sickness insurance program specifically written to meet the needs of University students is available at the time of initial registration for each academic year. A brochure explaining this program is available at the Student Health Service Office, Student Services Offices and Bursar's Office. All foreign students who are not permanent residents of the United States and all residents of University-owned housing are required to participate in this or a comparable program of health and accident insurance during their entire period of enrollment at Youngstown State University.

### **Career Services**

The University maintains a Career Services Office to provide professional assistance to students and alumni in career exploration and employment placement. Students are encouraged to make use of the office for aid in career planning and decision making. The office is a member of the National College Placement Council, Inc., and both national and local employers come to the campus to interview students and alumni seeking employment. Credentials services are provided to certified teachers applying for positions or further studies with schools, colleges and universities.

Students are also assisted in finding employment while enrolled in the University, both on- and off-campus. The location of the University makes it possible for many students to earn all or part of their expenses by working in nearby stores and industrial plants during the school year.

The Career Services Office has an information center which includes career and organization material from over 1,400 employers and many other sources. Over 300 video tapes with career and employer information are also available. Career days are presented through the year as are seminars on job search techniques, resume writing, interviewing techniques and an orientation of the office.

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### Office of Continuing Education

The Continuing Education non-credit programs offer area residents a wide variety of courses, seminars, and conferences to meet the needs of a changing society for professional updating and upgrading, for mid-career adjustments, and for lifestyle changes.

The Professional Development Series offers non-credit courses, both on-campus and in-plant, to help individuals update professional knowledge and skills or explore new areas of knowledge and skill development. These opportunities are offered in three areas: Health and Human Services Programs to meet the needs of various local, county, state, and federal agencies and health settings; Business and Management Programs in many occupational fields; and Engineering, Technology and Computer Programs to meet the needs of a high tech society.

OCE also sponsors seminars and conferences designed to bring the resources of the University to bear on the needs of professionals and community leaders.

The Office of Continuing Education, in accordance with the Board of Trustees and Senate policy, awards the Continuing Education Unit (CEU) in programs that meet the policy requirements. The CEU is a standard unit of measure (10 hours of participation in a Continuing Education course, seminar, or workshop) that has been increasingly used by employers and professional certifying agencies to evidence educational attainment in non-credit post-secondary courses.

### Housing

Although admission to the University does not obligate the University to secure living accommodations for the student, the Housing Office can assist the student in finding a satisfactory place to live.

The University owns and operates four different housing facilities. Three of these, Kilcawley, Lyden, and Wick Houses, are traditional resident hall type facilities. Weller House is apartment-style accommodations.

In addition, there is a wide variety of privately-owned apartments, houses, and rooms for rent in the greater Youngstown area. Housing costs are surprisingly reasonable. The Housing Office maintains a current listing of available off-campus housing.

Applications for University housing or information on off-campus facilities can be arranged by contacting the Housing Office, room 100, Kilcawley House, or by calling (216) 742-3547.

### Food Service (See Kilcawley Center)

### International Student Services

The International Student Services Office (ISSO) provides services for YSU's participants in international educational exchange. Students and scholars from over 50 countries are present on campus. The office serves as the primary campus liaison with agencies of the United States and foreign governments concerned with international educational exchange. ISSO provides information and advice for study abroad and international students and scholars from other lands. Confidential academic, career, cultural, personal, and legal advising is provided.

Programs are maintained for Nonimmigrant Academic & Language Students (F-1) and Exchange Visitors for study and scholarship (J-1) in accordance with the regulations of the U.S. Immigration & Naturalization Service. Special services provided include U.S. immigration advice, pre-arrival and arrival assistance, program advisement, and return/re-entry assistance.

ISSO sponsors special programs to enhance cross-cultural communication, including: WorldFest workshops and programs to increase global awareness and cultural communication; International Coffee Hour, to increase informal campus exchange; International Speakers' Bureau and Friend Families, to provide global information and expertise for campus and community; Partners in American Language (PALS) to match English speakers with English as a Second Language students for cultural exchange; International Orientation, a workshop series to assist new international students adjust to campus and community life and learning.

# THE GRADUATE SCHOOL

## DEVELOPMENT AND ORGANIZATION

On March 28, 1967, the Trustees of The Youngstown University authorized the President and faculty of the University to begin the process of developing graduate programs at the master's degree level, such programs to commence in the fall quarter of 1968. In May, 1967, the Faculty Senate of The Youngstown University considered and authorized the development of master's degree programs in various academic departments of the University. The Youngstown State University Board of Trustees, at its first meeting on August 15, 1967, established the office of the Dean of the Graduate School and the general regulations governing the appointment of a Graduate Faculty. It also identified and authorized the initial graduate degree programs that were to be offered. These programs gained approval of the Ohio Board of Regents on December 15, 1967; preliminary accreditation by the Commission on Colleges and Universities of the North Central Association of Colleges and Secondary Schools in July, 1968; continued accreditation was awarded in 1974, 1978, and 1988. The Graduate School is a member of the Council of Graduate Schools in the United States and the Midwestern Association of Graduate Schools.

The Graduate School is administered by a dean who is also a member of the Graduate Council. The elected members of the Graduate Council consist of one representative of each of the schools/colleges of the University in which graduate programs are offered, two faculty members-at-large elected by the Graduate Faculty and one representative of the Graduate Student Advisory Committee. Standing committees of the Graduate Council are committees on Curriculum; Policy; Graduate Faculty Membership; Scholarships, Assistantships, and Awards; and Student Grievance.

## THE PROGRAMS

The graduate degree programs offered by Youngstown State University are as follows:

Master of Arts (Economics, English, History).

Master of Business Administration (Finance, Management, Marketing).

Master of Music (Performance; Music Theory and Composition; Music History and Literature; Music Education).

Master of Science (Biology, Chemistry, Criminal Justice, Mathematics).

Master of Science in Education (Master Teacher Program for Elementary and Secondary School Teachers; Educational Administration; Counseling; and Special Education).

Master of Science in Engineering (Civil, Electrical, and Mechanical Engineering, and Materials Science).

Early Placement Program for Ph.D. in Engineering, with Akron University.

## ADMISSIONS

Students are admitted to the Graduate School by the Dean of the Graduate School on recommendation of the department in which the applicant wishes to do major work. Admission is required before registration in any course for graduate credit.

The complete application for admission, including supporting materials, should be received by the Graduate School at least four weeks before the beginning of the term in which the applicant plans to register. Youngstown State University will admit graduate students in the fall, winter, spring, and summer quarters, except that foreign students may not enter during the summer or winter quarters.

The attention of foreign students is called to the special requirements governing their application for admission.



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### Application Procedure

Application for admission must be made on a form provided by the Graduate School, following the procedure outlined below. The materials necessary for making application can be secured by writing to the Dean of the Graduate School, Youngstown State University, Youngstown, Ohio 44555-3091.

- 1) Complete the application form and return it with the application fee to the Bursar's Office.
- 2) Request the registrar of each college or university you have attended, except Youngstown State University, to send directly to the Dean of the Graduate School an official copy of the transcript of your work. Personal copies of transcripts will not be accepted. Official transcripts will not be returned. The attention of foreign students is called to the special requirements governing their application for admission.

Applications for admission cannot be reviewed until the official transcripts of all previous college or university work are received. It is imperative, therefore, that the applicant see that these reach the Graduate School at the earliest possible date. Omission of information called for on the application form will necessitate requests for the additional information and therefore delay processing of the application, so the applicant should take care to provide all the information requested in the first submission of materials.

As soon as possible after receipt of application materials, the Graduate Dean will notify the student of the action taken on the application, and if the student is admitted, will have information on registration procedures provided.

### Admission Requirements

Requirements for admission to the Graduate School are:

- 1) A bachelor's degree from an accredited college or university.
- 2) An unrecalculated cumulative grade-point average in undergraduate work of at least 2.5 (on a 4.0 scale). If an undergraduate course has been repeated, both (all) grades received will figure in the calculation of the grade-point average.
- 3) Satisfactory preparation for the graduate program in which the student wishes to enroll, as specified by the department of the major.
- 4) The University reserves the right to request a test of written/spoken English of any entering graduate student whose primary language is not English.

For applicants who are graduates of foreign universities, the following requirements are additional:

- 5) A true or certified copy of the degree earned and all course and examination records, including grades received, beyond the secondary school level.
- 6) Satisfactory score on the Test of English as a Foreign Language (TOEFL), administered internationally by the Educational Testing Service, Princeton, New Jersey, or on the Michigan Test of English, administered by the English Language Institute, Ann Arbor, Michigan. It is expected that students will have attained a sufficient proficiency in the English language to succeed in academic endeavors. Students will be tested and placed in special language classes upon enrollment, if necessary, to ensure an adequate level of proficiency. (For applicants whose first language is English, this requirement is waived.)

The applicant is reminded to check the specific admission requirements of the program in which he/she wishes to enroll, to determine whether there are requirements in addition to those outlined above.

### Types of admission are:

#### 1) Regular

Regular admission will be granted to a student who satisfies the admission requirements for the master's program in which he/she wishes to enroll.

## 2) Provisional

On recommendation of the person in charge of the program involved and subject to the approval of the Graduate Dean, a student may be accepted with provisional admission if the undergraduate record shows slight deficiencies in comparison with the admission requirements of the program to which the student seeks entrance. Students who are admitted provisionally may be required to make up deficiencies by taking the appropriate undergraduate courses without graduate credit. The academic record of all provisional students shall be reviewed when 12 quarter hours of degree credit course work have been completed. The advisor will change the status from provisional to regular if the student's deficiencies have been met and the student's record justifies such a change, and will report the change to the Dean of the Graduate School on the Change of Status form. A continuation of provisional status must be recommended to the Dean of the Graduate School by memorandum.

## 3) Non-Degree

Students with a bachelor's degree who desire to register for courses, but who do not expect to work toward an advanced degree, may be admitted to the Graduate School as non-degree students on recommendation of the department applied to with the approval of the Dean of the Graduate School. A maximum of 12 credits earned as a non-degree student may later be applied toward a degree if accepted by the department in which the student wishes to earn a degree and approved by the Dean of the Graduate School.

## 4) Special Non-Degree

An individual who does not wish to participate in a specific graduate program or be assigned to an advisor in a program may be considered for admission as a special non-degree student by the Dean of the Graduate School. The special non-degree student must meet the prerequisites of the courses prior to enrollment in them. As above, a maximum of 12 quarter hours earned as a special non-degree student may later be applied toward a degree if the student and the credits are accepted by the department in which the student wishes to earn a degree and the department's recommendation is approved by the Dean of the Graduate School.

## 5) Restricted

Students who wish to take a workshop for graduate credit but who have not completed the regular Graduate School admission process will be permitted to register in the Graduate School as restricted graduate students. Such permission is granted by the Dean of the Graduate School, through the workshop representative, upon receipt of a completed Workshop Registration Form, which includes a statement signed by the applicant that a baccalaureate degree has been received.

Workshop courses, upon approval of the graduate advisor, may be applied to degree work at a later date if regular admission to the Graduate School is obtained and if those courses are part of the degree program.

Workshop courses are those specifically designated as such in the Graduate Catalog or by the Graduate Council.

## 6) Transient

Transient admission may be granted to a student who is in a degree program at an accredited graduate school and who submits a graduate transient student form signed by the dean of the graduate school to which he/she wishes to transfer credit, showing that he/she is a graduate student in good standing. The form to be used in such cases may be secured from the Youngstown State University Graduate School office. Under some circumstances transient admission may be renewed for a second quarter, but the graduate deans of both universities must approve the renewal.

If a transient student later wishes to become a regular graduate student, the student must be admitted to a degree program by following the usual admission procedures.

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### Transfer Credits

Up to 12 quarter hours (eight semester hours) of graduate work recently completed at other accredited institutions may be applied toward a master's degree at Youngstown State University, provided the student earned a grade of A or B in such courses. The number of transfer credits to be accepted in each case is to be determined by the Graduate Dean on the basis of evaluation and recommendation by the department of the student's major. It is the responsibility of the student to initiate a request for the approval of transfer credits. Transfer hours are not included in the calculation of the student's cumulative grade-point average.

### Test Information

In certain master's programs test results must be submitted as part of the admissions procedure. The registration forms for both the Graduate Record Examination and the Graduate Management Admission Test may be secured from the Counseling and Testing Center, Youngstown State University; but the applicant must register for the test with the Educational Testing Service, Box 955, Princeton, New Jersey 08540. The student should check with the Youngstown State University Testing Office to learn the deadline dates for registering for these examinations. Arrangements for taking the Miller Analogies Test should be made directly with the Testing Office.

### International Admissions

International applicants must provide all materials required at least three months prior to the quarter they wish to be considered for admission.

1) A true or certified copy of the degree earned and all course and examination records, including grades received, beyond the secondary school level.

2) A graduate of a foreign university who is a non-native English speaker, must score a minimum of 525 on the Test of English as a Foreign Language (TOEFL) administered by the Educational Testing Service, Princeton, New Jersey; or, score a minimum of 84 on the Michigan English Language Battery (MELAB) administered by the English Language Institute, Ann Arbor, Michigan. Prior to full admission to academic study, students are tested and placed in special English classes, if necessary, to ensure an adequate level of English proficiency.

For F-1 or J-1 visa certification:

3) Certification of good health, including medical history and physician's examination.

4) Evidence of financial support and sponsorship during the period of study at Youngstown State University, including documents of verification;

5) An international applicant who has attended another United States academic or language school must also provide a Visa Clearance Form from the last school attended.

YSU enrolls students in accordance with the policy of the United States Immigration and Naturalization Service.

## REGISTRATION

### Advisement

Before initial registration the student must consult with the faculty member in charge of the program to which the student has been admitted, or with an assigned advisor, for advice in developing a program of study leading to the desired degree. The ultimate responsibility for selection of graduate courses, based upon the requirements of the student's program as set forth in the catalog, remains with the student. Continued consultation with the advisor is encouraged. Because of the nature of certain programs, an advisor may require consultation before each registration.

## Registration Procedure

New graduate students and those who are returning after more than four quarters' absence register in person by appointment from the Registrar's Office. Current graduate students receive registration materials by mail and have the option of registering by mail. Registration is concluded on or before the Late and Final Registration date published in the Schedule of Classes. Detailed information on registration is contained in the Schedule of Classes and in the directions for registration received with registration materials. Registration is not officially completed until all tuition and fees are paid.

## Change of Registration

A registered student who wishes to effect a schedule alteration must complete a Change of Registration form and present it to the Registrar's Office. A Change of Registration is not official until a student has paid the appropriate fee to the Bursar's Office.

No student may add a course for credit or audit after the seventh calendar day of the quarter or after the fifth calendar day of a summer term.

Withdrawal from a course must be accomplished through the Change of Registration procedure. Simple failure to attend class or notification to an instructor is insufficient. A grade of F will be recorded unless a student officially withdraws. If a student withdraws from one or more classes during the first two weeks of classes, no entry will be made on that student's permanent record for the withdrawn class(es).

## Complete Withdrawal of Registration

The student who wishes to withdraw from all classes in a particular quarter must follow the same procedure as in Change of Registration. If a student withdraws from all classes during the first two weeks of the quarter, no entry will be made on the student's academic record. The student who withdraws from all classes will automatically receive a permit to register for the subsequent four quarters.

## OTHER REGULATIONS

### Time Limit

All work (including transfer credits) offered in fulfillment of the minimum credit hour requirement for the degree must have been taken within the six-year period immediately preceding the date on which the last requirement is completed. When graduate study is interrupted by military service, the six-year limit may be extended.

### Graduate Courses

Courses in which graduate credit may be earned are of two types.

1) 900- and 1000-level courses, which are open to graduate students (see Graduate Courses for Undergraduates). At least one-half of the credits applied toward the degree must be earned in courses in the 900- and 1000-series.

2) Upper Division undergraduate courses (800-level) in which the student may enroll for graduate credit only with the approval of the advisor.

Only certain Upper Division undergraduate courses may be taken for graduate credit. Those that are in this category are listed in the Courses section of this catalog. To earn graduate credit in an Upper Division course the student must be admitted to the Graduate School before the course is taken. Graduate students in undergraduate courses which offer graduate credit may be expected to pursue the subject matter in greater depth than the undergraduate student. This may require additional work assignments.

A 700-level course may not be taken for credit toward the requirements of a graduate degree.



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### Seminar

A seminar is generally considered to consist of a group of advanced students studying a subject under a professor, each making some pertinent contribution and all exchanging results through informal lectures, reports, and discussions.

### Thesis

Certain programs accept or require a thesis as partial fulfillment of the requirements for the degree.

### Second Master's Degree

A student who has a master's degree from Youngstown State University and desires a second master's degree must earn a minimum of 18 quarter hours of credit in addition to the total that the student had when the requirements for the first degree were completed and must complete the requirements for another graduate program. Students with a master's degree from another university will be limited to a maximum of 12 quarter hours of transfer credit.

### Interrupted Enrollment

Students who interrupt their attendance for four or more quarters must apply for readmission as former students at least two weeks prior to late and final registration. Graduate students who have not attended for six years must also pay a readmission fee.

Graduate students who fail to take courses or otherwise to pursue their graduate education for a period of two years will be readmitted only under regulations in force at the time of reapplication.

### Academic Standards

A cumulative grade-point average of at least 3.0 (on a 4.0 scale) is required for graduation. All graduate credit courses taken at YSU are included in the grade-point average determination. (See Grading System for grades less than C.)

Good academic standing for graduate students is a cumulative grade-point average of at least 3.0 (on a 4.0 scale) for all graduate credit courses taken at YSU. Graduate students who are not in good standing in any given quarter may continue to take graduate work until required to withdraw from the graduate program.

### Full-Time Status

A full-time student is one carrying 9 or more hours for credit.

### Reduced Load for Employed Students

The Graduate School recommends that the employed student carry less than a full academic load as determined in consultation with the major advisor or graduate committee.

### Graduate Courses for Undergraduates

An undergraduate student who has senior standing and an unrecalculated grade point average of at least 2.7 and who does not require a full schedule to complete the baccalaureate degree requirements at Youngstown State University, may enroll in 900- and 1000-level courses for graduate credit, provided such enrollment does not cause the total schedule for the quarter to exceed 16 quarter hours. Before registering for courses the student must have the approval of the advisor, the instructor of each course, and the Dean of the Graduate School. The credit earned cannot be counted toward fulfillment of the requirements for a bachelor's degree, and may not be used for graduate credit at Youngstown State University until the student is admitted to the Graduate School and the credit is accepted by the department in which the student continues graduate work. The maximum amount of such credit that will be acceptable at Youngstown State University is 15 hours.

Permission to undergraduates to enroll in graduate courses for undergraduate credit will be granted only to students with proven exceptional academic ability; such permission will be based on a petition prepared by the student's major department containing a statement of criteria used to determine *exceptional* and approved by the department offering the course and the Dean of the Graduate School.

### Grading System

The following grading system is used in reporting a final evaluation of the work of graduate students in courses or thesis research: A, B, C, D, F. The grade point equivalents are 4, 3, 2, 1, and 0 respectively.

Grades of D and F carry no graduate credit but will be used to determine the student's grade-point average. Failure will normally be indicated by a D; a grade of F indicates that the student has not achieved even a minimum grasp of the essentials of the course; this grade can also result from failure to withdraw officially from a course (see Change of Registration, and Refund of Fees Upon Withdrawal). A student has the privilege of repeating a course once, but the repetition is treated merely as another course, along with the first, in calculating the student's grade-point average.

On petition by the student and concurrence of the advisor and program director, the graduate dean may approve for exclusion from the calculation of the student's grade-point average courses that do not apply to the current degree program.

A grade of I (incomplete) may be given to a student who does satisfactory work in a course but who, for reasons beyond the student's control and deemed justifiable by the teacher, does not complete all requirements for a course by the time grades are submitted. A written explanation of the reason for the I will be forwarded to the Registrar's Office for inclusion in the student's permanent record, with copies to the student, department chair, and the Graduate Dean. Until the I is converted, it will not be included in the calculation of the student's point average. An I may not be converted for the purpose of changing the grade-point average of a completed degree. An I may remain on the record for an unlimited period of time and without penalty, assuming it was appropriately given.

The grade of W will be given for all withdrawals properly processed during the third through sixth weeks of any quarter (or from the fifth calendar day through the third week of each 5-week summer term). (*Properly processed* describes withdrawals made in conformity with the instructions on the official Change of Registration form.) A grade of W does not appear on the student's academic record if withdrawal occurs before the end of the second week of classes. It does appear on the grade report received by the student, however. A withdrawal made after the three- or six-week period will be recorded as an F unless the withdrawal was the result of circumstances over which the student had no control as shown by evidence presented by the student in a petition to the Dean of the Graduate School. Any grade of F assigned because of absence may be reviewed upon petition to the Graduate Dean. Where withdrawals change the student's status from full-time to part-time, the student immediately forfeits any privileges contingent upon full-time status, and all interested parties who legally require it will be notified.

In the case of thesis work still in progress at the time grades for the quarter are to be reported, a PR may be reported in place of a conventional grade. This symbol indicates that the student is working in a manner which merits being allowed to continue, but does not indicate a specific quality of work. In the quarter when the work is completed, the instructor will report a grade that will apply to all the work done in the preceding quarter or quarters as well.

The PR grade may be used for students in certain courses other than thesis. However, PR grades awarded in non-thesis courses will revert to a grade of F after two academic quarters, not to include summer, beyond the normal ending date of the scheduled course.

Au signifies that the student was enrolled in the class as an auditor.

A graduate student may not elect to take a course under the credit/no credit option.

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### Grade Changes

Applications for grade changes must be completed by the instructor and must contain the signature of the Graduate Dean unless the change is from Incomplete (I) or Progress (PR). All grade changes must be submitted to the Records Office by the dean or instructor; they will not be accepted from the student. In no case may a grade be changed after a student has received a graduate degree for the purpose of changing the grade-point average of the completed degree.

### Change of Curriculum

A student must request in writing transfer from one graduate program to another. The transfer is complete when an advisor in the program to which the student is transferring has been appointed and has accepted the student as an advisee, and when the change has been reported to and approved by the Dean of the Graduate School. In such cases of transfer, courses taken in the original curriculum that also apply toward the degree in the new curriculum will be accepted. None of the credit hours or quality points earned in other courses in the original curriculum will be taken into account in the new curriculum. However, the student's academic record and grade-point average will reflect all graduate courses taken.

### Auditing Courses

A student may register for and attend any courses as an auditor. An auditor is not held responsible for the regular classwork, class attendance and preparation of assignments, and receives no credit for the course. The student pays the regular fees for the audit course, as well as any other applicable fees. Audit courses are carried in a student's load only for fee purposes. A student who has registered for a course for audit may not change that status to credit after the last day to add a class. An Au may be given only to a student who has begun a course as an auditor or who has changed status to that of auditor before six weeks of a regular quarter or three weeks of a split summer session have elapsed.

### Foreign Language Proficiency Examinations

The Department of Foreign Languages and Literatures administers proficiency examinations in the following languages: French, German, Italian, Latin, Russian and Spanish. The graduate student should consult the major department to learn specific degree requirements.

A grade of *pass* or *fail* on the proficiency examination will be registered with the Office of the Dean of the Graduate School.

It is not the responsibility of either the University or the Department of Foreign Languages and Literatures to tutor students for these examinations or to recommend tutors.

### Commencement

*Intention to Apply for Graduation.* At the beginning of the quarter prior to the quarter in which the degree is expected, the student must notify the Graduate School of intention to apply for graduation on a form provided for this purpose by the Graduate School, a copy of which will be sent to the student's major department.

*Formal Application for Graduation.* Formal application for graduation must be filed before 5:00 p.m. on the Monday following the first full week of the graduating quarter.

There are three graduation ceremonies each year: Winter Commencement, in March, at the end of the second quarter of the academic year; Spring Commencement, in June, at the end of the third quarter; and Summer Commencement, in August or September, at the end of the summer session. A student who completes the requirements for a degree at the end of the fall quarter receives the degree in December and is present, if at all possible, at the Winter Commencement.

## Student Rights, Responsibilities, and Conduct

In accordance with *The Code*, formal disciplinary sanction may be imposed by the University whenever student and/or group/organization behavior interferes with the University's responsibility to ensure a positive educational environment; or its subsidiary responsibilities for protecting the rights, health, and safety of persons in the University community; maintaining and protecting property; keeping accurate records; and providing necessary services and non-classroom activities.

In extraordinary circumstances, the President of the University may suspend a student and deny access to the University campus for a reasonable period of time pending consideration of the case. In event of acquittal, every consideration shall be given to the student for completion of academic work.

Copies of *The Code* are available in the office of the Vice President — Student Services, 203 Tod Hall.

## COSTS AND FEES

A schedule of current costs and fees has been inserted in this catalog as a supplemental sheet. Additional copies are available from the Graduate School.

The charges for graduate work depend upon whether the student is a full-time or part-time student and upon legal residency.

### Fees

*Tuition.* The sum of the Graduate Instructional Fee and the General Fee is the tuition for a student.

*Graduate Instructional Fee.* This charge is assessed all students each quarter. The rate is per academic quarter hour of credit of registration. This fee supplements the state subsidy and is a revenue of the University's Educational General Fund.

*Auditing Courses.* Students may audit courses (i.e., register to take a course without receiving credit). The fees are the same as if the course was taken for credit.

*General Fee.* This charge is also assessed all students each quarter and the rate depends upon the number of credits for which the student is registering. This fee covers non-instructional services such as Kilcawley Student Center, intercollegiate athletics, performing artists and lecture programs, intramural sports, student government, and the Career Services Office.

*Non-Resident Tuition Surcharge.* As noted above, all students pay the Instructional Fee and the General Fee. Those students who are not legal residents of Ohio must pay a tuition surcharge which is in addition to all other fees. The University does not receive State subsidy for non-resident undergraduate students; therefore, a surcharge is necessary to more nearly recover the cost of instruction for non-resident students.

*Performance Music Fee.* This fee is in addition to the regular instructional fee. It is assessed students taking music lessons and applies on a per-credit basis.

### Other Fees

*Application Fee.* Effective July 1, 1988, a non-refundable \$30 application fee must accompany the application for admission to the Graduate School. Once a student has paid the application fee, he/she shall not be recharged an application fee unless six or more years have elapsed since the student was last registered as a graduate student.

*Change of Registration Fee.* A fee is charged for changing a registration unless the change was caused by the University (e.g., a class is cancelled). This fee does not apply when a student withdraws from the University. Students making a change in registration which results in an



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increase in fees will receive a revised statement of the amount due. Failure to make payment within ten days of the date of the revision results in a penalty assessment equal to two-thirds of the late payment fee.

*Graduate Management Admission Test (GMAT) Fee.* The GMAT is an aptitude test designed to measure abilities important to the study of business at the graduate level. It is offered four times a year. Registration forms are available at the University Counseling and Testing Center.

*Graduate Record Examination Fee.* The aptitude portion of the Graduate Record Examination is administered on campus five times a year. Registration forms are available at the Counseling and Testing Center.

*Graduation Fee.* A fee is charged persons awarded a degree and is to be paid before the application for graduation is filed with the dean of the school or college awarding the degree. The fee covers the required academic attire (cap and gown) and the diploma. No reduction or waiver of the fee occurs for graduation in absentia or for use of non-academic attire. The fee applies for each degree granted except honorary degrees. This fee is nonrefundable.

*Late Payment Fee.* Payment of a bill after the due date results in assessment of a late payment fee. The graduate instructional fee, general fee, non-resident tuition, and applied music fee are due in full 10 days prior to the first day of scheduled classes for that term or as otherwise shown in the *calendar* or Schedule of Classes. All fees and charges billed must be paid and partial payment will not be accepted. This fee is also charged any student who registers after classes begin.

*Late Registration Fee.* A fee is charged a currently enrolled student who fails to register for the next term at the assigned time and later registers at the time assigned new or returning students.

*Parking Permit Fee.* A permit to park in YSU parking facilities will be issued to students and employees of the University upon payment of the fee. The fee is for the academic quarter and does not guarantee a parking space. Some facilities are restricted (e.g. for students only, or for faculty and staff only). The current Driving and Parking Regulations pamphlet and parking lot map should be consulted. A daily fee is charged anyone not having a permit who wishes to park in facilities designated for cash business. Persons other than employees and students who are on campus for a short period of time to conduct business may park in the Visitor's Lot on the corner of Spring and Bryson Streets (lot M8) if space is available. The parking permit fee is refundable only if the student withdraws and returns the permit access card. Any refund is prorated at the daily parking rate through the 18th day of the term.

*Proficiency Examination Fee.* A fee is charged for an examination provided by an academic department to determine a student's proficiency for some reason other than assignment of academic credit.

*Registration Withdrawal Fee.* A fee is charged a student who withdraws from all courses or who does not complete the registration process by payment of appropriate fees. This fee is nonrefundable.

### Services Charges

*Health and Physical Education Locker and Towel Fee.* Students enrolled in a class requiring locker, basket, or towel service in Beeghly Physical Education Center or the Sports Complex do not pay a fee. Other authorized persons pay a fee each academic quarter. Loss or damage to the lock or towel will result in assessment of a replacement charge.

*Identification Card Replacement Charge.* A charge is made for replacement of an ID card or a current term validation sticker which is to be affixed to the ID card.

**Residence Hall Charge.** University housing is available by the academic year. The residence contract includes room and 19 meals per week. In addition to the charge for service, a security deposit is required. Payment and refunds are as scheduled in the housing contract. Meal tickets are also available for students who are not residents of University-owned housing.

**Returned Check Charge.** A charge is made to anyone whose check or charge card is returned unpaid by the bank. Any late payment fee applicable is also assessed. Failure to pay billing of return check and/or charge within ten days and/or a second check/charge return will result in the University not accepting this type of payment at any of its collection points.

**Student Locker Charge.** A limited number of lockers are available in various buildings for the convenience of commuting students. Payment and assignments are made at the Kilcawley Information Center.

**Thesis Binding Charge.** A charge is made for each copy of a Master's thesis bound by the William F. Maag, Jr. Library.

**Transcript of Credits Charge.** A charge is made for each transcript issued. Transcripts will not be issued for students or alumni with outstanding debts owed the University. Only a student may order a transcript; however, students are cautioned that most graduate and professional schools and many employers accept transcripts only if sent directly by the University.

## Fines

**Parking Violation Fine.** Parking without a permit, parking in such a manner as to impede regular traffic flow, occupancy of more than one identified space (assuming lines are not obscured), and other offenses as identified in the Driving and Parking Regulations will result in issuance of a citation against the student responsible for the vehicle (e.g., student driving parents' car). Payment of a fine removes the citation; however, the fine is doubled if not paid within 10 days of issuance. Vehicles may be towed in certain cases. See the regulations.

**Library Fines.** Fines are assessed for failure to return books on time as stipulated or for the unauthorized removal of a reserved book. Willful damage or defacement of library materials or other property is a violation of State law and is punished as such.

## Refund of Fees Upon Withdrawal

To withdraw from a single course or from all courses it is necessary to complete a Change of Registration form and present it to the Bursar's Office; if the student withdraws from all courses, the YSU ID card must also be surrendered. Failure to attend class or notification to the instructor or other faculty or staff member does not constitute withdrawal. If a student is permitted to withdraw, a refund of the instructional fee, the general fee, the non-resident tuition surcharge, and the applied music fee, will be in conformity with the following schedule:

Date of Acceptance by Bursar	Academic Quarter	Summer Term
1st-6th day	75% of Fee	50% of Fee
7th-12th day	50% of Fee	No Refund
13th-18th day	25% of Fee	No Refund
19th day and thereafter	No Refund	No Refund

The schedule is figured from the opening day of classes and every day of the week is counted except Sunday. If a course is cancelled by the University, fees paid for that course will be refunded in full. If fees were paid by scholarship, loan, or grant-in-aid the appropriate credit will be issued to the fund from which the initial payment was made. Refunds are processed 15 days after withdrawal. If payment was made by personal check, refunds are processed 30 days from payment date.

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If a student withdraws for reasons beyond his or her control (e.g., illness, required military service, job transfer or shift change imposed by the employer) the fees will be refunded in direct proportion to the number of weeks attended. All requests for refund for these reasons must be documented and are processed only by mail on forms provided by the Bursar's Office. Address such correspondence to the YSU Fees & Charges Appeals Board, in care of the Bursar.

### Office Hours for Bursar and Student Financial Aids Office

#### When Classes are in Session:

Monday and Tuesday: 8 a.m. to 6:30 p.m. (first six weeks of the quarter)

Wednesday, Thursday, and Friday: 8 a.m. to 5 p.m.

Saturday: 9 a.m. to 12 noon

#### When Classes are not in session:

Monday through Friday: 8 a.m. to 5 p.m.

Saturday: closed

#### Summer

Monday and Tuesday: 8 a.m. to 6 p.m.

Wednesday, Thursday, Friday: 8 a.m. to 5 p.m.

Saturday: closed

The Bursar and Student Financial Aids Offices are also open by appointment during late and final registration and change of registration.

## STATE RESIDENCY STATUS

Place of residency for tuition purposes will be determined at the time of admission or readmission by the Director of Admissions, on the basis of the residency rules stated below and information supplied on the *Application for Admission* form.

If the student has any question about the appropriate classification, he/she should immediately bring it to the attention of the Director of Admissions for review. Retroactive refunds or charges may be made to any student improperly classified.

### Resident Status Appeal

Appeal for a change in residency classification should be made in writing to the Director of Admissions, who may require the student to complete an *Application for Non-Resident Tuition Surcharge Exemption* form. The Director's decision will be sent in writing to the student, who may then appeal the classification in a personal interview with the Director of Admissions.

The student may request the Director of Admissions to arrange an appearance before the Residence Classification Board. Such appearances ordinarily occur within two weeks of the request, if possible. The Residence Classification Board's appellate decision is final.

### Ohio Student Residency for State Subsidy and Tuition Surcharge Purposes

#### (A) Intent and Authority

(1) It is the intent of the Ohio Board of Regents in promulgating this rule to exclude from treatment as residents, as that term is applied here, those persons who are present in the State of Ohio primarily for the purpose of receiving the benefit of a state-supported education.

(2) This rule is adopted pursuant to Chapter 119 of the revised code, and under the authority conferred upon the Ohio Board of Regents by Section 3333.31 of the revised code.

#### (B) Definitions

For purposes of this rule:

(1) A *resident of Ohio for all other legal purposes* shall mean any person who maintains a twelve-month place or places of residence in Ohio, who is qualified as a resident to vote in Ohio and receive state welfare benefits, and who may be subjected to tax liability under

section 5747.02 of the revised code, provided such person has not, within the time prescribed by this rule, declared himself or herself to be or allowed himself or herself to remain a resident of any other state or nation for any of these or other purposes.

(2) Financial Support, as used in this rule, shall not include grants, scholarships and awards from persons or entities which are not related to the recipient.

(3) An Institution of Higher Education, as used in this rule, shall mean any university, community college, technical institute or college, general and technical college, medical college or private medical or dental college which received a direct subsidy from the State of Ohio.

(4) For the purpose of determining residency for tuition surcharge purposes at Ohio's state-assisted colleges and universities, *domicile* is a person's permanent place of abode; there must exist a demonstrated intent to live permanently in Ohio, and a legal ability under federal and state law to reside permanently in the state. For the purpose of this policy, only one domicile may be maintained at a given time.

(5) For the purpose of determining residency for tuition surcharge purposes at Ohio's state-assisted colleges and universities, an individual's immigration status will not preclude an individual from obtaining residency status if that individual has the current legal status to remain permanently in the United States.

### **(C) Residency Rules for Tuition Surcharge Purposes**

The following persons shall be classified as residents of the State of Ohio for tuition surcharge purposes:

(1) A dependent student, at least one of whose parents or legal guardian has been a resident of the State of Ohio for all other legal purposes for twelve consecutive months or more immediately preceding the enrollment of such student in an institution of higher education.

(2) A person who has been a resident of Ohio for the purpose of this rule for at least twelve consecutive months immediately preceding his or her enrollment in an institution of higher education and who is not receiving, and has not directly or indirectly received in the preceding twelve consecutive months, financial support from persons or entities who are not residents of Ohio for all other legal purposes.

(3) A dependent child of a parent or legal guardian, or the spouse of a person who, as of the first day of a term of enrollment, has accepted full-time employment and established domicile in the State of Ohio for reasons other than gaining the benefit of favorable tuition rates.

Documentation of full-time employment and domicile shall include both of the following documents:

(a) A sworn statement from the employer or the employer's representative on the letterhead of the employer or the employer's representative certifying that the parent or spouse of the student is employed full-time in Ohio.

(b) A copy of the lease under which the parent or spouse is the lessee and occupant of rented residential property in the State; a copy of the closing statement on residential real property located in Ohio of which the parent or spouse is the owner and occupant; or if the parent or spouse is not the lessee or owner of the residence in which he or she has established domicile, a letter from the owner of the residence certifying that the parent or spouse resides at that residence.

### **(D) Additional Criteria Which May Be Considered in Determining Residency for the Purpose May Include But Are Not Limited to the Following:**

(1) Criteria evidencing residency:

- (a) If a person is subject to tax liability under section 5747.02 of the revised code;
- (b) If a person qualifies to vote in Ohio;
- (c) If a person is eligible to receive state welfare benefits;
- (d) If a person has an Ohio driver's license and/or motor vehicle registration.



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### (2) Criteria evidencing lack of residency:

(a) If a person is a resident of or intends to be a resident of another state or nation for the purpose of tax liability, voting, receipt of welfare benefits, or student loan benefits (if the student qualified for that loan program by being a resident of that state or nation);

(b) If a person is a resident or intends to be a resident of another state or nation for any purpose other than tax liability, voting, or receipt of welfare benefits (see paragraph (D)(2)(a) of this rule).

### (E) Exceptions to the General Rule of Residency for Tuition Surcharge Purposes:

(1) A person who is living and is gainfully employed on a full-time or part-time and self-sustaining basis in Ohio and who is pursuing a part-time program of instruction at an institution of higher education shall be considered a resident of Ohio for these purposes.

(2) A person who enters and currently remains upon active duty status in the United States military service while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile.

(3) A person on active duty status in the United State Military Service who is stationed and resides in Ohio and his or her dependents shall be considered residents of Ohio for these purposes.

(4) A person who is transferred by his or her employer beyond the territorial limits of the fifty states of the United States and the District of Columbia while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile as long as such person has fulfilled his or her tax liability to the state of Ohio for at least the tax year preceding enrollment.

(5) A person who has been employed as a migrant worker in the State of Ohio and his or her dependents shall be considered a resident for these purposes provided such person has worked in Ohio at least four months during each of the three years preceding the proposed enrollment.

### (F) Procedures

(1) A dependent person classified as a resident of Ohio for these purposes under the provisions of section (C) (1) of this rule and who is enrolled in an institution of higher education when his or her parents or legal guardian removes their residency from the state of Ohio shall continue to be considered a resident during continuous full-time enrollment and until his or her completion of any one academic degree program.

(2) In considering residency, removal of the student or the student's parents or legal guardian from Ohio shall not, during a period of twelve months following such removal, constitute relinquishment of Ohio residency status otherwise established under paragraph (C)(1) or (C)(2) of this rule.

(3) Any person once classified as a nonresident, upon the completion of twelve consecutive months of residency, must apply to the university for reclassification as a resident of Ohio for enrollment if such person in fact wants to be reclassified as a resident. Should such person present clear and convincing proof that no part of his or her financial support is or in the preceding twelve consecutive months has been provided directly or indirectly by persons or entities who are not residents of Ohio for all other legal purposes, such person shall be reclassified as a resident.

Evidentiary determinations under this rule shall be made by the University which may require, among other things, the submission of documentation regarding the sources of a student's actual financial support.

(4) Any reclassification of a person who was once classified as a nonresident for these purposes shall have prospective application only from the date of such reclassification.

(5) The university, in reporting student enrollment to the Ohio Board of Regents for the purpose of assessing the tuition surcharge, shall provide individual students with a fair and adequate opportunity to present proof of his or her Ohio residency for purposes of this rule. The university may require the submission of affidavits and other documentary evidence which it may deem necessary to a full and complete determination under this rule.

## ASSISTANTSHIPS, SCHOLARSHIPS, AND LOANS

### Financial Aid

Loans and on-campus employment are available to graduate students enrolled in degree programs at YSU.

Applications for student loans are available in the Scholarships and Financial Aid Office, Jones Hall 2013. Applications for on-campus employment are available in the Career Services Office, Jones Hall 3025.

### Scholarships

The Youngstown State University Foundation makes money available to provide scholarships and grants to eligible graduate students.

An application must be submitted for each quarter for which a scholarship or grant-in-aid is sought. Applications for a given quarter will not be accepted earlier than the first day of classes of the preceding quarter. The deadline for applying is 5:00 p.m. on the fifteenth day of classes (Monday through Friday) of the preceding quarter. Whenever there are more eligible applicants than funds available, awards will be made on the basis of grade-point average. Applications received after the deadline will normally not be considered.

Minimum GPA's, application deadlines, award levels, and eligibility criteria are subject to change without notice.

Detailed information on scholarships and grants is available in the Graduate School office.

*Warren P. Williamson, Jr. Fellowships* were created in 1987. Five fellowships are to be awarded each year to eligible Youngstown State University MBA students. Recipients of the fellowships are determined by the Williamson School of Business Administration's Admission/Retention Committee. Eligible individuals are outstanding students with a baccalaureate degree from an accredited institution who have been admitted to the MBA program with regular status. Financial need may also be considered. Fellowship holders may attend either full- or part-time. Each fellowship is a \$5,000 award, approximately \$4,000 for tuition and \$1,000 for fees and books. Applications are available in the Graduate School office and from the MBA Coordinator.

*The Earl E. Edgar Memorial Scholarship Fund* was established in 1980 by friends and family of the late Dr. Earl E. Edgar, Vice President for Academic Affairs at Youngstown State University. This scholarship provides an annual \$500 award to a graduate student at YSU studying the Humanities. Selection of the recipient will be based on financial need and academic excellence. The selection committee is comprised of the Deans of the Graduate School and the College of Arts and Sciences.

### Assistantships

Applications for assistantships must be accompanied or preceded by application for admission to the Graduate School. First-year international graduate students with superior credentials and/or prior academic study in the United States may apply for graduate assistantships.

The assistantship program is predicated on the idea that graduate students, when given an opportunity to assist the faculty, not only provide a service to the institution, but also gain valuable experience through this work in association with the faculty. Appointments to assistantships are made by the Graduate Dean only upon recommendation by the department concerned.

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In those instances in which the student indicates acceptance of an assistantship award prior to April 15, the student may not accept another appointment without first obtaining formal release for this purpose.

Graduate assistants may be assigned to instructional, research, and/or other academic duties as determined by the department in which the assistant is appointed and as approved by the Dean of the Graduate School.

Those assigned to classroom or laboratory duties are under the direct supervision of a full-service faculty member who will retain full responsibility for the maintenance of high academic and pedagogical standards. The University will assess the oral English language proficiency of all teaching assistants before duties are assigned.

Research assignments afford the assistant the opportunity to participate in authorized faculty or University research programs.

Normally, assistantships are awarded for a period of three quarters beginning with the fall quarter. To remain eligible for the assistantship, an appointee must discharge his/her duties satisfactorily and maintain good academic standing. An appointee must maintain enrollment in at least 21 quarter hours of degree credit course work for the regular academic year, and not fewer than six quarter hours of degree credit course work for any one quarter. (With the advisor's approval, course work that is not part of the graduate assistant's degree program may be counted toward the 21 quarter hour minimum for the assistantship.) Approval to carry more than 12 quarter hours or fewer than six quarter hours in any quarter must be obtained from the department concerned and the Graduate Dean. Graduate assistants shall not hold other regular employment, whether full- or part-time, but may accept occasional or temporary work subject to the approval of the department chair or the graduate supervisor of the department.

Each assistantship carries a stipend and remission of instructional fees, including the nonresident tuition surcharge and music performance fees. It does not cover such other expenses as the general fee, or charges for parking permits. The same remission will be applicable for the summer quarter, up to twelve quarter hours, for those who have held an assistantship during each of the three preceding quarters.

Further information on assistantship stipends may be obtained from the Graduate School.

### GRADUATE STUDENT REPRESENTATION

Within the first month of the fall term, the Graduate Council representative from each school (college) which houses a graduate degree program will make sure that a graduate student from that school is designated to serve on the Graduate Student Advisory Committee (GSAC). All graduate students will have the opportunity to volunteer to be on this committee. If two or more graduate students file petitions, each signed by 15 or more graduate students, an election shall be held. These petitions must be filed by the 12th day of classes (fall term); for this purpose, Saturday is a day of classes. If fewer than two file such petitions, the representative will be appointed from among those who volunteer. Each appointment must be ratified by Council. The Council shall designate one of its members to be advisor to the GSAC.

Those eligible to be members of GSAC will be full-time graduate students (as defined in the Graduate Catalog), graduate assistants, or part-time students who shall have completed 12 or more hours of graduate credit, excluding transfer credit, prior to the fall term in which the representatives are chosen.

The GSAC will choose from its own membership:

- 1) a graduate student member of Graduate Council
- 2) a graduate student member to serve on each of the following graduate committees: Policy; Curriculum; Scholarships, Assistantships, and Awards.

The GSAC will recommend to Council three graduate-student members of the grievance committee, at least one of whom comes from GSAC.

Graduate students serving on graduate committees shall be voting members of the committees on which they serve. Members of GSAC have the right to participate in graduate faculty meetings without vote.

Vacancies in GSAC will be filled by Graduate Council. A vacancy will occur automatically if a student representative resigns his/her position or if he/she is not registered for courses carrying graduate credit. The GSAC may request Council to declare a vacancy if the student is delinquent in his/her duties. If there are no available students from a given school, the Council may fill the vacancy with a student from another school.

## GRADUATE STUDENT GRIEVANCE PROCEDURE

The Graduate Student Grievance Procedure provides the graduate students at Youngstown State University with a formal channel through which complaints concerning academic matters may be heard. Details and appropriate forms are available in the Graduate School office.

## COURSE NUMBERING SYSTEM, ABBREVIATIONS, AND REFERENCE MARKS

It is important that the student be familiar with the course numbering system and its significance, and with the abbreviations used to indicate the amount of credit.

*Course Numbering.* Courses listed in this bulletin are of two types. Courses in the 800-series are Upper Division undergraduate courses in which the graduate student may enroll for graduate credit with the approval of the advisor. Courses in the 900- and 1000-series are graduate-level courses normally open only to graduate students (but which undergraduates may elect under conditions outlined in Graduate Courses for Undergraduates).

*Abbreviations.* The abbreviation *q.h.* at the end of a course description stands for *quarter hours of credit*. Thus, credit for a three quarter course may be indicated by the notation 3 + 3 + 3 *q.h.*, meaning *three quarter hours of credit each quarter*.

*Prereq.* stands for *prerequisite*.

*Hyphen.* A hyphen between numbers (e.g. 833-834-835) indicates that credit is not given toward graduation for the work of the first and second quarters until the work of the third quarter is completed, except when special permission is granted by the chair of the department in which the course is given. The first quarter of such a course is prerequisite to the second and the second quarter prerequisite to the third.

*Comma.* Ordinarily, a comma between numbers (e.g., 841, 842, 843) indicates that the course extends throughout the year, but that credit toward graduation is given for each course individually.

## GRADUATE PROGRAMS

### MASTER OF ARTS

#### ECONOMICS

Yih-Wu Liu

*In Charge of Graduate Studies in Economics*

328 DeBartolo Hall

(216) 742-1674

#### Admission Requirements

Admission to the program requires the applicant to hold a baccalaureate degree from a recognized college or university, to have achieved an unrecalculated cumulative grade-point average of at least 2.5 (on a 4.0 scale), and to have completed 21 quarter hours (or its equivalent) in economics, or preparation judged satisfactory by the department. These courses must include Principles of Economics and one course in statistics.

#### Degree Requirements

Core course requirements are Introduction to Mathematical Economics, Econometrics, Microeconomics I and II, and Macroeconomics I and II. Graduate credit electives may be taken in the social and applied sciences, and humanities, with the consent of the advisor.

A comprehensive examination in economic theory must be taken by the student. It is recommended that this examination be scheduled as soon as possible after completion of the core course requirements and prior to completion of 36 hours of graduate work. To be eligible for the comprehensive examination, the student must have a scholastic average of not less than 3.0 (B). The comprehensive examination may not be taken more than twice. A student who has successfully passed the comprehensive examination pursues one of the following options for graduation:

- Option A: The student must complete a minimum of 45 quarter hours of graduate course work.
- Option B: The student must complete a minimum of 45 quarter hours of graduate course work including a master's thesis. The maximum amount of credit that may be earned for the thesis is nine quarter hours. The thesis must be submitted according to the general requirements established by the Graduate School. The student is required to defend the thesis in an oral examination before a committee of three or more faculty members of the department.

#### ENGLISH

Clyde T. Hankey

*In Charge of Graduate Studies in English*

212 DeBartolo Hall

(216) 742-1635

#### Admission Requirements

Students must have an undergraduate English major or other preparation judged satisfactory to the department.



### Degree Requirements

1) Students must complete 48 hours in courses at the graduate level; exceptions must have the approval of the department. Students choose one of the following options:

**General Option:** At least one course each drawn from those Areas, I through V, in which the student has not taken at least two undergraduate courses.

**Special Option:** Program to be chosen and designed by the student, and approved by a committee of the graduate faculty chaired by the Graduate Coordinator.

- 2) English 900 is required of all candidates for the M.A. degree in English. This course should be taken either during the first quarter of graduate work or the first time the course is offered thereafter.
- 3) Students who enter without having taken an undergraduate linguistics course must take at least one linguistic studies course.
- 4) Students must submit satisfactory (*B* or better) seminar papers to two different instructors.

### Advising

- 1) All candidates for the degree must have their schedules approved by the Graduate Coordinator every quarter.
- 2) Students who anticipate graduate study beyond the M.A. are strongly advised to acquire basic reading competence in at least one foreign language.

### HISTORY

Saul S. Friedman

*In Charge of Graduate Studies in History*

528 DeBartolo Hall

(216) 742-3458

### Admission Requirements

Students must have an unrecalculated grade-point average in undergraduate study of at least 2.75 (on a 4.0 scale) and a minimum of 24 quarter hours of study in the field of history as an undergraduate (this may be waived upon petition to the Department of History).

### Degree Requirements

The Department of History offers two options to candidates for a Master of Arts Degree in History. Option I is designed for those students who wish to continue their studies toward a doctorate. Option II is primarily designed to meet the needs and improve the effectiveness of secondary teachers.

#### Option I

- 1) A total of 45 quarter hours at the 900-level, including thesis (9 q.h.).
- 2) All students must take a course in Historiography (949 American or 950 European) and Historical Research (948).
- 3) Sixteen quarter hours of course work shall be in a field of concentration, exclusive of thesis credit.
- 4) A thesis is required of all candidates.
- 5) General written and oral examinations must be passed by all candidates.
- 6) Students working in American or British history will, in most instances, not be required to pass a foreign language examination. In areas where a foreign language is essential for research, the student will have to meet the requirement set by the department.



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### Option II

- 1) A total of 48 quarter hours of course work at the 900-level.
- 2) All students must take a course in Historiography (949 American or 950 European) and Historical Research (948).
- 3) Sixteen quarter hours of course work shall be in a field of concentration.
- 4) Students must submit two satisfactory (B or better) graduate seminar papers to two different instructors. The two research papers are to be deposited with the graduate program director to remain on file permanently.
- 5) General written and oral examinations have to be passed by all candidates.
- 6) Foreign language examination is not required.

Students under Option I are reminded that the Department of History expects that the thesis shall display a capacity for research in a variety of historical sources, the ability to interpret factual information, and shall constitute a properly documented report of the completed research.

Before any student under Option I is allowed to take the written and oral examinations, the advisor will designate to the chair of the Graduate Committee of the Department of History which foreign language, if any, the student is required to know and how this requirement has to be met.

Each candidate for the Master of Arts in history must pass a written and an oral examination in the major field of concentration. The primary purpose of these examinations is to determine the student's mastery of the major field; the examination will require factual and interpretative material as well as bibliography and historiography.

## MASTER OF BUSINESS ADMINISTRATION

James S. Cicarelli

*Dean of the Williamson School of Business Administration*

Linda J. Mohn

*MBA Coordinator*

507 Williamson Hall

(216) 742-3069

### Admission Requirements

The MBA program is open to all qualified men and women who show promise of success in graduate business study. Prior academic work in business subjects is not required for admission into the program, but students with subject-matter deficiencies will be required to take the necessary background courses as part of their program (see below). The basis for admittance to graduate study in business is an index score of at least 950 points based on the formula:  $200 \times$  undergraduate grade average (4.0 system) plus GMAT total score; or at least 1,000 points using the last 90 quarter hours (or 60 semester hours) of upper-division or post-bachelor academic work to determine the grade average in the above formula.

*Regular Admission.* Requirements for regular admission to the program are: (1) a baccalaureate degree from an accredited institution with an unrecalculated GPA of 2.7 or above, and (2) satisfactory completion of the GMAT with a score of 450 or more.

*Provisional Admission.* Individuals who obtain a satisfactory index score for regular admission but do not meet the GPA or GMAT minimum requirements will be accepted provisionally. Individuals who do not obtain a satisfactory index score but feel they are otherwise qualified may petition the MBA Admissions and Standards Committee. All persons must complete formal application requirements before petitioning for provisional admission.

### Degree Requirements

There are three levels of course work in the MBA program (Level I — foundations; Level II — core; and Level III — concentration and electives). A student entering with undergraduate business administration and economics course work can receive waiver of Level I course hours. The total number of hours required to complete the MBA program can consist of 53 to 99 quarter hours of credit, depending upon Level I coursework required. Students must take Level I courses prior to Levels II and III. Level II courses must be completed prior to completing Level III courses. Exceptions to this sequence must be approved by the MBA Coordinator.

Students who receive three grades of C or less, or otherwise do not maintain a 3.0 grade-point average, may, upon the recommendation of the MBA Admissions and Standards Committee, be dropped from the program. This policy applies to courses taken in levels I, II, or III after acceptance into the MBA program.

### Level I: MBA Foundations Courses

Level I courses are required of students who do not have the necessary undergraduate background in business and economics. Each student's transcript will be evaluated to determine the course work equivalencies. All Level I courses taken after admission to the MBA program must be completed with a minimum grade point average of 3.0 prior to taking Level II courses.

The Level I foundations course requirements are:

Acct. 900	Financial Accounting for Management (or Acct. 605, 606 or equivalent, 10 q.h.)	5 q.h.
Acct. 610	Microcomputer Applications in Business (or equiv.)	4 q.h.
Fin. 900	Foundations of Finance (or Fin. 720 or equivalent, 4 q.h.)	3 q.h.
Econ. 900	Statistical Problems (or Econ. 624, 705 or equivalent, 8 q.h.)	4 q.h.
Econ. 901	Basic Economic Analysis (or Econ. 520, 621 or equivalent, 7 q.h.)	5 q.h.
Mgmt. 604	Legal Environment of Business I (or equivalent)	4 q.h.
Mgmt. 900	Foundations of Management (or Mgmt. 725 or equivalent, 4 q.h.)	3 q.h.
Mktg. 900	Foundations of Marketing (or Mktg. 703 or equivalent, 5 q.h.)	3 q.h.
Total Foundations		31 — 46 q.h.

### Level II: MBA Core Courses

Acct. 902	Management Accounting Systems	or	3 q.h.
Acct. 930	Accounting Theory*		4 q.h.
Fin. 921	Financial Management		4 q.h.
Econ. 926	Aggregate Economics for Business Decision Making		4 q.h.
Mktg. 942	Marketing Administration		4 q.h.
Mgmt. 915	Research Methodology		4 q.h.
Mgmt. 916	Quantitative Analysis for Business Decisions		4 q.h.
Mgmt. 921	Operations Management I (prereq.: Mgmt. 916)		4 q.h.
Mgmt. 961	Organizational Behavior (prereq.: Mgmt. 915)		4 q.h.
Mgmt. 965	Business Policies (prereq.: all other core courses)		4 q.h.
Mgmt. 971	Business and Society		4 q.h.

\*Accounting majors and undergraduate accounting majors who earned their degree within the last five years must take Accounting 930.

Total Core 39 — 40 q.h.

### Level III: Concentration and Elective Courses

The student may choose one of the three areas of concentration in the MBA program: Finance, Management, or Marketing. Students choosing an area of concentration must take a minimum of 14 q.h. in their area of concentration. Students who do not choose a concentration must

take a minimum of 14 q.h. of elective courses. The electives are to be chosen by the student, in consultation with the MBA Coordinator. These courses may cover advanced work in a basic discipline of an operational field; they may consist of courses offered by the School of Business Administration; or they may be combined with related disciplines in other schools or departments in the University. Graduate courses taken outside the School of Business need prior written approval by the MBA Coordinator stating the relationship of the course(s) to the student's MBA program in order to be counted as MBA electives. The thesis option is available in each area of concentration. Any student considering the thesis option must consult with the MBA Coordinator. Optimally, the student desiring the thesis option should be working with an advisor on topic selection before the core courses are completed. Students wishing to change their concentration after acceptance must follow the curriculum in force at the time the change is made.

Total Concentration and Elective Hours Required — 14 q.h.

**Total MBA hours required — 53 q.h.**

## MASTER OF MUSIC

Darla J. Funk

*In Charge of Graduate Studies in Music*

3144 Bliss Hall

(216) 742-1829

The following programs of study lead to the degree Master of Music: performance, music theory and composition, music history and literature, and music education.

### Admission Requirements

Applicants for admission to graduate study in the Master of Music degree must present a baccalaureate degree in music from an accredited college or university. Admission requires an unrecalculated undergraduate grade-point average of at least 2.7 (on a 4.0 scale). Students with less than a 2.7 average must provide satisfactory scores on the aptitude portion of the Graduate Record Examination. Upon admission, and prior to the end of the first quarter of graduate study, each student must take a placement examination in music history and music theory. Failure to do so will result in an addition of 6 q.h. to the 48 q.h. degree program (3 q.h. in music theory, 3 q.h. in music history). All performance degree applicants must audition on their principal instrument for acceptance to the appropriate applied music level. Students with a major in voice performance are expected to have completed eight quarter hours each in French, German, and Italian, or the equivalent.

### Degree Requirements

- 1) Candidates for the degree Master of Music must complete all requirements outlined in their respective courses of study (see chart below).
- 2) Candidates must meet whatever undergraduate foreign language requirements are appropriate to their major. Music history and literature majors must pass a written examination in at least one foreign language, preferably French or German, prior to initiating thesis research.
- 3) Students who fail to meet the standards set by the School of Music may, upon recommendation of the Dana Graduate Committee, be required to withdraw at the end of the quarter.
- 4) A final qualifying examination is required of all candidates for the Master of Music. For thesis students the examination will be included in the thesis defense which shall be conducted by a committee composed of three graduate faculty members, one of whom will be from outside the student's major area; the thesis committee shall be appointed by the student's advisor when the thesis proposal is accepted by the Graduate Committee. Performance majors will submit a document supporting the recital. Music education majors electing the non-thesis option will take the music education exit examination. Procedural regulations governing the final qualifying examination are available from the office of the faculty member in charge of graduate studies in music.

- 5) Thesis students who have completed 990, 991, Thesis I and II (3 + 3 q.h.) and have completed all course requirements, but have not defended the thesis are required to maintain current student status if they expect to receive advisor or committee assistance, or utilize University services, e.g., library, computer, parking, etc. This can be accomplished by registering for one hour of Music 991.

**Requirements for the Degree Master of Music**

<i>Performance</i>		<i>Music History</i>	
900-level Applied	18 q.h.	Music History (B)	21 q.h.
942 or 973	3 q.h.	942 or 973	3 q.h.
Music History (B)	6 q.h.	Music Theory (A)	6 q.h.
Music Theory (A)	6 q.h.	800- or 900-level Applied	6 q.h.
Music Literature (E)	3-4 q.h.	Thesis 990, 991	6 q.h.
Pedagogy (D)	2-4 q.h.	Music Electives (A-F)	6 q.h.
Music Electives (A-F)	7-9 q.h.	Total	48 q.h.
Total	48 q.h.		
		<i>Music Education</i>	
		Music Education (C)	12 q.h.
		970, 978	6 q.h.
		942 or 973	3 q.h.
		Music History (B)	6 q.h.
		Music Theory (A)	6 q.h.
		800- or 900-level Applied	6 q.h.
		Music Electives (A-F)	9 q.h.
		Total	48 q.h.

**Music Theory & Composition**

Music Theory (A)	21 q.h.
942 or 973	3 q.h.
Music History (B)	6 q.h.
800- or 900-level Applied	6 q.h.
Thesis 990, 991	6 q.h.
Music Electives (A-F)	6 q.h.
Total	48 q.h.

- (A) Courses to be selected from List A  
 (B) Courses to be selected from List B  
 (C) Courses to be selected from List C  
 (D) Courses to be selected from List D  
 (E) Courses to be selected from List E  
 (F) May include up to 3 q.h. of ensemble courses and up to 6 additional quarter hours of applied music courses. Selection is subject to results of entrance placement examination in music theory and music history. All music electives must be approved by advisor.

**Music Theory & Composition (A)**

830 Materials of 20th Century Music	3 q.h.
831 Counterpoint 1	3 q.h.
832 Counterpoint 2	3 q.h.
833 Theory Seminar	3 q.h.
840 Instrumentation	4 q.h.
904, 905, 906 Advanced Composition	4 q.h.
910 Music Styles 1	3 q.h.
911 Music Styles 2	3 q.h.
912 Music Styles 3	3 q.h.

**Music History (B)**

830 Materials of 20th Century Music	3 q.h.
871 Baroque	3 q.h.
872 18th Century and the Viennese Classical School	3 q.h.
873 Opera History	3 q.h.
874 19th Century: The Romantic Period	3 q.h.
878 Selected Topics in Music History	3 q.h.
940 Music in the Middle Ages	3 q.h.
941 Music in the Renaissance	3 q.h.
943 Seminar in Musicology	3 q.h.

**Music Education (C)**

814	Selected Topics in Music Education	2 q.h.
841	Music Workshop	1-4 q.h.
970	Foundations of Music Education	3 q.h.
971	Admin. and Supervision in Music Education	3 q.h.
972	Seminar in Music Education	3 q.h.
974	Psychology of Music	3 q.h.
975	Music and the Humanities	3 q.h.
976	Directed Study in Conducting	3 q.h.
977	Comparative Music Education	3 q.h.
978	Contemporary Trends in Music Education	3 q.h.
981	Elementary School Music Practicum	3 q.h.
982	Secondary School Music Practicum	3 q.h.

**Pedagogy (D)**

851	Woodwind Pedagogy	2 q.h.
858, 859	Piano Pedagogy	2+2 q.h.
880	Vocal Pedagogy	2 q.h.
882	String Pedagogy	2 q.h.
885	Brass Pedagogy	2 q.h.
913	Pedagogy of Theory	3 q.h.

**Music Literature (E)**

852	Woodwind Literature	3 q.h.
860	Piano Literature	4 q.h.
869	Organ Literature	3 q.h.
879	Vocal Literature	3 q.h.
884	History and Literature of Brass Instruments	3 q.h.

**Music Electives (F)**

820, 821, 822	Composition Minor	2+2+2 q.h.
834, 835	Electronic Music	2+2 q.h.
840	Instrumentation	4 q.h.
887, 888, 889	Piano Duet & Duo Playing	1+1+1 q.h.
890, 891, 892	Chamber Music with Piano	1+1+1 q.h.
920, 921, 922	Seminar in Materials of Music	3+3+3 q.h.
942	Introduction to Music Bibliography	3 q.h.
973	Research Methods & Materials	3 q.h.
990	Thesis 1	3 q.h.
991	Thesis 2	3 q.h.
992	Independent Projects	1-6 q.h.

**MASTER OF SCIENCE****BIOLOGICAL SCIENCES**

Robert E. Leipheimer

*In Charge of Graduate Studies in Biological Sciences*

4039 Ward Beecher

(216) 742-7122

**Admission Requirements**

Admission to the Graduate program in biology leading to the Master of Science degree requires a baccalaureate degree from an accredited college or university, an undergraduate record



showing a cumulative grade point average of at least 2.5 (on a 4.0 scale), and satisfactory completion of at least 25 quarter hours of undergraduate biology (or equivalent) courses, plus organic chemistry and introductory physics.

### Degree Requirements

A minimum of 45 quarter hours of credit is required for the Master of Science degree. Students must earn a passing grade on a comprehensive written examination, pass an oral review of the candidate by the departmental graduate committee, and submit an acceptable thesis reporting the results of a research project. Students may repeat Biology 990 (Thesis) to a maximum of 15 quarter hours. An additional 15 quarter hours is required at the 900-1000 level. All students must take at least one quarter hour of Biology 988, and achieve a minimum grade-point average of 3.0 for graduation.

The student's course of study will be devised during a consultation with a departmental counselor and will be approved by the departmental graduate faculty. The course of study will be based on the student's area of specialization, background, and career interests.

### Advisement

All students in the biological sciences graduate program must have their course schedules approved by the graduate advisor every quarter.

## CHEMISTRY

Thomas N. Dobbelstein  
*Chair of the Department*  
5053 Ward Beecher Hall  
(216) 742-3663

### Admission Requirements

An applicant for admission to the Master of Science degree program in the Department of Chemistry must present an undergraduate major in chemistry, or the equivalent. Ordinarily this entails the completion of at least a year's study in both organic and physical chemistry. In those cases where the undergraduate preparation is slightly deficient, the applicant may be admitted with provisional status, with the approval of the chair of the Department and the Dean of the Graduate School.

### Degree Requirements

A minimum of 45 quarter hours of credit is required including at least 36 quarter hours of courses other than Chemistry 990. Each student must take 1 q.h. Chemistry 998 and each of the following core courses: Chemistry 911, 931, 941, and 951. The total course work in Chemistry must be at least 36 quarter hours and must include at least 9 quarter hours in one concentration area and 6 quarter hours, exclusive of the core courses, outside that concentration area. Chemistry concentration areas are: Analytical, Biochemical, Biomedical, Clinical, Inorganic, Organic, Physical, and Polymer Chemistry. A list of courses in each concentration area is available from the department. All students must achieve a grade-point average of 3.0 or higher in Chemistry courses and must complete an acceptable thesis for graduation.

### Advisement

Each entering student will be assigned a temporary advisor. The student should select a thesis advisor, who will assist the candidate in planning the remainder of the program, by the time 18 quarter hours of graduate studies have been completed.

## CRIMINAL JUSTICE

A. Bari Lateef  
*Chair of the Department*  
2087 Cushwa Hall  
(216) 742-3279

### Admission Requirements

While an undergraduate degree in this discipline is not required for admission, a substantial background in the social sciences is preferred. Students lacking such preparation will, at the discretion of the department, be required to make up deficiencies. Each student must complete the equivalent of the Youngstown State University criminal justice undergraduate core and an introductory course each in research methodology and statistics. A student admitted with deficiencies in any of these requirements must remove them prior to completion of the second quarter of graduate coursework.

Requirements for admission on regular status:

- 1) A bachelor's degree from an accredited college or university and;
- 2) An unrecalculated cumulative grade-point average in undergraduate work of at least 2.7 overall or a 3.0 in the last 60 q.h. of work. This is based on a 4.0 scale.

or

An unrecalculated cumulative grade-point average in undergraduate work of at least 2.5 on a 4.0 scale and a combined Graduate Record Examination Score of 1000 on the general aptitude test or 50 on the Miller Analogies Test.

Requirements for admission on other than a regular basis are covered in this bulletin under provisional admission.

Upon admission to the Criminal Justice graduate program and selection of emphasis area, each student is guided by a committee of three faculty members. The student selects a graduate advisor in the area of concentration from among the faculty of the department of criminal justice. This advisor serves as the chair of the student's graduate committee. The student and advisor select the other two members of the committee, both of whom must be members of the graduate faculty, and one of whom may come from a department other than criminal justice. This committee will assist the student as appropriate with the planning of the program, preparation and oral defense of the thesis, or administration of the comprehensive examination in the case of the non-thesis option.

### Degree Requirements

The graduate program in criminal justice adheres to the position that the administration of criminal justice is a continuous integrated process from prevention of crime through completion of all legal intervention. The program is designed to provide society with individuals who have both a substantial awareness of the overall system and the essential competencies required to perform professional roles within it. To achieve this objective the program broadens the student's knowledge of the total criminal justice process and provides professional education so that its graduates may assume positions of leadership within the criminal justice system.

Students seeking the M.S. degree in Criminal Justice may elect either a thesis or non-thesis option, with the exception of emphasis area A, which is thesis only.

### Thesis Option

A minimum of 45 quarter hours credit is required in this option, of which nine are Thesis. No more than 12 may be below the 900-level.

### Non-Thesis Option

A minimum of 52 quarter hours credit is required, of which no more than one-third may be below the 900 series. A written comprehensive examination is also required and may not be taken until the student has completed seventy-five percent of the coursework.

The graduate curriculum consists of two major components: (1) study in the major substantive areas of criminal justice, normally met by completing the graduate core of 910, 915, 920, and 925. Any departure from this requires prior approval of the graduate coordinator. (2) Concentrated study in one of three emphasis areas which prepares students for professional positions within the American system of Criminal Justice. Each student is required to choose emphasis area A, B, or C during the first quarter of enrollment in the graduate program. All electives are selected by the student in consultation with the advisor, subject to the approval of the graduate coordinator.

### Emphasis Area A: Criminal Justice Program Planning and Evaluation

This area is designed to provide skills in action program planning and evaluation in the criminal justice setting. The requirements are 940, 945, 960, and a thesis.

### Emphasis Area B: Police Management

This area is designed to provide individuals with the necessary academic and professional competencies for middle management and executive positions in police organizations. The required courses are 970, 971, and 972.

### Emphasis Area C: Correctional Administration and Treatment

This area is designed to develop academic and professional competency in the area of corrections. The required courses are 980, 981, and 982.

## MATHEMATICAL AND COMPUTER SCIENCES

John J. Buoni

*In Charge of Graduate Studies in Mathematics and Computer Science*

1088 Cushwa Hall

(216) 742-1971

The master's degree in mathematics is awarded to qualified students satisfactorily completing a composite of courses, seminars and research activities aimed at increasing students' depth of understanding of and proficiency in mathematics so that they may be able:

- 1) to use mathematics and computer science in industry,
- 2) to improve their subject matter competency as high school teachers,
- 3) to teach mathematics and computer science at the two-year college level, and/or
- 4) to pursue further graduate study.

### Admission Requirements

- 1) A baccalaureate degree from an accredited college or university.
- 2) An unrecalculated undergraduate cumulative grade-point average of at least 2.7 (on a 4.0 scale) in all undergraduate mathematics and computer science courses.
- 3) Preparation judged satisfactory by the Department of Mathematical and Computer Sciences. Study in theoretical analysis and algebraic structures is required as part of the preparation. Students with slight deficiencies may be admitted with provisional status with the approval of the Director of Graduate Studies in the Department of Mathematical and Computer Sciences and the Dean of the Graduate School.

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### Degree Requirements

- 1) A minimum of 45 quarter hours of credit.
- 2) A cumulative grade point average of at least 3.0.
- 3) The student's combined undergraduate-graduate program must include studies in algebra, analysis, topology and applied mathematics.
- 4) Satisfactory performance on a comprehensive examination is required. This may be written and/or oral, at the discretion of the department.
- 5) A student who prefers to write a thesis must first obtain the approval of his thesis topic from the graduate mathematics faculty and the department chair. Thesis credit of six quarter hours may be earned under Mathematics 999 or Computer Science 999. These hours may be counted as part of the 45 quarter hours required for the degree. The student will be expected to make a successful oral defense of the thesis.
- 6) Before completing 15 quarter hours, the student must submit, through an advisor, the entire degree program for approval by the graduate mathematics faculty and the department chair.

### Computer Science Option

This option is available for students who wish to complement the traditional mathematics program with additional background in computer science and modern applied mathematics. Of the 45 quarter hours required, at least 16 must be in mathematics and at least 16 in computer science.

## MASTER OF SCIENCE IN EDUCATION

David P. Ruggles  
*Dean of the School of Education  
and Coordinator of Graduate Studies in Education*  
1054 Fedor Hall  
(216) 742-3215

The programs leading to the degree Master of Science in Education have the approval of the National Council for Accreditation of Teacher Education (NCATE) through September 1, 1992. These programs are designed to prepare elementary and secondary teachers, elementary and secondary principals, elementary and secondary supervisors, and school guidance counselors at the master's degree level.

### Graduate program directors are:

Janet L. Beary  
*Chair of the Department of Elementary Education and Reading*  
Master Teacher — Elementary; Master Teacher — Secondary, Reading  
(216) 742-3251

James E. Douglass  
*In Charge of Graduate Studies in the Department of Secondary Education*  
Master Teacher — Secondary; Educational Administration and Supervision  
(216) 742-3263

Ronald J. Richards  
*Chair of the Department of Counseling*  
Counseling  
(216) 742-3257

Jack D. Dunsing  
 Chair of the Department of Special Education  
 Special Education  
 (216) 742-3265

**Admission Requirements**

To be admitted to the Master of Science in Education degree program, the applicant must have earned a bachelor's degree from an accredited college or university. In general, the applicant must also have:

- 1) qualified for a teaching certificate (Ohio provisional or equivalent) if enrolled in a program leading to additional certification, validation, or endorsement. A program faculty may admit students on an individual basis to graduate programs leading to certification in certain areas which are graduate level only;
- 2) an unrecalculated undergraduate cumulative grade-point average of at least 2.5 (on a 4.0 scale);
- 3) adequate preparation for the graduate program in which the student wishes to enroll, as specified by the department of the major; and
- 4) a satisfactory score on the Aptitude Test of the Graduate Record Examination or on the Miller Analogies Test.

**Degree Requirements**

In general, the programs provide for 1) a core of foundation courses, 2) required courses in the major discipline, 3) elective courses in the program being undertaken, and 4) additional work outside the School of Education. A minimum of 48 quarter hours is required for the degree in each program.

A comprehensive examination at the close of the Foundations portion of the work will be required as a basis for becoming a degree candidate in special education and secondary education, with the exception of master teacher secondary — reading. Majors in counseling, elementary education and master teacher secondary — reading, must pass a comprehensive examination in their major area of study.

**Foundations of Education**

Students in all programs are required to take courses in foundations of education as indicated in the various degree program description. However, students in the counseling program who are not seeking state certification in school guidance have no course requirements in foundations of education; they may take courses in foundations according to their individual needs. The offerings and descriptions of the various courses of the Foundations of Education Department are provided in the *Courses* section of this bulletin.

**The Master Teacher Program — Elementary**

**Option A: Curriculum**

- 1) Required courses for specialization (21 quarter hours)
 

Ed. 909	Supervision of Student Teachers — Elementary	3 q.h.
Ed. 916	The Elementary School Curriculum	3 q.h.
Will serve as prerequisites to the following sequence of courses:		
Ed. 917	Elementary School Reading Programs	3 q.h.
Ed. 918	Elementary School Mathematics Programs	3 q.h.
Ed. 919	Social Studies Programs in Elementary School	3 q.h.
Ed. 920	Elementary School Science Programs	3 q.h.
Ed. 921	Issues, Problems and Developments in Elementary Education	3 q.h.
- 2) Foundations of Education (12 quarter hours). (Take at any point in the program.)
 

Ed. 872	Statistical Methods in Education	3 q.h.
Ed. 905	History of American Education	3 q.h.
Ed. 901	Philosophical Foundations of Educational Theory & Practice	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.



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- Ed. 904 Education Research (Prereq.: Ed. 872) 3 q.h.
- 3) Electives in elementary education may be chosen from any of the graduate elementary education course offerings.
- 4) 6-18 quarter hours of courses from humanities, sciences, and other disciplines, including Psychology 903.
- 5) All master teacher curriculum students will be required to take a comprehensive examination in their major area of study.

### **Option B: Reading Specialist**

- 1) Required courses for specialization (22-23 quarter hours). The following courses should be taken in sequence:
- |         |  |             |
|---------|--|-------------|
| Ed. 882 | Developmental and Content Area Reading           | 3 q.h.      |
| Ed. 917 | Elementary School Reading Programs (3) or        |             |
| Ed. 883 | Secondary School Reading (4)                     | 3 or 4 q.h. |
| Ed. 924 | Diagnosis and Treatment of Reading Disability 1  | 4 q.h.      |
| Ed. 925 | Diagnosis and Treatment of Reading Disability II | 4 q.h.      |
| Ed. 927 | Practicum: Reading                               | 4 q.h.      |
| Ed. 930 | Supervision of Reading                           | 4 q.h.      |
- 2) Cognate Area (10-11 quarter hours)
- |            |                                 |             |
|------------|---------------------------------|-------------|
| Psych. 903 | Psychology of Learning          | 3 q.h.      |
| Psych. 907 | Psychology of Adjustment (3) or |             |
| Psych. 802 | Personality (4)                 | 3 or 4 q.h. |
| Engl. 918  | Children's Literature           | 4 q.h.      |
- 3) Foundations of Education (12 quarter hours). See description of requirement under Option A.
- 4) Electives: 2-4 quarter hours.
- 5) All master teacher reading students will be required to take a comprehensive examination in reading after the completion of Ed. 930.

### **Option C: Early Childhood Specialist**

- 1) Required courses for specialization (23 quarter hours)
- |         |   |        |
|---------|---|--------|
| Ed. 916 | The Elementary School Curriculum                    | 3 q.h. |
| Ed. 911 | Early Childhood Programs                            | 3 q.h. |
| Ed. 912 | Curriculum and Methods in Early Childhood Education | 4 q.h. |
| Ed. 913 | Pre-School Education                                | 3 q.h. |
| Ed. 914 | Practicum in Early Childhood Education              | 4 q.h. |
| Ed. 929 | Language Arts in Primary Grades                     | 3 q.h. |
| Ed. 946 | The Supervision of Instruction                      | 3 q.h. |
- 2) Cognate area (6 quarter hours)
- |            |                               |        |
|------------|-------------------------------|--------|
| Psych. 903 | Psychology of Learning        | 3 q.h. |
| Coun. 825  | Group Processes in the School | 3 q.h. |
- 3) Foundations of Education (12 quarter hours). See description of requirement under Option A.
- 4) Suggested electives (7 quarter hours)
- |            |                              |        |
|------------|------------------------------|--------|
| Psych. 906 | Human Growth and Development | 3 q.h. |
| Soc. 902   | Child and Society            | 4 q.h. |
| Engl. 918  | Children's Literature        | 4 q.h. |
- 5) All master teacher early childhood students will be required to take a comprehensive examination over required courses for specialization.

### **Option D: Middle Grades**

- 1) Required courses for specialization (16 quarter hours)
- |          |   |        |
|----------|---|--------|
| Ed. 938  | Early Adolescence Characteristics and Educational Program Needs (prereq.: Psych. 906) | 4 q.h. |
| Ed. 939  | Designing Middle Grade Environments, Curricula, and Instruction (prereq.: Ed. 938)    | 3 q.h. |
| Ed. 1043 | Field Experience/Middle Grades  | 3 q.h. |

and Ed. 940	Introduction to Middle Grade Math and Science Curriculum and Instruction (prereq.: Ed. 938) and	2 q.h.
Ed. 941	Methods of Teaching Math and Science in Middle Grades (prereq.: Ed. 940)	4 q.h.
or Ed. 942	Introduction to Middle Grade Language Arts, Reading, and Social Studies (prereq.: Ed. 938) and	3 q.h.
Ed. 943	Methods of Teaching Middle Grades Language Arts, Reading, and Social Studies (prereq.: Ed. 942)	3 q.h.
2) Cognate area (9 q.h.)		
Psych. 906	Human Growth and Development	3 q.h.
Coun. 825	Group Processes in the School	3 q.h.
Ed. 922	Principles of Instruction or	
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
3) Foundations of Education (9 q.h.)		
Ed. 935	Philosophical Foundations of Middle Grade Education	3 q.h.
Ed. 937	Sociological Foundations of Middle Grade Education (prereq.: Ed. 935)	3 q.h.
Ed. 904	Educational Research (prereq.: Ed. 872 or equivalent)	3 q.h.
4) Electives — teaching area or process		14 q.h.

**Educational Administration**

Candidates for any administrative certificate must have completed the degree of Master of Science in Education — Educational Administration as required by Youngstown State University, or its equivalent thereof, as evaluated by the Department of Educational Administration. Requirements for this degree are:

1) Foundations & Learning Theory (12 quarter hours)		
Psych. 903	Psychology of Learning	3 q.h.
Psych. 906	Human Growth & Development	3 q.h.
Ed. 904	Educational Research	3 q.h.
Ed. 901	Phil. Found. of Ed. Theory & Practice or	3 q.h.
Ed. 902	Social-Cultural Aspects of Education or	3 q.h.
Ed. 905	A History of American Education	3 q.h.
2) Administrative Core (21 quarter hours)		
Ed. 949	School Law	3 q.h.
Ed. 952	School Finance	3 q.h.
Ed. 954	School Community Relations	3 q.h.
Ed. 955	Staff Personnel Administration	3 q.h.
Ed. 978	Supervision and Administration in Special Education	3 q.h.
Ed. 1021	Field Experience I*	3 q.h.
Ed. 1031	Theories of Educational Administration	3 q.h.
*Admission to Field Experience I may be granted only by the chair of the Educational Administration Department and after completion of a minimum of 18 q.h. and a maximum of 30 q.h. The minimum must include: Ed. 1036, Ed. 1031, Ed. 946, Ed. 949, Ed. 955, and Ed. 904.		
3) Curriculum and Supervision (15 quarter hours)		
Ed. 889	Small Computer Applications in the Classroom	3 q.h.
Ed. 946	The Supervision of Instruction	3 q.h.
Ed. 951	Interpersonal Communication for Administrators	3 q.h.
Ed. 961	Introduction to Pupil Personnel Services	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
4) Special Notes		

A comprehensive examination covering the 21 q.h. Administrative Core must be successfully completed after these 21 q.h. are finished and prior to granting of the degree.

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This program provides no certification in administrative areas. Upon completion of the basic Master of Science in Education — Educational Administration degree, or the equivalent thereof as evaluated by the Department of Educational Administration, enrollment in the following specific certification fields\* may be permitted:

- Elementary Principalship
- Secondary Principalship
- Educational Administrative Specialist
- Assistant Superintendent
- Superintendent or Local Superintendent

\*Completion of the minimum number of quarter hours indicated for each program, and any other Ohio State Department of Education requirements must be achieved prior to recommendation for any certificate.

All transfer students, including those seeking a Master's degree and those who hold the Master's degree, will be evaluated using the criteria listed above. Students who have been evaluated through direct contact with the Ohio State Department of Education should be aware that they must meet the criteria established by the Department of Educational Administration at YSU before the M.S. in Educational Administration will be granted.

These requirements must be fully completed before a student may be placed in any administrative certification program.

### Certification Requirements for Elementary Principalship

Completion of Educational Administration degree and twenty-five (25) quarter hours as listed below and any other Ohio State Department of Education requirements.

Ed. 916	The Elementary School Curriculum	3 q.h.
Ed. 947	Basic Prin. of Elementary School Administration	3 q.h.
Ed. 950	School Business Management	3 q.h.
Ed. 816	Diagnosis & Remediation of Elem. School Mathematics	3 q.h.
Ed. 881	Corrective Techniques in Reading	4 q.h.
Ed. 988	Evaluation of Educational Institutions	3 q.h.
Ed. 908	Computer Applications for Administrators	3 q.h.
Ed. 1022	Field Experience II*	3 q.h.

### Certification Requirements for Secondary Principalship

Completion of Educational Administration degree and twenty-one (21) quarter hours listed below and any other Ohio State Department of Education requirements.

Ed. 931	The Secondary School Curriculum	3 q.h.
Ed. 948	Basic Principles of Secondary School Administration	3 q.h.
Ed. 950	School Business Management	3 q.h.
Ed. 988	Evaluation of Educational Institutions	3 q.h.
Ed. 934	Diagnostic-Prescriptive Education	3 q.h.
Ed. 908	Computer Applications for Administrators	3 q.h.
Ed. 1022	Field Experience II*	3 q.h.

\*Field Experience II requires completion of the above sequence of courses and the permission of the chair of the Department of Educational Administration.

### Certification Requirements for Educational Administrative Specialist

Provisional certificate for an educational administrative specialist will be issued to the holder of a master's degree in Educational Administration, or the equivalent thereof, with sixty-eight (68) quarter hours of graduate work including the following courses:

#### **Business Management**

Ed. 1031	Theories of Educational Administration	3 q.h.
Ed. 950	School Business Management	3 q.h.
Ed. 956	Educational Facilities	3 q.h.
Ed. 1041	Field Experiences in School Plant Planning	3 q.h.
Acct. 900	Financial Accounting for Management	5 q.h.

Acct. 902	Management Accounting Systems	3 q.h.
Ed. 952	School Finance	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
Ed. 1024	Seminar: Collective Bargaining	3 q.h.
Econ. 946	Theory of State and Local Finance	3 q.h.
Ed. 1022	Field Experience II (concentration in School Business Management)	3 q.h.

**Educational Research**

Ed. 872	Statistical Methods in Education	3 q.h.
Ed. 904	Educational Research	3 q.h.
Coun. 964	Measurement and Assessment Techniques	3 q.h.
Coun. 965	Applied Testing in Career Counseling	3 q.h.
Ed. 923	Review of Reading Research	4 q.h.
Ed. 954	School Community Relations	3 q.h.
Ed. 932	Theory and Practice in Evaluation Research	3 q.h.
Ed. 933	Proposal Writing in Education	4 q.h.
Ed. 953	Philosophy of and Knowledge in Educational Research	3 q.h.
Ed. 980	Advanced Statistical Methods in Education	3 q.h.
Ed. 998	Field Experience in Educational Research	3 q.h.

**Educational Staff Personnel Administration**

Ed. 1030	Human Relations Training for School Personnel	3 q.h.
Ed. 1031	Theories of Educational Administration	3 q.h.
Ed. 946	Supervision of Instruction	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
Ed. 951	Interpersonal Communication for Administrators	3 q.h.
Ed. 955	Staff Personnel Administration	3 q.h.
Ed. 959	Law for Classroom Teachers	3 q.h.
Ed. 921	Issues, Problems and Developments in Elementary Education	3 q.h.
Ed. 909	Supervision of Student Teachers — Elementary	3 q.h.
Ed. 910	Supervision of Secondary Schools	3 q.h.
Ed. 1032	Theories of Supervision	3 q.h.
Ed. 1024	Seminar: Collective Bargaining	3 q.h.
Ed. 1038	Planned Field Experience for Staff Personnel Administration	3 q.h.

**Instructional Services**

Ed. 1031	Theories of Educational Administration	3 q.h.
Ed. 946	The Supervision of Instruction	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
Ed. 916	The Elementary School Curriculum	3 q.h.
Ed. 931	The Secondary School Curriculum	3 q.h.
Ed. 959	Law for the Classroom Teacher	3 q.h.
Ed. 988	Evaluation of Educational Institutions	3 q.h.
Ed. 934	Diagnostic-Prescriptive Education	3 q.h.
Ed. 933	Proposal Writing in Education	4 q.h.
Ed. 1037	Planned Field Experience in Instructional Services	3 q.h.

**Pupil Personnel Administration**

Ed. 969	Administration of Personnel and Guidance Services	3 q.h.
Ed. 955	Staff Personnel Administration	3 q.h.
Ed. 1030	Human Relations Training for School Personnel	3 q.h.
Ed. 1009	School Counseling Internship	6-12 q.h.
Ed. 949	School Law	3 q.h.
Ed. 959	Law for the Classroom Teacher	3 q.h.

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### **School and Community Relations**

Ed. 1031	Theories of Educational Administration	3 q.h.
Ed. 946	The Supervision of Instruction	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
Ed. 954	School Community Relations	3 q.h.
Ed. 921	Issues, Problems & Developments in Elementary Education	3 q.h.
Ed. 951	Interpersonal Communications for Administrators	3 q.h.
Ed. 1030	Human Relations Training for School Personnel	3 q.h.
Ed. 915	Critiques on Contemporary Education	3 q.h.
Ed. 911	Early Childhood Programs	3 q.h.
Ed. 905	A History of American Education	3 q.h.
Ed. 984	Educational Programs for Handicapped Children	3 q.h.
Ed. 1039	Planned Field Experience — School & Community Relations	3 q.h.

### **Special Education (Exceptional Children)\***

Ed. 976	Academic Assessment & Remediation in Special Education	3 q.h.
Ed. 978	Supervision and Administration in Special Education	3 q.h.
Ed. 979	Assessment and Remediation of Language and Cognitive Process Dysfunctions in Special Education	3 q.h.
Ed. 981	Seminar in Special Education	3 q.h.
Ed. 983	Major Concepts in Special Education	3 q.h.
Ed. 984	Educational Programs for Handicapped Children	3 q.h.
Ed. 985	Resource Rooms & Supplemental Services for Special Ed.	3 q.h.
Ed. 986	Severe Behavior Handicaps: Assessment & Classroom Mgmt.	3 q.h.
Ed. 989	Educational Assessment of Gifted and Talented	4 q.h.
Ed. 1022	Field Experience II	3 q.h.

\*Candidate must be certified in an area of Special Education with 25 q.h. selected from the Special Education courses listed above.

### **Certification Requirements for Assistant Superintendency**

Completion of Educational Administration degree, principal's certification, 33/40 quarter hours listed below and any other Ohio State Department of Education requirements.

Ed. 947	Basic Principles of Elementary School Administration	or	3 q.h.
Ed. 948	Basic Principles of Secondary School Administration		3 q.h.
Ed. 908	Computer Applications for Administrators		3 q.h.
Ed. 988	Evaluation of Educational Institutions		3 q.h.
Econ. 946	Theory of State and Local Finance		3 q.h.
Ed. 950	School Business Management		3 q.h.
Ed. 956	Educational Facilities		3 q.h.
Ed. 916	The Elementary School Curriculum	or	3 q.h.
Ed. 931	The Secondary School Curriculum		3 q.h.
Ed. 934	Diagnostic-Prescriptive Education	or	3 q.h.
Ed. 816	Diagnosis & Remediation of Elementary School Math	and	3 q.h.
Ed. 881	Corrective Techniques in Reading		4 q.h.

Any two of the following:

Ed. 905	A History of American Education	3 q.h.
Ed. 901	Philosophical Foundations of Educational Theory & Practice	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Ed. 1022	Field Experience II*	3 q.h.

\*This field experience requires the completion of the sequence of courses listed above and the permission of the chair of the Department of Educational Administration.

### **Certification Requirements for Superintendent**

Must hold an administrative certificate issued upon the recommendation of YSU or the equivalent thereof as evaluated by the Department of Educational Administration at YSU. Completion of a *minimum* total of ninety (90) quarter hours, including all appropriate prerequisite



courses as determined by the Department of Educational Administration, and the following course sequence and any other Ohio State Department of Education requirements.

Econ. 946	Theory of State and Local Finance	3 q.h.
Ed. 956	Educational Facilities	3 q.h.
Ed. 1024	Seminar: Collective Bargaining	3 q.h.
Ed. 1035	The Superintendency	3 q.h.
Ed. 1041	Field Experiences in School Plant Planning	3 q.h.

Any two of the following three Foundations courses:

Ed. 905	A History of American Education	3 q.h.
Ed. 901	Philosophical Foundations of Educational Theory & Practice	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Ed. 1023	Field Experience III*	3 q.h.

\*This field experience requires the completion of the sequence of courses above and a permit from the chair of the Department of Educational Administration.

### The Master Teacher Program — Secondary

#### Option A: Subject Area Concentration

- 1) Foundations of Education
 

Ed. 900	Seminar in History of the Educ. of Children and Youth	or 3 q.h.
Ed. 905	A History of American Education	3 q.h.
Ed. 901	Philosophical Found. of Educational Theory & Practice	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Ed. 904	Educational Research*	3 q.h.

\*Students having an inadequate background in measurements or statistics may be required to take Ed. 872 as a prerequisite to Ed. 904.

- 2) Psych. 903 Psychology of Learning 3 q.h.  
Ed. 910 Supervision in Secondary Schools 3 q.h.
- 3) Twenty-four (24) quarter hours in appropriate teaching areas (art, biology, business education, chemistry, economics, English, French, geography, German, health and physical education, history, home economics, Italian, mathematics, music, physics, political science, Spanish, speech and dramatics, social studies, and sociology). In addition to consulting with an education advisor, the student will consult with a faculty member in the teaching area to determine the sequence of teaching area courses, which the student will place on file in the Department of Secondary Education.
- 4) Electives in teaching areas or professional education courses (6 q.h.). Recommended:  
Ed. 931 The Secondary School Curriculum 3 q.h.
- 5) Comprehensive examination over Foundations of Education

#### Option B: Curriculum and Improvement of Instruction

- 1) Foundations of Education (6 quarter hours)
 

Ed. 900	Seminar in History of the Education of Children and Youth	3 q.h.
Ed. 901	Philosophical Foundations of Educational Theory & Practice	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Ed. 904	Educational Research*	3 q.h.
Ed. 905	A History of American Education	3 q.h.
Ed. 1000, 1001, 1002, 1003, 1004	Seminar in Foundations of Education	3 q.h.
- 2) Curriculum and Instruction (12 quarter hours)
 

Ed. 883	Secondary School Reading	4 q.h.
Ed. 889	Small Computer Applications in the Classroom	3 q.h.
Ed. 922	Principles of Instruction*	3 q.h.
Ed. 931	The Secondary School Curriculum* or	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development*	3 q.h.
Ed. 934	Diagnostic-Prescriptive Education	3 q.h.

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|--|---|----------|
| 3) Related Areas (12 quarter hours)                                      |   |          |
| Psych. 903   | Psychology of Learning*                         | 3 q.h.   |
| Ed. 959  | Law for the Classroom Teacher*                  | 3 q.h.   |
| Ed. 946  | The Supervision of Instruction                  | 3 q.h.   |
| Ed. 951  | Interpersonal Communications for Administrators | 3 q.h.   |
| Ed. 954  | School Community Relations                      | 3 q.h.   |
| 4) Special Education (3 quarter hours)                                   |   |          |
| Ed. 802  | Education of Exceptional Children               | 4 q.h.   |
| Ed. 983  | Major Concepts in Special Education             | 3 q.h.   |
| 5) School Guidance (3 quarter hours)                                     |   |          |
| Coun. 825  | Group Processes in the School                   | 3 q.h.   |
| Coun. 961  | Introduction to Pupil Personnel Services        | 3 q.h.   |
| Coun. 1006   | Guidance in the Classroom                       | 3 q.h.   |
| Coun. 1017   | Group Procedures in Counseling                  | 3 q.h.   |
| 6) Electives in Teaching Area or Process (12 quarter hours)              |   |          |
| 7) Thesis (6-12 quarter hours optional, may be applied toward electives) |   |          |
| Ed. 999  | Thesis  | 3-8 q.h. |
| 8) Comprehensive examination covering:                                   |   |          |
| Ed. 931  | The Secondary School Curriculum <i>or</i>       |          |
| Ed. 1036   | Fundamentals of Curriculum Development          |          |
| Psych. 903   | Psychology of Learning                          |          |
| Ed. 904  | Educational Research                            |          |
| Ed. 922  | Principles of Instruction                       |          |

Students are encouraged to take the comprehensive exam early in the program. The exam will be administered by the Department of Secondary Education. All seminars must be approved *in advance* by the program advisor.

\*required course

### Certification Requirements for Supervisor

Applicants for a supervision certificate must have a master's degree, three years of teaching experience under a standard certificate, and the courses listed below.

Psych. 903	Psychology of Learning	3 q.h.
Psych. 906	Human Growth & Development	3 q.h.
Ed. 904	Educational Research	3 q.h.
Ed. 901	Philosophical Found. of Educ. Theory & Practice <i>or</i>	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Ed. 889	Small Computer Applications in the Classroom	3 q.h.
Ed. 922	Principles of Instruction	3 q.h.
Ed. 1036	Fundamentals of Curriculum Development	3 q.h.
Ed. 934	Diagnostic-Prescriptive Education	3 q.h.
Ed. 946	The Supervision of Instruction	3 q.h.
Ed. 978	Supervision and Administration in Special Education <i>or</i>	3 q.h.
Ed. 802	Education of Exceptional Children <i>or</i>	4 q.h.
Ed. 983	Major Concepts in Special Education	3 q.h.
Ed. 916	The Elementary School Curriculum <i>or</i>	3 q.h.
Ed. 931	The Secondary School Curriculum	3 q.h.
Ed. 1021	Field Experience I	3 q.h.
Ed. 951	Interpersonal Communications for Administrators	3 q.h.
Ed. 954	School Community Relations	3 q.h.
Ed. 959	Law for the Classroom Teacher <i>or</i>	3 q.h.
Ed. 949	School Law	3 q.h.

## Counseling Program

The Department of Counseling has as its objective the preparation of professional counselors for schools, colleges, and community mental health agencies. Therefore, the core courses required are those considered to represent basic knowledge and skills essential for professional counselors in all three settings. The common core includes courses in the following: professional orientation, counseling theory, counseling skills, career counseling, group counseling, measurement, research, and consultation. In addition, students are required to take coursework in behavioral foundations, field studies, given speciality courses and in an internship of their particular area of concentration. This program follows guidelines established by the American Association for Counseling and Development for school, community, and higher education student services counseling. The Community Counseling and School Counseling options are accredited by the Council for the Accreditation of Counseling and Related Educational Programs (CACREP). School Counseling is also accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the Ohio Department of Education. The programs also meet the basic coursework requirements for Ohio Counselor licensure. In addition, the department offers a post-masters sequence of study (see below) which meets coursework requirements for Ohio Clinical Counselor licensure (Licensed Professional Clinical Counselor).

### **Option A: School Counseling**

The school counseling program meets the education requirements for school counselor certification in the State of Ohio. Students seeking Ohio school counselor certification, however, must also hold a valid teaching certificate, have three years classroom teaching experience and pass the standardized school counseling specialty portion of the National Teacher Exam administered by Educational Testing Service.

Students seeking school counselor certification in other states, such as Pennsylvania, have the responsibility to insure that they meet the requirements of that particular state.

### **Option B: Community Counseling**

Community counselors are employed in a variety of settings, such as mental health facilities, community centers, crisis intervention agencies, courts, alcohol and drug treatment programs, hospitals, etc. A six to nine month internship is required to complete the program. (See syllabus for Counseling Internship 1010.)

### **Option C: Higher Education Student Services**

Many colleges and universities employ professional counselors for student personnel programs. This field of employment is quite diverse and requires a wide range of professional counseling skills. In addition to core requirements, coursework in higher education student programs, issues, and problems along with a full quarter of internship are required in this program option. (See syllabus for Counseling Internship 1005.)

## Admission Requirements

All applicants to the counseling degree program must have appropriate undergraduate preparation. Normally, this would include sufficient coursework in psychology and sociology. Every applicant will be interviewed by the Counseling Admissions Committee and must meet the standards prescribed by the department in the document *Department of Counseling Admission Policies* (revised March, 1986). The counseling admissions standards exceed the minimum standards set by the Graduate School and the School of Education. Hence, it is important that all applicants obtain a copy of the admissions policies from the Department of Counseling prior to making formal application for admission.

### Degree Requirements

After completing a minimum of 24 quarter hours of graduate coursework, students are required to take the Counseling Comprehensive Exam. Acceptable performance on the exam is necessary for continuation in the program.

It is important to note that in the curriculum given below 12 — 18 quarter hours of internship are required in each program option. Since this requirement entails 20 to 40 hours per week at the internship site, students who are employed full time may need to arrange for leaves of absence with their employers to fulfill this requirement. Required coursework for the M.S. in Education degree with a Counseling major is a minimum of 72 q.h. Completion of this program normally requires two years of full-time study (9-12 q.h.) over a period of six to eight quarters.

#### Program Option A: School Counseling

##### 1) Foundations — 12-15 quarter hours required

Foundations requirements are determined in accordance with the student's interests and program needs. The courses will normally be distributed over the following areas from among the courses listed or others approved by the department chair.

##### *Sociological, Historical and Philosophical Foundations*

Ed. 901	Philosophical Foundations of Educ. Theory & Practice*	3 q.h.
Phil. 815	Existentialism	4 q.h.
Ed. 900	Seminar in History of the Educ. of Children and Youth	3 q.h.
Ed. 905	A History of American Education	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Soc. 902	Child and Society	4 q.h.
Coun. 976	Social & Cultural Issues in Counseling*	3 q.h.

##### *Research Foundations*

Ed. 904	Educational Research*	3 q.h.
Coun. 968	Applied Research and Development in Counseling	3 q.h.

##### *Behavioral Foundations*

Psych. 903	Psychology of Learning	3 q.h.
Psych. 906	Human Growth and Development*	3 q.h.
Psych. 907	Psychology of Adjustment	3 q.h.

\*required foundations courses

##### 2) Core Counseling Courses — 26 quarter hours required

Coun. 960	Guidance and Counseling Professional Orientation	1 q.h.
Coun. 962	Counseling: Principles, Theory, Practice	3 q.h.
Coun. 964	Measurement and Assessment Techniques	3 q.h.
Coun. 972	Career Counseling	4 q.h.
Coun. 973	Group Counseling Theory	3 q.h.
Coun. 973A	Group Counseling Practice	3 q.h.
Coun. 975	Counselor Consultation	3 q.h.
Coun. 1011	Clinical Counseling Practice I	3 q.h.
Coun. 1012	Clinical Counseling Practice II	3 q.h.

##### 3) Cognate Area — 6-12 quarter hours required

Coun. 961*	Introduction to Pupil Personnel Services	3 q.h.
Coun. 963*	Occupational and Educational Information in Guidance	3 q.h.
Coun. 974*	Case Studies in School Guidance	3-6 q.h.
Coun. 1030	Human Relations Training for School Personnel	3 q.h.

\*required cognate courses

Additional or substitute cognate course work will be developed by the student and his/her advisor with the approval of the department chair. The cognate area should be developed in accordance with certification requirements, the student's interests and needs, and the availability of relevant coursework.

- 4) Internship — 12 quarter hours required  
 Coun. 1009 School Counseling Internship 6-12 q.h.
- 5) Electives — 3-9 quarter hours. To be approved by the student's advisor. Required coursework for the M.S. in Education degree with a major in school counseling is a minimum of 72 q.h.

**Program Option B: Community Counseling**

- 1) Foundations — 12-15 quarter hours required  
 The behavioral foundations area stresses a theoretical base considered essential to the counselor's effectiveness in community counseling. Even though credit earned in appropriate Upper Division courses (junior and senior level) will be considered adequate coursework in the respective foundations areas, all students will be required to earn a minimum of nine graduate credits in applied research, human growth and development and social and cultural issues related to counseling. However, students who have not completed relevant undergraduate coursework in the behavioral sciences will be required to complete more than 12 hours of graduate credit in foundations areas. Specific coursework for each student should be developed in cooperation with his/her advisor.

Coun. 976	Social and Cultural Issues in Counseling*	3 q.h.
Coun. 968	Applied Research and Development in Counseling*	3 q.h.
Psych. 802	Personality	4 q.h.
Psych. 828	Physiological Psychology	4 q.h.
Psych. 903	Psychology of Learning	3 q.h.
Psych. 906	Human Growth and Development*	3 q.h.
Psych. 907	Psychology of Adjustment	3 q.h.
Psych. 950	Survey of Personality Assessment	3 q.h.
Soc. 902	Child and Society	4 q.h.

\*required foundations course

- 2) Core: Counseling Theory and Practice — 26 quarter hours required
 

Coun. 960	Guidance and Counseling Professional Orientation	1 q.h.
Coun. 962	Counseling: Principles, Theory, Practice	3 q.h.
Coun. 964	Measurement and Assessment Techniques	3 q.h.
Coun. 972	Career Counseling	4 q.h.
Coun. 973	Group Counseling Theory	3 q.h.
Coun. 973A	Group Counseling Practice	3 q.h.
Coun. 975	Counselor Consultation	3 q.h.
Coun. 1011	Clinical Counseling Practice I	3 q.h.
Coun. 1012	Clinical Counseling Practice II	3 q.h.

- 3) Cognate Areas — 6-12 quarter hours required  
 Each student must complete a cognate area consisting of a minimum of six credit hours of study. Cognate areas will be developed by each student with his/her advisor in accordance with student need, interest and the availability of relevant coursework. It should be noted that the YSU Graduate School provides for the possible transfer of up to twelve quarter hours of graduate credit from other accredited institutions. Therefore, not all cognate coursework needs to be limited to YSU. Examples of cognate areas are given below:

**A. Measurement in Counseling**

Psych. 920	Individual Intelligence Testing: Theory and Application I	3 q.h.
Psych. 921	Individual Intelligence Testing: Theory and Application II	3 q.h.
Psych. 923	Individual Intelligence Testing: Practicum	3 q.h.
Coun. 965	Applied Testing in Career Counseling	3 q.h.

**B. Career Counseling**

Psych. 806	Vocational Guidance	4 q.h.
Coun. 822F	Seminar in Career Counseling	3 q.h.
Coun. 963	Occupational and Educational Information in Guidance	3 q.h.
Coun. 965	Applied Testing in Career Counseling	3 q.h.



## C. Exceptional Children

Sp. Ed. 863	Learning Disabilities and Behavior Disorders	4 q.h.
Sp. Ed. 976	Academic Assessment and Remediation in Special Education	3 q.h.
Coun. 879	Counseling with Gifted/Talented Students and Their Families	4 q.h.
Psych. 981	or	
Sp. Ed. 981	Advanced Seminar in Special Education	3 q.h.

## D. Counseling Specialty Areas\*

Coun. 822C	Community Counseling	1-4 q.h.
Coun. 822G	Substance Abuse	1-4 q.h.
Coun. 822K	Survey of Mental Disorders**	1-4 q.h.
Coun. 1013	Topical Seminar in Counseling	1-4 q.h.
Coun. 1014	Topical Seminar in Counseling	1-4 q.h.
Coun. 1015	Topical Seminar in Counseling	1-4 q.h.
Coun. 1017	Group Procedures in Counseling	3 q.h.
Coun. 1028	Advanced Counseling Theory Seminar	3 q.h.

\*A cognate area may be developed in cooperation with the student's advisor from a variety of counseling seminars. This has been made possible by the department's policy to recruit instructors for given seminars who are practicing counselors, psychologists, social workers, etc., in the community mental health setting. Such instructors bring to the instructional program a variety of counseling techniques and knowledge being used locally in community counseling.

\*\*required cognate course

## 4) Internship — 12-18 quarter hours required

Coun. 1010	or	
Psych. 1010	Counseling Internship	6-12 q.h.

Admittance to the field studies component as listed below is dependent upon (1) successful completion of at least 36 quarter hours of graduate coursework that has been appropriately distributed among the behavioral foundations, counseling theory and practice, and cognate areas of study, and (2) successful completion of a comprehensive examination which covers basic counseling theory and practice.

## 5) Electives — 3-9 quarter hours. To be approved by the student's advisor. Required coursework for the M.S. in Education degree with a major in community counseling is minimum of 72 q.h.

**Program Option C: Higher Education Student Services**

## 1) Foundations — 12-15 quarter hours required

Foundations requirements are determined in accordance with the student's interests and program needs. The courses will normally be distributed among the courses listed below or others approved by the department chair.

Ed. 901	Philosophical Foundations of Educational Theory and Practice	3 q.h.
Phil. 815	Existentialism	4 q.h.
Ed. 900	Seminar in History of the Education of Children and Youth	3 q.h.
Ed. 905	A History of American Education	3 q.h.
Ed. 902	Socio-Cultural Aspects of Education	3 q.h.
Ed. 904	Educational Research	3 q.h.
Coun. 968	Applied Research and Development in Counseling	3 q.h.
Psych. 906	Human Growth and Development	3 q.h.
Psych. 907	Psychology of Adjustment	3 q.h.
Soc. 902	Child and Society	4 q.h.
Coun. 976	Social and Cultural Issues in Counseling	3 q.h.

## 2) Core Counseling Courses — 26 quarter hours required

Coun. 960	Guidance and Counseling Professional Orientation	1 q.h.
Coun. 962	Counseling: Principles, Theory, Practice	3 q.h.
Coun. 964	Measurement and Assessment Techniques	3 q.h.
Coun. 972	Career Counseling	4 q.h.
Coun. 973	Group Counseling Theory	3 q.h.

Coun. 973A	Group Counseling Practice	3 q.h.
Coun. 975	Counselor Consultation	3 q.h.
Coun. 1011	Clinical Counseling Practice I	3 q.h.
Coun. 1012	Clinical Counseling Practice II	3 q.h.
3) Cognate Area — 6-12 quarter hours		
Coun. 963	Occupational and Educational Information in Guidance	3 q.h.
Coun. 974	Case Studies in School Guidance	3-6 q.h.
Coun. 1017	Group Procedures in Counseling	3 q.h.
Coun. 1026	Student Personnel Programs in Higher Education	4 q.h.
Coun. 1027	Issues in College Student Personnel Work	4 q.h.
Additional or substitute cognate coursework may be developed by the student and his/her advisor with the approval of the department chair. The cognate area should be developed in accordance with student interest, needs, and the availability of relevant coursework.		
4) Internship — 12 quarter hours required		
Coun. 1005	Internship in Higher Education Student Services	6-12 q.h.
5) Electives — 3-9 quarter hours.		
Required coursework for the M.S. in Education degree with a major in higher education student services is a minimum of 72 q.h.		

**Post-Master's Course of Study in Clinical Counseling**

**Admission Requirements**

The minimum requirement for admission into this course of study is completion of a master's degree in Counseling which meets the education requirements of the State of Ohio Counselor and Social Worker Board for licensure as a professional counselor (L.P.C.)

Preference will be given to applicants who meet or exceed the following: 3.5 GPA (in Master's coursework) and 60 MAT or 1100 GRE. In addition, preference will be given to applicants who:

- 1) are practitioners in the field
- 2) are National Certified Counselors or who meet eligibility requirements for the NCC
- 3) are active in counseling professional organizations
- 4) are licensed in Ohio at the Licensed Professional Counselor (LPC) level.

**Curriculum**

In addition to meeting the educational requirements for Licensed Professional Counselor set forth in section 4757.07 of the Ohio Revised Code and in Rule 4757-02 of the Administrative Code, a student in the YSU Clinical Counseling Course of Study must earn a minimum of thirty quarter hours of instruction comprised of at least one graduate course in each of the following areas: 1) clinical psychopathology, personality, and abnormal behavior; 2) evaluation of mental and emotional status; 3) diagnosis of mental and emotional disorders; 4) methods of intervention and prevention of mental and emotional disorders; and 5) treatment of mental and emotional disorders. The following represents coursework for the post-master's Clinical Counseling endorsement curriculum.

1) Clinical Counseling Core — 15 q.h. required		
Coun. 1031	Clinical Counseling Theory (1,3)	3 q.h.
Coun. 1032	Clinical Evaluation I (2,3)	3 q.h.
Coun. 1036	Consultation and Educational Approaches to Prevention (4) (prereq.: Coun. 975)	3 q.h.
Coun. 1037	Counseling Methods of Intervention and Prevention (4)	3 q.h.
Coun. 1041	Clinical Counseling Practice III (5)	3 q.h.
2) Cognate Areas — 9-12 q.h. (such areas as developed by student with advisor)		
A) Psychology		
Psych. 920	Intelligence Testing, Theory and Application I (2)	3 q.h.
Psych. 921	Intelligence Testing, Theory and Application II (2)	3 q.h.

Psych. 940	Personality Theory (1)	3 q.h.
Psych. 950	Survey of Personality Assessment (2,3) (prereq. 840)	3 q.h.
Psych. 955	Psychopathology (1,3)	3 q.h.
Psych. 1000	Psychopharmacology (5)	3 q.h.
Coun. 1034	Practicum in Clinical Evaluation (2,3)	3 q.h.
B) Marriage and Family Counseling		
Coun. 821F	Introduction to Marriage and Family Counseling (4)	3 q.h.
Coun. 1038	Marriage and Family Counseling (5) (prereq.: 821F)	3 q.h.
C) Mental Health Administration and Services		
Coun. 1039	Admin. and Super. of Mental Health Services (4)	4 q.h.
3) Internship — 6-12 q.h. (may be repeated)		
Coun. 1050	Clinical Counseling Internship (5)	6-12 q.h.

### Special Education Program

The master's degree program in special education provides advanced cognitive and educational skills for those who are presently working, or expect to work, as clinical/developmental personnel serving handicapped individuals, or as supervisors of special education. A candidate for the program must present a certificate in an area of special education or have completed all certification requirements except for student teaching.

A total of 48 q.h. of coursework, as indicated below, is required for the Master of Science in Education degree in special education.

Candidates will be expected to pass a comprehensive examination on the Special Education core curriculum. The department chair should be consulted for details.

1) Foundations of Education: A minimum of 6 q.h., including:

Ed. 904	Educational Research	3 q.h.
One additional graduate course in foundations of education, as approved by student's advisor, 3 q.h.		

2) Core courses in special education: 24 q.h. required. Designed to provide students with advanced diagnostic/prescriptive skills applicable to a wide range of children's learning problems.

Ed. 976	Academic Assessment and Remediation in Special Education	3 q.h.
Ed. 978	Supervision and Administration in Special Education	3 q.h.
Ed. 979	Assessment and Remediation of Language and Cognitive Process Dysfunctions in Special Education	3 q.h.
Ed. 981	Seminar in Special Education	3 q.h.
Ed. 983	Major Concepts in Special Education	3 q.h.
Ed. 984	Educational Programs for Handicapped Children	3 q.h.
Ed. 985	Resource Rooms & Supplemental Services for Special Educ.	3 q.h.
Ed. 986	Severe Behavior Handicaps.: Assess. and Classroom Mgmt.	3 q.h.

3) Cognate Areas: A minimum of 6 q.h. must be selected within a cognate area by the student and advisor. These areas include:

Foundations of Education	Counseling Techniques
Elementary Curriculum	Human Relations
Secondary Curriculum	Remedial Reading
Physical Education	Early Childhood Education
Supervision and Administration	Vocation Guidance
Assessment/Prescriptive Skills	Gifted Education

4) Electives: A maximum of 12 q.h. approved by the student's advisor; may constitute an extension of the first, or the selection of a second, cognate area.

**Master Teacher Program: Gifted and Talented Education Specialist**

- 1) Required courses for specialization (26 quarter hours)
  - Ed. 874 Gifted and Talented Programs 4 q.h.
  - Ed. 878 Teaching Gifted and Talented Students 4 q.h.
  - Coun. 879 Counseling Gifted/Talented Students and Their Families 4 q.h.
  - Ed. 936 Characteristics and Needs of the Academically Gifted Child 4 q.h.
  - Ed. 946 The Supervision of Instruction 3 q.h.
  - Sp. Ed. 989 Educational Assessment of Gifted & Talented 4 q.h.
  - Ed. 1040 Field Experience in Gifted & Talented Education 3 q.h.
- 2) Cognate Area (7 quarter hours)
  - Psych. 838 Psychology of the Exceptional Child: Gifted 3 q.h.
  - Engl. 918 Children's Literature 4 q.h.
- 3) Foundations of Education (12 quarter hours). See description of requirement under Option A.
- 4) Electives (3 quarter hours)

All master teacher gifted/talented students will be required to take a comprehensive examination over required courses for specialization.

## MASTER OF SCIENCE IN ENGINEERING

Programs in civil, electrical, and mechanical engineering, and materials science lead to the degree Master of Science in Engineering. An early placement program for the Ph.D. in Engineering with Akron University is available. Check with appropriate department for details. *Students interested in this program should follow the Traditional Option.*

### Admission Requirements

In addition to the requirements for admission to the Graduate School, applicants must show an unrecalculated grade-point average in undergraduate study of at least 2.75 (on a 4.0 scale) in the courses in the field of specialized study, and meet essentially all of the undergraduate prerequisites for the proposed field of graduate study. Applicants with lesser qualifications may be admitted on the basis of evaluation of their undergraduate record by the engineering department in which they wish to enroll. Applicants may be required to take certain courses, to be determined by their advisors, to make up deficiencies. The students will not be given credit toward the graduate degree for such courses.

### Degree Requirements

The above-listed departments offer two graduate program options: traditional and administrative.

### Traditional Option

At least 45 quarter hours are required, divided in the following manner:

- 1) Mathematics: 8 quarter hours, usually Mathematics 910, 911; Advanced Engineering Mathematics I and II (4, 4 q.h.)
- 2) Interdepartmental Courses: 12 quarter hours from:
  - C.E. 941 Structural Mechanics 4 q.h.
  - C.E. 947 Finite Element Analysis 4 q.h.
  - C.E. 966 Air Pollution Control 4 q.h.

E.E. 901	Control Systems I	4 q.h.
E.E. 931	Digital Systems Engineering I	4 q.h.
E.E. 951	Network Analysis	4 q.h.
I.E. 825	Advanced Engineering Economy	4 q.h.
I.E. 901	Optimization Techniques	4 q.h.
I.E. 902	Digital Simulation	4 q.h.
Mat. Sci. 901	Fundamentals of Materials Science	4 q.h.
Mat. Sci. 903	Structural Properties/Characteristics of Materials	4 q.h.
Mat. Sci. 904	Mechanical Properties/Characteristics of Materials	4 q.h.
M.E. 963	Experimental Stress Analysis	4 q.h.
M.E. 982	Advanced Engineering Analysis	4 q.h.
M.E. 986	Theory of Continuous Medium	4 q.h.

Each student is required to complete at least one out-of-department engineering course. Other out-of-department engineering courses may be substituted with the approval of the student's advisor or committee.

### 3) Departmental Courses: 25 q.h.

## Administrative Option

At least 48 quarter hours are required, divided into the following manner:

### 1) Out-of-Department Courses, at least 20 q.h. from:

Acct. 900	Financial Accounting for Management	5 q.h.
Acct. 902*	Management Accounting Systems	3 q.h.
Econ. 901	Basic Economic Analysis	5 q.h.
Econ. 926	Aggregative Economics for Business Decision Making	4 q.h.
I.E. 801	Linear Programming	4 q.h.
I.E. 825	Advanced Engineering Economy	4 q.h.
I.E. 850	Introduction to Operations Research	4 q.h.
I.E. 901	Optimization Techniques	4 q.h.
I.E. 902	Digital Simulation	4 q.h.
I.E. 903	Engineering Statistics	4 q.h.
Finance 900	Foundations of Finance	3 q.h.
Finance 921	Financial Management	4 q.h.
Mgmt. 900	The Foundation of Management	3 q.h.
Mgmt. 915*	Research Methodology	4 q.h.
Mgmt. 916*	Quantitative Analysis for Business Decisions	4 q.h.
Mgmt. 917*	Management Information Systems	4 q.h.
Mgmt. 951*	Theory of Organization	4 q.h.
Mgmt. 952*	Management Theory and Thought	3 q.h.
Mgmt. 961*	Organizational Behavior	4 q.h.
Mgmt. 966*	Operations Management II	4 q.h.
Mktg. 900	Foundations of Marketing	3 q.h.
Mktg. 942*	Marketing Administration	4 q.h.
Math. 841**	Mathematical Statistics II	4 q.h.
Math. 910	Advanced Engineering Mathematics I	4 q.h.
Math. 911	Advanced Engineering Mathematics II	4 q.h.
Pub. Rel. 950	Theory and Practice of Public Relations	3 q.h.

\*The 900 course in the appropriate department — Accounting, Management, or Marketing or an equivalent course, is prerequisite.

\*\*Math. 743 is prerequisite.

### 2) Departmental Courses: at least 28 q.h. (This is a non-thesis option.)

One out-of-department engineering graduate course may be substituted with the approval of the student's advisor or committee.



## CIVIL ENGINEERING

Jack D. Bakos, Jr.  
*Chair of the Department*  
267 Engineering Science Building  
(216) 742-3027

This program, which includes the traditional and administrative options, offers opportunities for advanced studies in two general areas: structural mechanics and environmental/water resources engineering.

A minimum of 16 quarter hours of departmental courses plus a thesis (9 q.h.) is required of all students participating in the 45 quarter hour traditional option. Upon completing the thesis, the student must orally present and successfully defend the thesis. The thesis requirements may be waived by the department chair, in which event the student will be required to take a total of 52 quarter hours of course work with a minimum of 32 quarter hours of civil engineering courses. When 40 quarter hours of course work have been completed, the non-thesis student must pass an oral and/or written examination. A student in the 48 quarter hour administrative option must pass an oral and/or written exam upon completion of the 28 quarter hour departmental requirement. The administrative option is geared for those candidates who have entered, or who are about to enter, the engineering administration field and, as such, is usually open only to those who have accumulated at least four years of professional experience or obtained P.E. status.

At the time of initial enrollment, the student will be required to select his/her option (thesis, non-thesis or administrative) and specialization (structural, environmental, or water resources), and in cooperation with an assigned department faculty member, will establish a course work plan, including alternate course selections.

For purposes of fulfilling the 12 quarter hour interdepartment course requirement in the traditional thesis option, the environmental/water resources emphasis may include CE 978 — Water Resources Planning.

Thesis students who have registered for all required thesis hours and have completed all course requirements, but have not finished the thesis are required to maintain current student status if they expect to receive or utilize any University service, e.g., parking, computer, library, advisor assistance, thesis defense, committee action, etc. This can normally be accomplished by registering for at least one (1) hour of CE 992.

## ELECTRICAL ENGINEERING

Salvatore R. Pansino  
*Chair of the Department*  
276 Engineering Science Building  
(216) 742-3012

The Department of Electrical Engineering provides opportunities for specialized study in control systems, electronics, electro-magnetic fields, sensors, and digital systems and microcomputer applications. Thesis and research are dependent upon student-faculty interaction. At the time of enrollment the student is required to select one of two options (traditional or administrative.).

After the completion of 12 credit hours, the student is assigned a program committee which will jointly develop the remaining program of study.

Ordinarily, a student's program of study will include a nine credit hour thesis requirement. Upon completing the thesis, the student must present and successfully defend the thesis findings. The thesis requirement may be waived and replaced with nine credit hours of coursework, upon the recommendation of the student's program committee. The non-thesis student must also successfully pass a comprehensive exam covering all electrical engineering courses that were taken for graduate credit.

## MATERIALS SCIENCE

Richard W. Jones  
*Director of the Program*  
216 Engineering Science Building  
(216) 742-1735

For admission to the Materials Science program the candidate must have a bachelor's degree in engineering or in a natural science (physics, chemistry, or mathematics). Any candidate not holding an undergraduate degree in materials/metallurgy/ceramics may be required to take Materials Engineering 606, and will be required to take Materials Science 901 and 901L. None of these courses will be given credit toward the graduate degree.

A thesis, a non-thesis, and an administrative option are available in the program. Requirements for the administrative option are described elsewhere in this catalog.

For the thesis and non-thesis options the student must complete a minimum of 48 quarter hours, 12 quarter hours of which must be in mathematics and other engineering disciplines. Both of these options require Materials Science 903, 904, 915, 924, 925, and 980. In addition to these requirements the non-thesis option also requires Materials Science 976.

Details of the graduation requirements (including substitution for required courses), course scheduling, thesis requirements, and other program regulations are available in the Materials Science Student Handbook.

## MECHANICAL ENGINEERING

Frank A. D'Isa  
*Chair of the Department*  
201 Engineering Science Building  
(216) 742-3016

Two general areas of specialization in course work and research are offered: mechanics of rigid and deformable solids, and heat and fluid flow.

Students pursuing the traditional option will be assigned to a graduate committee after completing a minimum of 12 credit hours, including Mathematics 910 and Mechanical Engineering 982. The committee, in consultation with the student, will plan the remaining course work and determine if the program is to include a thesis. A maximum of nine hours of credit toward the degree may be obtained for *Thesis and Graduate Projects*. If a thesis is undertaken, the student will be required to defend it in an oral examination. If a thesis is not undertaken, the student will be required to take at least three credit hours of course work beyond the minimum of 45 required for the degree. At the discretion of the graduate committee, a student may be required to take a qualifying examination as a degree requirement.

In the traditional option, Mathematics 910, Mathematics 911 and Mechanical Engineering 982 are required of all mechanical engineering students, along with the completion of 16 credit hours of 900-level mechanical engineering courses (excluding *Thesis and Graduate Projects*.)

The requirements of the administrative option are outlined on page 60. Mechanical engineering students selecting this option are required to complete 16 credit hours of 900-level mechanical engineering courses including Mechanical Engineering 982, but excluding Graduate Projects.

## Courses

## ACCOUNTING AND FINANCE

James A. Tackett, *Chair of the Department*  
 620 Williamson Hall  
 (216) 742-3084

## Accounting

900. *Financial Accounting for Management.* A survey of the fundamental concepts of financial accounting with special emphasis upon the interpretation and use of financial accounting data for administrative purposes. (Not applicable toward the MBA) 5 q.h.

902. *Management Accounting Systems.* A study of the managerial aspects of accounting and their relationship to financial accounting principles. The process of classifying and analyzing raw data for validity and relevance and communicating this information in a format that can be interpreted by management with whom the responsibility of decision-making lies is discussed in detail. The various elements of cost planning and control including the measurement of the efficient use of materials, labor, and overhead through the development of standards for both fixed and variable costs and the comparison against actual costs in each category. The determination of variances and the establishment of flexible budgets by cost centers are reviewed. Distribution costs will be discussed. Not available for credit to MBA students in the accounting concentration. Prereq.: Acct. 900. 3 q.h.

903. *Fundamental Concepts of Taxation.* A study of the basic concepts of income taxation in the United States affecting individuals and businesses including an examination of the consequences of property transactions, basis, gains and losses, nonrecognition of income provisions, depreciation recapture and investment credit. Prereq.: Acct. 900 or equivalent. Not available for credit to MBA students in the accounting concentration. 4 q.h.

905. *Business Tax Planning I.* A study of income tax laws concerning corporations generally and including the creation of corporations, distributions from corporations, stock redemptions, personal holding companies, collapsible corporations, thin corporations, and unreasonable accumulation of earnings. Prereq.: Acct. 814 or 903. 4 q.h.

906. *Estate Planning.* A study of the tax implications involving estates. Emphasis on the importance of estate planning; the devices available for use in such planning, effective uses of lifetime gifts, trusts, life insurance, pension plans, profit sharing, and other fringe benefit plans. The effects of state inheritance tax and property laws upon estate planning will be emphasized. Prereq.: C or better in Acct. 707 or 813. 3 q.h.

908. *Auditing Theory and Practice.* A study of auditing standards and procedures, use of statistical and other quantitative techniques and auditing electronic data processing installations. Other topics include practice before the Securities and Exchange Commission, special reporting problems, current developments in auditing, professional ethics and responsibilities, and extensions of the attest function. Prereq.: Acct. 808. 4 q.h.

909. *Management Information and Control Systems.* A study of the formalized set of interrelated methods, procedures and equipment utilized in developing, processing, storing and reporting business financial and statistical information. The major emphasis is on computerized systems, although some attention is also given to manual operations and/or subsystems. Prereq.: Acct. 610. 3 q.h.

912. *Advanced Management and Cost Accounting.* An examination of the managerial uses of accounting information for planning and control and an investigation of cost accounting theory and practice. Prereq.: Acct. 711. 4 q.h.

915. *Research Techniques*. Nature, methods and techniques of research and the use of research by management; the scientific method in business, sampling theory, variable analysis and research cases. 3 q.h.

930. *Accounting Theory*. A survey of the history and development of accounting conventions, concepts and principles leading to an intensive study of contemporary thought relative to income determination and asset valuation. Prereq.: Acct. 703, 704, 705, or equivalent. 4 q.h.

940. *International Accounting*. A study of the international dimensions of accounting, including such topics as the pattern of accounting development found in other nations, differences in accounting between the United States and other countries, the promulgation of worldwide accounting standards and the accounting problems associated with multinational corporation operations, including translation of foreign currency financial statements. Prereq.: Acct. 930, or 902. 3 q.h.

960. *Seminar in Accounting*. Specific topics selected by the staff from timely and controversial work published in the field. Prereq.: All core courses, plus at least 9 hours (900-level) in the accounting concentration, or permission of instructor. 3 q.h.

975. *Business Tax Planning II*. This course continues the study of income tax laws concerning corporations generally, including Subchapter S corporations, corporate reorganizations, partnership taxation, and tax administration and practice. Prereq.: Acct. 905. 3 q.h.

980. *Governmental and Non-Profit Accounting*. A study of accounting systems for federal, state and local governmental agencies and other not-for-profit organizations. (Not available for credit to students who have had Acct. 820.) Prereq.: Acct. 900 or equivalent. 3 q.h.

996. *Research Problems*. Special projects undertaken by M.B.A. students under the direction of faculty members of professorial rank. The exact number to be used will be determined by the nature of the project. Credit will be determined in each case in the light of the nature and extent of the project. 1-6 q.h.

998. *Thesis*. 6 q.h.

## Finance

900. *Foundations of Finance*. A survey of the fundamental concepts of the business finance discipline. Emphasis is given to the role of finance in the firm; the capital budgeting decision tools, including present value analysis; and the mechanics of efficient short-term funds use. (Not applicable toward MBA.) Prereq.: Acct. 900, Econ. 624 and 901. 3 q.h.

921. *Financial Management*. A study of business finance through the use of case study analysis, including relevant articles and text material. Major topics deal with working capital management, net present value — IRR, lease vs. buy, and the cost of capital. Case analysis is used to integrate financial theory into an applied managerial decision-making context. Prereq.: Acct. 900, Econ. 900, Econ. 901, and Fin. 900. 4 q.h.

922. *Capital Management*. Managerial economics of capital budgeting, sourcing, rationing and control for large enterprises; forecasting demand and internal generation of capital; intangible capital investments; administration of capital appropriations; public policy implications. Prereq.: Fin. 921, Mgmt. 916, or permission of instructor. 3 q.h.

923. *Portfolio Analysis*. The major emphasis will be on selection in both theory and practice by applying the appropriate analytical principles and techniques to fixed income, securities, common stocks, and senior securities with speculative features. A research paper involving the application of analytical techniques is a requirement. Prereq.: Fin. 921. 4 q.h.

924. *Securities Analysis*. The major emphasis will be an in-depth financial study of several firms within an industry. This study will be accomplished by applying the appropriate analytical principles and techniques to the firms' financial statements. A research paper will be required. Prereq.: Fin. 921. 3 q.h.



940. *Corporate Financial Strategy*. A descriptive analysis of the following areas of finance: Capital Market theory and Intermediary Institutions, including primarily the investment funds source media, securities markets, large business finance needs, and various market sources of funds. Investigates corporate strategies in the acquisition of funds from institutional sources, types of investment instruments used, the institutional limitations imposed on businessmen raising funds, and institutional changes necessary to ensure adequate availability of external capital. Journal articles dealing with credit rating agency effectiveness, venture capital sources, and the capital underwriting institutions are discussed. Prereq.: Fin. 921, Econ. 901, or equivalent. 3 q.h.

970. *Seminar in Finance*. Specific topics selected by the staff from timely and controversial work published in the field. Prereq.: All core courses, plus at least 9 hours (900-level) in the finance concentration, or permission of instructor. 3 q.h.

996. *Research Problems*. Research under the supervision of a graduate faculty member with the approval of the department chair. Credit will be determined in each case in the light of the nature and extent of the project. 1-6 q.h.

998. *Thesis*. 6 q.h.

## ART

Michael J. Walusis, *Chair of the Department*  
4001 Bliss Hall  
(216) 742-3627

The student planning to major in art is required to submit a portfolio of work to the graduate committee of the Art Department when applying for admission to the Graduate School.

806. Indian Art (3 q.h.)

810. Ceramics III (3 q.h.)

811. Ceramics IV (3 q.h.)

814. 20th-Century Art to 1925 (3 q.h.)

815. 20th-Century Art from 1925 (3 q.h.)

816. Introduction to Museum Practices (5 q.h.)

822. Puppetry and Stage Construction (3 q.h.)

870. Advanced Printmaking (1-8 q.h.)

880. Photography 6 (5-10 q.h.)

890. Problems in Art History (1-9 q.h.)

920. *Seminar in Art Education*. Problems and projects that pertain to the teaching of art at various levels of learning within our schools. The graduate program includes both studio work and pedagogical studies. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Graduate standing and permission of instructor. 2-5 q.h.

925. *Research in Art Education*. An individual and inventive approach to solving existing problems in art education based upon the philosophy, psychology, principles, practices, and perceptions of past and contemporary trends in art education. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Art 920 and permission of instructor. 5 q.h.

950. *Studio Problems in Painting*. Individual research of two-dimensional form through various media including oil, acrylic, water color, collage, etc. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Graduate standing. 5 q.h.

951. *Studio Problems in Painting*. Continuation of 950. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Art 950. 5 q.h.

952. *Studio Problems in Painting*. Continuation of 951. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Art 951. 2-5 q.h.



## 66 COURSES

960. *Studio Problems in Sculpture*. Individual research of plastic form through various media including plastics, wood, stone, metals, and related materials. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Graduate standing. 5 q.h.

961. *Studio Problems in Sculpture*. Continuation of 960. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Art 960. 5 q.h.

962. *Studio Problems in Sculpture*. Continuation of 961. May be repeated for a maximum of 10 quarter hours credit. Prereq.: Art 961. 2-5 q.h.

## BIOLOGICAL SCIENCES

Paul D. Van Zandt, *Chair of the Department*  
4037 Ward Beecher Hall  
(216) 742-3601

- 803. Population and Community Ecology (5 q.h.)
- 804. Aquatic Ecology (4 q.h.)
- 804L. Aquatic Ecology Laboratory (2 q.h.)
- 805. Ichthyology (4 q.h.)
- 806. Field Ecology (5 q.h.)
- 809. Concepts of Developmental Biology (4 q.h.)
- 812. Mycology (4 q.h.)
- 819. Taxonomy of Flowering Plants (5 q.h.)
- 821. Plant Anatomy (5 q.h.)
- 822. Plant Physiology (5 q.h.)
- 823. Molecular and Population Genetics (4 q.h.)
- 824. Bacterial and Viral Physiology (4 q.h.)
- 825. Radioisotopes in Biology (4 q.h.)
- 827. Gene Manipulation (4 q.h.)
- 830. Immunology (5 q.h.)
- 832. Principles of Neurobiology (4 q.h.)
- 833. Mammalian Endocrinology (4 q.h.)
- 834, 835. Vertebrate Physiology I and II (5+5 q.h.)
- 836. Molecular Biology of the Cell (2 q.h.)
- 836L. Molecular Biology of the Cell Laboratory (2 q.h.)
- 837. Cytology and Techniques (4 q.h.)
- 838. Biology of Enzymes (4 q.h.)
- 840. Pathogenic Bacteriology (4 q.h.)
- 841. Animal Parasitology (4 q.h.)
- 842. Advanced Parasitology (4 q.h.)
- 853. Biometry (4 q.h.)
- 860. Evolution (4 q.h.)
- 872. Protozoology (4 q.h.)
- 873. Mammalogy (4 q.h.)

950. *Comparative Animal Physiology I*. Evolutionary development of respiratory, circulatory, nervous, and muscle systems in animal kingdom. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 835. 5 q.h.

951. *Developmental and Comparative Neurobiology*. Developmental and evolutionary principles as applied to neurobiology. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty. Prereq.: Biol. 792 or equivalent. 4 q.h.

952. *Experimental Design*. Controlling variables, experimental design, and treatment of data from biological experiments. Prereq.: Biol. 853. 4 q.h.

953. *Quantitative Ecology*. Quantitative aspects of populations and communities with emphasis on the development of mathematical models used to simulate complex ecological interactions. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 803 or 952 and 853 or 954 and one year of college calculus. 4 q.h.
954. *Advanced Ecology*. Interrelationships of species within the community and their influence upon the ecosystem. Prereq.: Biol. 803. 4 q.h.
956. *Physiological Ecology*. The study of physiological and behavioral adaptations of vertebrates faced with selected environmental stresses of their habitats. Includes metabolism, thermo and osmoregulation. Prereq.: Biol. 834 and 803. 4 q.h.
959. *Analytical Cytochemistry*. An analysis of cell and tissue structure by use of histochemical and cytochemical techniques, including microspectrophotometry, high resolution electrophoresis, autoradiography, and high pressure liquid and gas chromatography. Two hours lecture and four hours laboratory per week. Prereq.: Graduate standing or permission of instructor. 4 q.h.
960. *Plant Growth and Development*. Motivating forces of plant development. Prereq.: Biol. 790. 4 q.h.
962. *Medical Mycology*. Morphology, physiology, and epidemiology of medically important fungi. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 702. 4 q.h.
963. *Virology*. Study of plant and animal viruses. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 702. 4 q.h.
964. *Microbial Genetics*. An examination of bacterial properties and functions in terms of their underlying genetic and biochemical mechanisms. Prereq.: Biol. 790 or permission of instructor. 4 q.h.
965. *Principles of Electron Microscopy*. Students must demonstrate a proficiency in the careful and efficient use of the scanning electron microscope and the application of supplemental equipment for specimen preparation such as the vacuum evaporator, critical point drying apparatus, and sputter-coater. Prereq.: Biol. 837 or equivalent. 3 q.h.
967. *Human Gross Anatomy*. An intensive study of human macromorphology. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty. Prereq.: Biol. 775 or 710, or equivalent. 5 q.h.
968. *Microscopic Anatomy*. Morphological basis for normal and disturbed functions. Structure and function relationships in human microscopic anatomy. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty. Prereq.: Biol. 713 and 713L or equivalent. 5 q.h.
969. *Functional Neuroanatomy*. Study of structure and function of the mammalian nervous system with emphasis on the human. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty. Prereq.: Biol. 792 or equivalent. 5 q.h.
972. *Systematic Zoology*. Principles, significance, and procedure of zoological taxonomy. Prereq.: Biol. 701. 3 q.h.
988. *Seminar in Biological Sciences*. May be repeated up to 2 q.h. 1 q.h.
989. *Arranged Independent Study*. Study that is supervised by a faculty member. May be repeated up to 6 q.h. Prereq.: Permission of instructor. 2 q.h.
990. *Master's Thesis Research*. Research selected and supervised by departmental advisor and approved by graduate faculty of Biology Department and Dean of Graduate School. Prereq.: Acceptance by departmental committee. 1-15 q.h.
991. *Botany Topics*. Arranged course in botany. Prereq.: Permission of instructor. 2-4 q.h.
992. *Invertebrate Zoology Topics*. Arranged courses on subjects of invertebrate zoology. Prereq.: Permission of instructor. 2-4 q.h.

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993. *Vertebrate Zoology Topics*. Arranged courses on aspects of vertebrate zoology. Prereq.: Permission of instructor. 2-4 q.h.
994. *Genetics and Evolution Topics*. Arranged courses in principles of genetics and forces of evolution. Prereq.: Permission of instructor. 2-4 q.h.
995. *Parasitology Topics*. Arranged courses in field of parasitology. Prereq.: Permission of instructor. 2-4 q.h.
996. *Environmental Biological Topics*. Arranged courses in terrestrial and aquatic ecology. Prereq.: Permission of instructor. 2-4 q.h.
997. *Molecular Biology Topics*. Arranged courses in subjects at molecular level of life. Prereq.: Permission of instructor. 2-4 q.h.
998. *Vertebrate Physiology Topics*. Arranged courses for advanced topics in vertebrate physiology. Prereq.: Biol. 835 and permission of instructor. 2-4 q.h.
999. *Cell Biology Topics*. Arranged courses for advanced topics in cell biology. Prereq.: Biol. 836 and permission of instructor. 2-4 q.h.
1000. *Microbiology Topics*. Arranged courses on subjects of microbiology. Prereq.: Background appropriate to specific topic. 2-4 q.h.
1001. *Mammalian Endocrinology Topics*. Arranged courses on subjects of mammalian endocrinology. Prereq.: Background appropriate to specific topic. 2-4 q.h.
1002. *Special Topics*. Advanced topics in medical education covering areas not otherwise available. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty. Prereq.: Background appropriate to specific topic. 3 q.h.
1003. *Neurobiology Topics*. Arranged course on subjects of neurobiology. Prereq.: Background appropriate to specific topic. 2-4 q.h.
1010. *Techniques in Animal Tissue Culture*. Procedures for in vitro culture of cells from tissues and organs including preparation of culture media and maintenance of primary and secondary cultures. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 702 or equivalent. 4 q.h.

## BUSINESS EDUCATION AND TECHNOLOGY

Violet F. Boggess, *Chair of the Department*  
3077 Cushwa Hall  
(216) 742-3336

820. *Techniques of Office Simulation Procedures* (4 q.h.)
826. *Teaching Intensive and Cooperative Office Education* (4 q.h.)
831. *Alternate Shorthand Systems* (3 q.h.)
860. *Principles and Problems of Business Education* (3 q.h.)
904. *The Improvement of Teaching Business Communication*. Communication theory; techniques and materials for teaching business letter writing, business report writing, oral communication in business, and business English. Prereq.: BET 704 or equivalent. 3 q.h.
910. *The Improvement of Teaching Shorthand*. Techniques and materials for the teacher of shorthand and transcription. Research is emphasized. Prereq.: BET 623 and BET 631 or equivalent. 3 q.h.
920. *The Improvement of Teaching Typewriting*. Techniques and materials for the teacher of typewriting. Research is emphasized. Prereq.: BET 623 or equivalent. 3 q.h.

930. *The Improvement of Teaching Basic Business.* Techniques and materials for the teacher of the basic business subjects, including general business, business law, and consumer economics. Research is emphasized. Prereq.: BET 706, Econ. 621, and Mgmt. 511 or equivalent. 3 q.h.

940. *The Improvement of Teaching Bookkeeping and Accounting.* Techniques and materials for the teacher of bookkeeping and accounting. Research is emphasized. Prereq.: Acct. 606 or equivalent. 3 q.h.

950. *The Improvement of Teaching Office Practice and Office Machines.* Techniques and materials for the teacher of office practice and office machines. Research is emphasized. Prereq.: BET 615; and BET 805 or equivalent. 3 q.h.

980. *Seminar in Business Education.* Study of selected topics chosen by the business education staff. May be repeated by non-degree student. Prereq.: Permission of instructor. 1-4 q.h.

## CHEMICAL ENGINEERING

Dilip K. Singh, *Chair of the Department*

2030 Engineering Science Building

(216) 742-3020

805. Principles of Biomedical Engineering (4 q.h.)

817. Management of Nuclear By-Products (1 q.h.)

830. Introduction to Nuclear Reactors (3 q.h.)

831. Introduction to Nuclear Materials (3 q.h.)

835. Introduction to Nuclear Fusion (3 q.h.)

886. Nuclear Reactor Design (4 q.h.)

## CHEMISTRY

Thomas N. Dobbstein, *Chair of the Department*

5053 Ward Beecher Hall

(216) 742-3663

801. Elements of Physical Chemistry (4 q.h.)

Note: The above course may not be counted towards an M.S. in chemistry, but may be taken for graduate credit by students in other programs.

803, 804. Chemical Instrumentation I, II (4+3 q.h.)

805. Applied Spectroscopy (3 q.h.)

807. Chemical-Instrumentation Interfacing (4 q.h.)

813. Thermodynamics and Kinetics (3 q.h.)

821. Intermediate Organic Chemistry (3 q.h.)

822. Organic Analysis (3 q.h.)

823. Organic Synthesis (3 q.h.)

824. Polymer Chemistry (3 q.h.)

825. Polymer Chemistry Laboratory (3 q.h.)

829, 830. Inorganic Chemistry II, III (2+2 q.h.)

831. Inorganic Chemistry Laboratory (2 q.h.)

835. Nuclear Chemistry and Its Applications (3 q.h.)

836. Chemical Bonding and Structure (3 q.h.)

864. Chemical Toxicology (3 q.h.)

911. *Advanced Analytical Chemistry.* The theoretical foundation of analysis with emphasis on recent analytical developments and the current literature. Prereq.: Chem. 741 or 801. 3 q.h.

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913. *Clinical Chemical Instrumentation*. The principles and uses of instrumental techniques as applied to clinical laboratory separation, characterization and analysis. Two hours lecture and three hours laboratory. Prereq.: Chem. 604. 3 q.h.
915. *Automation in Clinical Chemistry*. The interfacing of laboratory instrumentation with data processing equipment. Two hours lecture and three hours laboratory. Prereq.: Chem. 803 or 913. 3 q.h.
- 922, 923, 924. *Principles of Biochemistry I, II, III*. A comprehensive study of modern biochemistry. The molecular constituents of living organisms and their dynamic interrelationships will be discussed. Prereq.: Chem. 721 or 793; prereq. or concurrent, Chem. 739 or 801 for 922; 740 or 801 for 923. 3+3+3 q.h.
- 925, 926. *Biochemical Techniques*. A laboratory course designed to familiarize the student with biochemical methodology and illustrate experimentally some important biochemical principles. Experiments include the isolation, purification, and characterization of enzymes, nucleic acids, and other biological materials as well as a study of metabolic processes. Need not be taken in sequence. Six hours of laboratory including discussions. Prereq. or concurrent: Chem. 923. 2+2 q.h.
931. *Advanced Inorganic Chemistry*. Current theories and types of bonding. Modern structural principles with applications in inorganic and coordination chemistry. Prereq.: Chem. 829 or 830, or equivalent. 3 q.h.
- 935, 936. *Nuclear Chemistry I, II*. The principles and experimental procedures used in the study of nuclear transformations, natural and artificial disintegration. Prereq.: Chem. 835 or 741, 935 prereq. to 936. 3+2 q.h.
941. *Advanced Organic Chemistry*. Reaction mechanisms and physical organic chemistry. Prereq.: Chem. 721 and either 741 or 801. 3 q.h.
943. *Medicinal Organic Compounds*. An introduction to the chemistry and biological activity of organic medicinal compounds. Prereq.: Chem. 721. 3 q.h.
944. *Natural Products*. The chemistry of natural products, such as alkaloids, terpenes, antibiotics and steroids, will be covered. 3 q.h.
945. *Advanced Polymer Chemistry*. A study of the polymerization process and the relationship between structure and polymer properties. Prereq.: Chem. 824. 3 q.h.
946. *Biomedical Polymers*. A survey of biomedical polymers, biopolymers, pseudo-enzymes, and other related topics. Prereq.: Chem. 824 or 922. 3 q.h.
951. *Advanced Physical Chemistry I*. Application of quantum chemistry to spectroscopy, kinetics and thermodynamics. Prereq.: Chem. 741. 3 q.h.
952. *Advanced Physical Chemistry II*. Further development of quantum theory as applied to chemical systems. Prereq.: Chem. 951. 3 q.h.
955. *Statistical Mechanics*. Principles and methods of statistical mechanics; classical and quantum statistics with applications to gases, liquids, and solids. Prereq.: Chem. 951 or permission of instructor. 3 q.h.
961. *Clinical Chemistry I*. Principles and methods of clinical chemistry including general laboratory procedures, quality control, and normal values. The chemistry of carbohydrates, proteins, lipids, and electrolytes including renal, liver, and pancreatic function tests, is discussed. Prereq.: Chem. 923. 3 q.h.
962. *Clinical Chemistry II*. Principles and methods of clinical enzymology, endocrinology, and toxicology including thyroid and cortical function tests will be covered. Prereq.: Chem. 961. 3 q.h.



963. *Clinical Chemistry Practicum*. Operation and management of the hospital clinical laboratory. The student will spend ten weeks fulltime in an affiliated hospital laboratory. Prereq.: Chem. 913 and 961 and consent of Chair of the Chemistry Department. Applications for this course must be received by the Chair of the Chemistry Department during the first week of the quarter prior to the quarter in which the student wishes to register for the practicum. 3 q.h.

969. *Laboratory Problems*. A laboratory course which stresses individual effort in solving chemical problems. Not applicable to the M.S. degree in chemistry. Recommended for high school chemistry teachers. May be repeated up to 9 q.h. Prereq.: An undergraduate minor in chemistry. 3 q.h.

971, 972, 973. *Medical Pharmacology*. The chemical, medical and pharmacological characteristics of drugs and related materials. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty, and must be taken in sequence. Prereq.: Organic chemistry and permission of instructor. 3+3+3 q.h.

974. *Medical Toxicology*. The toxicological effects of chemical agents from a medical standpoint. This course is offered at the Northeastern Ohio Universities College of Medicine by their faculty. Prereq.: Organic chemistry and permission of instructor. 3 q.h.

990. *Thesis*. Hours arranged. 1-9 q.h.

991, 992, 993, 994, 995, 996. *Special Topics*. Topics selected by the staff from fields of current research interest or fields of special emphasis. 991 Analytical; 992 Biochemistry; 993 Inorganic; 994 Organic; 995 Physical; 996 Clinical. Each may be repeated for credit. 3 q.h.

998. *Seminar*. May be repeated up to 2 q.h. 1 q.h.

## CIVIL ENGINEERING

Jack D. Bakos, Jr., *Chair of the Department*  
267 Engineering Science Building  
(216) 742-3027

829. *Civil Engineering Materials, Concrete* (4 q.h.)

859. *Reinforced Masonry Design* (4 q.h.)

877. *Systems Engineering* (4 q.h.)

879. *Civil Engineering Analysis* (4 q.h.)

880. *Advanced Structural Analysis* (4 q.h.)

884. *Solid and Hazardous Waste Management* (4 q.h.)

910. *Advanced Strength of Materials*. The basic methods of structural mechanics, such as conditions of equilibrium and compatibility, stress-strain relations. General treatment of energy principles including virtual work, minimum potential energy; applications to statically determinate and indeterminate systems such as rings, curved beams, plates, and other elastic systems.

4 q.h.

917. *Open Channel Hydraulics*. Analysis and design of open channels for uniform and nonuniform flow; hydraulic jump analysis; boundary layer and roughness effects; flow over spillways; flow in channels of nonlinear alignment and nonprismatic section.

4 q.h.

941. *Structural Mechanics*. Study of beams under lateral load; beams with combined lateral load and thrust; buckling beams on elastic foundations; applications of Fourier series and virtual work principles to beam-type structures; stress and strain in three dimensions; applications to flexure of beams and plates and to constrained torsion; elements of engineering theory of plates.

4 q.h.

945. *Civil Engineering Analysis*. Applications of mathematical and numerical methods to the systematic analysis and development of problems in the field of civil engineering.

4 q.h.

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946. *Matrix Analysis of Structures*. Introduction to matrix algebra; use of matrix methods in the analysis of statically and kinematically indeterminate structures; flexibility and stiffness methods. 4 q.h.

947. *Finite Element Analysis*. An introduction to finite element techniques as applied to problems in structural mechanics. Direct and variational methods of element formulation with application to beams, beam-columns, frames, arches, thin plates, and shells. 4 q.h.

950. *Pavement Management Systems*. Concepts and principles of pavement design, performance, evaluation, maintenance, rehabilitation, and their integration into a pavement management system (PMS). A PMS software package developed by several state highway agencies will be utilized, and a small PMS using Data Base Management System (DBMS) and Knowledge Based Expert System (KBES) will be developed. 4 q.h.

951. *Construction Project Control*. Advanced topics of Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM), and its application in construction project scheduling. Resource allocation and leveling, construction cost control, computer simulation of construction operations, and expert systems in construction. 4 q.h.

952. *Advanced Foundation Engineering*. Principles of mechanics of materials applied to foundation problems; stresses and deformations in soils, consolidation theory; shallow and deep foundations. 4 q.h.

953. *Flow Through Porous Media*. Analysis of seepage volume and stresses due to flow of water through soils in connection with dams, slopes, excavations, subsurface drainage and wells. 4 q.h.

954. *Theory of Plates*. Derivation of the classical equations and boundary conditions of thin plate analysis. Static and dynamic load analysis of rectangular and circular plates utilizing classical techniques, finite difference methods, and finite element methods; linear and nonlinear buckling characteristics using energy techniques. Prereq.: CE 941 or 910. 4 q.h.

955. *Theory of Shells*. Basic equations and boundary conditions of thin shell theory including both membrane and bending theories. Static and dynamic load analysis of shells of revolution including cylindrical, conical, and spherical shapes; linear and nonlinear buckling theory of shells. Prereq.: CE 954. 4 q.h.

956. *Advanced Soil Mechanics*. Development of shear strength theories, Mohr-Coulomb-Hvorslev equation, critical path concept, stability of slopes, lateral earth-pressure theories, development of bearing capacity equations. Prereq.: CE 881 or equivalent. 4 q.h.

957. *Structural Stability*. A study of the elastic stability of engineering structures, beam columns, static buckling of elastic beams, frames, plates, and shells, dynamic stability of beams and plates. 4 q.h.

958. *Structural Dynamics*. Analysis of the response of structures to air blasts and earthquake motions; development of both the normal mode and frequency response methods in dealing with periodic and non-periodic excitations. 4 q.h.

959. *Advanced Metal Design*. Advanced topics in the structural design of girders, frames and trusses. Light gauge metal structures. Use of modern alloys and hybrid systems. 4 q.h.

961. *Advanced Concrete Design*. Consideration of advanced design techniques for reinforced concrete members and structures such as composite and prestressed concrete beams and box girders, lift slabs, folded plates and shells. 4 q.h.

963. *Earthquake Engineering*. Fundamentals of earthquake engineering; response of linear and nonlinear structural systems to earthquake loadings; behavior of structural components to earthquake loadings; concepts of earthquake-resistant design applied to typical engineering structures. Prereq.: CE 958. 4 q.h.

965. *Special Topics*. The application, in civil engineering, of special topics selected by the faculty from fields of current research interest or special emphasis. May be repeated up to 8 q.h. 4 q.h.

966. *Air Pollution Control*. Sources of air pollution. Effects of air pollution, air pollutants, and plume dispersion. Air pollution control methods and equipment to include monitoring techniques. 4 q.h.

967. *Theory and Design of Sewage Systems and Sewage Treatment Plants*. Theory of the various procedures and techniques utilized in the treatment of sewage. Design of sewage treatment facilities. 4 q.h.

968. *Industrial Waste Treatment*. Methods of control of pollution from industrial sources. Neutralization, equalization, and proportioning of wastes. Joint treatment of industrial wastes with municipal waste. Major industrial wastes and their treatment. Prereq.: CE 837 or equivalent. 4 q.h.

969. *Sanitary Engineering Laboratory*. Theory and methods for chemical analysis of water, sewage, and industrial wastes. 4 q.h.

970. *Solid Waste Management*. Sources of solid waste. Collection and transport of solid wastes. Processing techniques. Disposal methods. Recovery and conversion of solid wastes. Hazardous waste and their management. Prereq.: CE 736 or equivalent. 4 q.h.

971. *Stream Pollution Control*. Biological and hydrological aspects of stream pollution control. Stream reaeration. Oxygen sag analysis. Efficient use of waste assimilation capacity. Prereq.: CE 837 or equivalent. 4 q.h.

972. *Advanced Studies in Environmental Engineering*. Current topics in physical, chemical, and biological treatment of water and wastewaters, air and land pollution control methods. Three hours lecture and three hours laboratory. Prereq.: CE 837 or equivalent. 4 q.h.

973. *Intermediate Fluid Mechanics*. Fluid properties. Basic laws for a control volume. Kinematics of fluid flow. Dynamics of frictionless incompressible flow. Basic hydrodynamics. Equations of motion for viscous flow, viscous flow applications, boundary layer theory. Unsteady flow. 4 q.h.

974. *Environmental Systems Engineering*. Principles of systems approach in formulating and analyzing environmental problems and design of pollution control facilities. (This course involves extensive use of computers.) Prereq.: CE 837 or equivalent and knowledge of Fortran programming. 4 q.h.

975. *Theory and Design of Water Treatment Processes*. Theory of the various procedures and techniques utilized in the treatment of water for municipal and industrial use. Review of water quality criteria. Design of water purification facilities. 4 q.h.

976. *Design of Small Dams*. Flood routing, reservoir engineering. Hydraulic design of small gravity, earth-fill and rock-fill dams, spillways, and energy dissipators. Prereq.: CE 717, 775, or equivalents. 4 q.h.

977. *Advanced Hydrology*. Snow accumulation, melt and runoff; urban and small watershed hydrology; hydrologic design; digital simulation of hydraulic phenomena; critical review of current pertinent literature. Prereq.: CE 775, IE 642, or equivalents. 4 q.h.

978. *Water Resources Planning*. The need and demand for water; project formulation; technical, economic, financial, social, environmental, and political considerations; data requirements; multi-purpose projects. Prereq.: IE 724 or equivalent. 4 q.h.

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979. *Water Quality Modeling*. Approaches to mathematical modeling of physical, chemical, and biological processes in natural systems; development of computer models to simulate the fate and transport of pollutants in lakes, streams, and estuaries; application of models to evaluate water resource management options. Prereq.: CE 736 or equivalent and background in computer programming. 4 q.h.

989. *Graduate Projects*. Special projects, to include analysis, design, research or other independent investigation, undertaken by the M.S. student under the direction of a graduate faculty member with the approval of the department chair. Credit will be determined in each case in the light of the nature and extent of the project. 1-4 q.h.

990, 991, 992. *Thesis*. 3+3+(1-3) q.h.

## COUNSELING

Ronald J. Richards, *Chair of the Department*  
2064 Fedor Hall  
(216) 742-3257

821, 822. *Seminar in Guidance and Counseling* (1-4 q.h., 1-4 q.h.)

825. *Group Processes in the School* (3 q.h.)

862. *Principles of Interaction with Special Needs Students* (Spec. Ed. 862) (3 q.h.)

879. *Counseling with Gifted/Talented Students and Their Families* (4 q.h.)

960. *Guidance and Counseling Professional Orientation*. Introduction to counseling and guidance as a professional career area. Consideration of student's awareness of own interest, value and aptitude profiles as well as employment outlook, legal issues, ethical standards and professional organizations for counselors. Includes a review of the student's proposed academic program in relation to career goals. 1 q.h.

961. *Introduction to Pupil Personnel Services*. Introduction to purposes and practices of pupil-personnel services in elementary and secondary schools. History of pupil-personnel services and current developments. An analysis of the contribution of related disciplines, in particular psychology, sociology and economics. The relationship of the services to community mental health and social agencies. 3 q.h.

962. *Counseling: Principles, Theory, Practice*. Basic principles of counseling in an educational context. Development of procedural bases for counseling and educationally-oriented counseling theory. Ethics and limitations involved in counseling practices. 3 q.h.

963. *Occupational and Educational Information in Guidance*. Principles of career development and use of educational and occupational information resources in the guidance program. Lecture and discussion are used to explore occupational structure of the United States; sources of educational and occupational information including community resources; and the collecting, classifying, filing, and organization of educational and occupational information for use in the guidance program. 3 q.h.

964. *Measurement and Assessment Techniques*. Administration, scoring and interpretation of standardized tests and measures related to guidance and counseling in the school setting. 3 q.h.

965. *Applied Testing in Career Counseling*. The administration, scoring and interpretation of selected assessment tools and their application to career counseling. Prereq.: Coun. 964. 3 q.h.

966. *Career Guidance Workshop*. Selected topics of interest in the areas of career education and career guidance. May be repeated for different topics. 1-5 q.h.



967. *Guidance and Counseling Workshop*. Selected topics of interest chosen by staff. May be repeated for different topics. 1-5 q.h.

968. *Applied Research and Development in Counseling*. The study and application of research and development techniques in counseling. Each student will be required to conduct a research and/or development project of his/her choice. 3 q.h.

969. *Administration of Personnel and Guidance Services*. A comprehensive study of the dynamic qualities inherent in planning, management, functioning, and structuring of personnel and guidance services in public schools. 3 q.h.

970. *Guidance Services in Elementary, Junior High, and Middle Schools*. The study of guidance services provided in elementary, junior high, and middle schools. This includes individual and group testing methods, vocational guidance, counseling, counselor-parent relationships, referral procedures, guidance of the disadvantaged and exceptional child, and the development of elementary, junior high, and middle school guidance programs. 3 q.h.

971. *Human Relations for the Classroom*. (see Admin. & Sec. Ed. 971) 3 q.h.

972. *Career Counseling*. Theories of vocational choice, vocational success and satisfaction, decision-making, and vocational testing. Career counseling as related to the economic and social context. Prereq.: Coun. 964. 4 q.h.

973. *Group Counseling Theory*. A study of theories pertaining to group dynamics, process, interaction, consultation and counselor intervention. Prereq.: Coun. 960, 962. 3 q.h.

973A. *Group Counseling Practice*. An experiential introduction to the dynamics of counseling groups. Students will participate in a group experience involving the total class and/or subdivisions of the class. Emphasis will be placed upon the facilitation of groups and the implementation of consultation skills. Prereq.: Coun. 973. 3 q.h.

974. *Case Studies in School Guidance and Field Experience in Community Social Agencies*. Methods of collecting data, synthesis, and interpretation of data about a person and relationship to environment. Real and assumed situations of pupils over an extended period of time are presented for study and analysis. The course includes practical field experience with various community social agencies to acquaint the student with agency services and social case-work methods. Particular emphasis is placed on the disadvantaged and exceptional child. 3-6 q.h.

975. *Counselor Consultation*. A study of theoretical models of the consultation process in counseling will be presented together with techniques for implementation in educational and agency settings. 3 q.h.

976. *Social and Cultural Issues in Counseling*. Counseling theory and technique related to social and economic change, ethnic groups, subculture, issues of sexuality and gender, urban and rural societies, cultural mores, the use of leisure time and differing life patterns. 3 q.h.

990. *Independent Study*. (see Elem. Ed. 990) 1-4 q.h.

1005. *Internship in College Student Personnel Work*. Supervised experience in selected college or university settings with involvement in such areas as student development, counseling center, placement center, residence hall counseling, student advisement and student activities. Prereq.: Permission of instructor. 6-12 q.h.

1006. *Guidance in the Classroom*. Studies various factors important to a facilitative climate in the classroom and activities through which elementary counselors and teachers can provide these conditions. Considered as class-room management and discipline techniques based upon learning theory, implementation of democratic group structure for elementary school classrooms, and organized activities designed to promote the development of self understanding and



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understanding of others in the child's world. The course requires extensive reading and review of published materials designed for classroom guidance, in addition to observation of classrooms and role-playing experiences. 3 q.h.

1007. *Practicum for Visiting Teachers*. Visiting teacher practice under supervision; the final required course in the preparation of the visiting teacher, open to advanced students who are completing their work for the visiting teacher certificate. Internship experiences in neighboring elementary and secondary schools. A review of community organizations; field experiences in social agencies; seminar work in case studies. Prereq.: Permission of instructor. 6-9 q.h.

1009. *School Counseling Internship*. Counseling practice under supervision; the final required course in the preparation of the school counselor. Open to advanced students who are completing their work for the school counselor certificate. Supervised counseling internship for one quarter in a school guidance program. Prereq.: Permission of instructor. 6-12 q.h.

1010. *Counseling Internship*. Supervised experience in selected community agencies offering counseling and other guidance services. Prereq.: Permission of instructor. 6-12 q.h.

1011. *Clinical Counseling Practice I*. A practical application of communication and observation skills along with interviewing techniques as they relate to the counseling process. Emphasis will be placed upon counselor self-awareness and evaluation in conducting a series of initial interviews. Prereq.: Coun. 962 and permission of instructor. 3 q.h.

1012. *Clinical Counseling Practice II*. A continuation of Coun. 1011 with expanded focus upon counseling as an ongoing process which includes the clarification of counselee goals and the development of procedures to aid in goal accomplishment. Prereq.: Coun. 1011 and permission of instructor. 3 q.h.

1013, 1014, 1015. *Topical Seminar in Counseling*. The course is for practicing counselors and counselor trainees and will include a survey of literature in counseling, contemporary issues, individual and small group study of special problems chosen by staff, for example: research in counseling, counselor values and the counseling process, student values and drug abuse, team approach to counseling services, etc. May be repeated to a maximum of 16 q.h. Prereq.: Permission of instructor. 1-4 q.h.

1017. *Group Procedures in Counseling*. A laboratory course intended as an experimental introduction to dynamics of groups. Students will participate in community experiences involving the entire class as well as small group activities involving subdivisions of the class. Readings on group processes and involvement in relevant projects and reports are also included in the course. Prereq.: Permission of instructor. 3 q.h.

1026. *Student Personnel Programs in Higher Education*. Philosophy and objectives of student personnel programs. A review of services provided by the student personnel worker, relationships among the various college departments relative to student personnel services, and problems concerning student conduct and responsibilities. 4 q.h.

1027. *Issues in College Student Personnel Work*. An examination of current issues as related to student personnel services at the level of higher education and student involvement in university activities. 4 q.h.

1028. *Advanced Counseling Theory Seminar*. Research and discussion on selected counseling theories chosen by staff, e.g., Adler, Rogers, Ellis, Carkhuff, Berne. May be repeated once. Prereq.: Coun. 962. 3 q.h.

1030. *Human Relations Training for School Personnel*. (Elem. Ed. 1030, Admin. & Sec. Ed. 1030). Designed to improve the interpersonal relationships of administrators, counselors, teachers and other professional staff. Objectives include examination of personal communication styles, the effect of the individual on task groups and increasing leadership potential. 3 q.h.

1031. *Clinical Counseling Theory*. Counseling theories of abnormal behavior and pathological conditions related to the total life cycle. Included will be specific personality theories and then application to mental health counseling. Prereq.: Master's degree in Counseling or permission of instructor. 3 q.h.

1032. *Clinical Evaluation I*. Assessment procedures related to diagnosis and treatment planning. Emphasis is placed on methods of administering and interpreting individual and group standardized tests of mental ability, interest, aptitude, personality and achievement. Prereq.: Master's degree in Counseling or permission of instructor. 3 q.h.

1034. *Practicum in Clinical Evaluation*. Supervised practice in the administration and interpretation of standardized ability, interest, achievement, aptitude and personality instruments. Prereq.: Coun. 1032. 3 q.h.

1036. *Consultation and Educational Approaches to Prevention*. The study of consultation theory and models. Included will be educational approaches to prevention of substance abuse, child abuse, family and marriage problems, etc. Prereq.: Master's degree in Counseling or permission of instructor. 3 q.h.

1037. *Counseling Methods of Intervention and Prevention*. Study of intervention and prevention strategies such as client-centered, psychoanalytic, hypnotic, rational-emotive, reality and psychosocial approaches. Specialized intervention techniques needed for diverse populations, e.g., minorities, substance abusers, physically and mentally disabled and terminally ill. Prereq.: Master's degree in Counseling or permission of instructor. 3 q.h.

1038. *Marriage and Family Counseling*. Intervention and prevention strategies related to marriage and family problems, crisis situations, rehabilitation and child abuse. Prereq.: Master's degree in Counseling or permission of instructor. 3 q.h.

1039. *Administration and Supervision of Mental Health Services*. A comprehensive study of management, planning, function, personnel structuring, supervision and counseling services in a mental health setting. Prereq.: Master's degree in Counseling or permission of instructor. 4 q.h.

1041. *Clinical Counseling Practice III*. Laboratory experience in the evaluation and treatment of mental and emotional disorders; including the development and implementation of a treatment plan, assessment and reporting of treatment program, and referral procedures. Prereq.: Master's degree in Counseling or permission of instructor. 3 q.h.

1050. *Clinical Counseling Internship*. Supervised experience in selected community agencies offering diagnosis and treatment of mental and emotional disorders. Prereq.: Master's degree in Counseling or permission of instructor. 6-12 q.h. (may be repeated)

## CRIMINAL JUSTICE

A. Bari Lateef, *Chair of the Department*  
2087 Cushwa Hall  
(216) 742-3279

- 825. Constitutional Issues in Criminal Law (4 q.h.)
- 826. Forensic Science and the Criminal Justice System (4 q.h.)
- 848. Legal and Managerial Aspects of Security (4 q.h.)
- 850. Contemporary Problems in Criminal Justice (4 q.h.)
- 875. The Juvenile Justice System (4 q.h.)
- 890. Judicial Administration (4 q.h.)

## 78 COURSES

910. *Law and Social Control*. An historical analysis of the evolution of criminal law as a mechanism of social control in democratic societies. 4 q.h.
915. *The Etiology of Crime*. A comprehensive analysis of the causes of crime. Major criminological theories are considered in light of contemporary empirical research and social thought. 4 q.h.
920. *Social Administration of Criminal Justice*. An historical and comparative analysis of the administration of the criminal justice process in theory and practice in the United States and other selected nations. 4 q.h.
925. *Administrative Theory in Criminal Justice*. Administrative relationships in criminal justice organizations. The functions of the executive, the nature of authority and leadership, the systemic relationships of the subsystems, communications and the evolution of administrative theory as applied to the criminal justice setting. 4 q.h.
940. *Statistical Techniques in Criminal Justice Research*. A consideration of the sources of statistical information in the criminal justice system and the limits of such data, with primary emphasis upon nonparametric statistics and their application to the field. 4 q.h.
945. *Research Methods in Criminal Justice*. Problems in the design and execution of criminal justice research; the development of research design of the kind most useful to criminal justice research problems. Prereq.: CJ 940. 4 q.h.
950. *Specific Problems in Criminal Justice*. Lectures on specific topics relating to the crime problem and the criminal justice process. The topics may vary from quarter to quarter and will be announced prior to enrollment. This course is repeatable twice provided it is on different topics. 4 q.h.
955. *Independent Study*. Study under the personal supervision of a faculty member with the approval of the graduate coordinator. May be repeated once. 4 q.h.
957. *Readings in Criminal Justice*. Extensive reading assignments in the student's interest area under the supervision of the graduate advisor. Enrollment in this course must have the written approval of the graduate coordinator. May be repeated for no more than a total of 8 q.h. 1-5 q.h.
960. *Program Planning and Evaluation*. A systematic review of procedures used to plan and evaluate criminal justice programs, with special attention to the posing of research questions in context; questions relating to the selections of designs, methods, and process of formative and summative evaluation and assessing the effectiveness of the experiments. 4 q.h.
970. *Police Management Theory*. Systematic examination of the principles and practices related to the management of large police organizations. Examples will reflect problems of the urban environment, relationships with political entities, and internal control. 4 q.h.
971. *Police Personnel Systems*. Evaluation of police personnel systems; employment qualifications, psychiatric screening, polygraph examination, minority recruitment; police cadet systems, personnel costs, educational requirements, lateral entry, mandated state minimum training standards and federal involvement in police manpower. 4 q.h.
972. *Special Problems in Police Administration*. Emphasis on contemporary management dilemmas in police organizations; policy formulation, team policing, community relations, consolidated law enforcement, discipline, education and training, professionalism, selective enforcement, corruption, and related problems. 4 q.h.
980. *Institutional Correctional Systems*. Modern theories of corrections in the institutional setting as considered in light of historical development and social change. 4 q.h.

981. *Non-Institutional Correctional Systems.* Analysis of the delivery systems used in the reduction of criminal behavior in the community setting. Emphasis will be placed on diversion programs, current literature and innovative experiments. 4 q.h.
982. *Treatment Approaches in Corrections.* An in-depth analysis of the theories of rehabilitation as applied in the correctional setting. 4 q.h.
995. *Field Experience in Criminal Justice.* Supervised experience in an applied criminal justice setting. Not applicable to degree. 6 q.h.
999. *Research and Thesis.* 1-9 q.h.

## ECONOMICS

Anthony H. Stocks, *Chair of the Department*  
321 DeBartolo Hall  
(216) 742-3428

801. Economics of Industrial Organization (4 q.h.)
802. Comparative Economic Systems (4 q.h.)
803. Business and Government (4 q.h.)
804. The Economics of Central Planning (4 q.h.)
805. Business Cycles and Economic Growth (4 q.h.)
806. History of Economic Thought (4 q.h.)
809. Current Problems in Money, Banking and Financial Markets (4 q.h.)
810. Managerial Economics (4 q.h.)
811. International Trade (4 q.h.)
812. International Finance and Economic Development (4 q.h.)
817. Economics of Transportation (4 q.h.)
820. Regional Economic Analysis (4 q.h.)
821. Location Theory (4 q.h.)
822. Urban Economics (4 q.h.)
824. Applied Time Series Analysis of Economic and Business Data (4 q.h.)
825. Economic and Business Data Analysis (4 q.h.)
831. Labor Markets (4 q.h.)
850. Introduction to Decision Analysis (4 q.h.)
853. Applied Econometrics (4 q.h.)
900. *Statistical Problems.* A survey of the fundamental statistical concepts and techniques used in business and economics with special emphasis on the interpretation and uses of statistical analysis in business and economic decision-making. These statistical procedures include hypothesis testing and estimation, chi-square tests and analysis of variance, correlation and regression analysis, index numbers, economic time series, nonparametric statistics, and decision analysis. (Not applicable toward the MBA or MA in Economics degrees.) 4 q.h.
901. *Basic Economic Analysis.* An analytical approach to the basic concepts of micro and macroeconomics with emphasis on the interpretation and application of these concepts to the firm and to the economy. (Not applicable toward the MBA or MA in Economics degrees.) This course is especially designed for professionals in business and other related areas. (Formerly 935) 5 q.h.
902. *International Economic Analysis.* Analysis of the causes and consequences of international trade, exchange rates and balance of international payments adjustment. Capital flow and problems of international liquidity. Exchange speculation and the forward exchange market. Study of various commercial and financial policies and their economic implications. Theory and development of international regional economic intergration and their worldwide consequences. (Not applicable toward a MA in Economics degree.) Prereq.: Graduate standing. 4 q.h.



905. *Introduction to Mathematical Economics*. A course designed to provide graduate students in Economics with an opportunity to acquire the necessary skills in using the quantitative methods which are required to successfully complete and graduate-level economic theory sequence. 4 q.h.

907, 908, 909. *Economics for Teachers I, II, III*. An examination of the major economic issues and problems of our society and the use of applicable economics theory for their solution. Meetings with representatives of various institutions of our society are included in order to relate the issues and theory to present day society. (Intended for elementary education students.) Prereq.: 907 for 908; 908 for 909. (Formerly 930, 931, 932) 3+3+3 q.h.

910, 911. *Microeconomic Theory I and II*. Theories of consumer behavior and the firm; the determination of product and factor prices under varying market structures; capital theory and welfare economics; study of static and dynamic conditions of multi-market stability; applications of microeconomic concepts. Offered Winter and Spring quarters. 4+4 q.h.

915. *Health Economics*. A theoretical and empirical analysis of the health care sector. Topics include the following: demand for health care and health insurance, the perverse incentives of health insurance, moral hazard, physician and hospital behavior, the role of competitive markets in the delivery of health care. Special emphasis is placed on the analysis of public policy including financing and regulating the health care industry. Prereq.: Econ. 901. 4 q.h.

920, 921. *Macroeconomic Theory I and II*. Study of aggregated economic variables to determine the proper policy mix needed to obtain the economic goals of full employment, stable price levels, etc. Investigation of dynamic modern post-Keynesian macroeconomic models as influenced by classical and neo-classical developments. Offered Fall and Winter quarters. 4+4 q.h.

926. *Aggregative Economics for Business Decision Making*. An analysis of macroeconomic behavior and its impact on business. Topics include: determination of aggregate output and income; consumer expenditure theory; investment analysis; fiscal and monetary policy implications for business; forecasting models and application; international trade issues. Considerable stress is placed on providing students with information on the sources of macroeconomic information. (Not applicable toward a MA in Economics degree.) Prereq.: Econ. 901 or equivalent. 4 q.h.

940. *Monetary Theory I*. A survey of the important theoretical and empirical works in monetary theory. The first of a two course sequence, the topics covered include the classical model, the Keynesian-Monetarist debate, the demand for money, the supply of money, rational expectations, potential output. Prereq.: Econ. 705, 900 or 976; 920. 4 q.h.

941. *Monetary Theory II*. A survey of the important theoretical and empirical works in monetary theory. The second of a two-course sequence, the topics covered include monetary control, portfolio theory, and financial firms as optimizing enterprises. Prereq.: Econ. 940. 4 q.h.

945. *Theory of Federal Finance*. A theoretical analysis of the effects of various federal policies upon the allocation of resources, distribution of income, level of employment, and rate of economic growth. Investigation of theories of taxation and public expenditure criteria. 3 q.h.

946. *Theory of State and Local Finance*. A theoretical and empirical investigation of state and local taxation and expenditure criteria, tax bases and incidence, problems of finance unique to local governmental units. 3 q.h.

950. *Theory of the Labor Market*. Intensive study of topics related to the problems and general performance of the various segments of the labor market in a free industrial society within a theoretical framework. 3 q.h.

951. *Issues in Collective Bargaining and Arbitration*. Intensive study and theoretical analysis of topics related to contemporary issues in collective bargaining. 3 q.h.



955. *Industrial Structure*. Comparison of the economic characteristics of industries: growth, technology, concentration, scale economies, geographic concentration, competition, and market structure. Theoretical and empirical comparisons. 3 q.h.

975. *Quantitative Methods for Economics*. A continuation of the analysis of calculus of one and several variables, difference and differential equations, vectors and matrices and linear programming as applicable to the static and dynamic models in micro and macroeconomic theory. Prereq.: Econ. 709 or equivalent. (Formerly 905) 3 q.h.

976. *Econometrics*. Probability distributions and properties of estimators, alternative methods of estimating parameters. Analysis of linear regression model of two variables including problems of estimation, hypothesis testing and forecasting. Extension of the linear model to three and in general to 'n' variables. The course combines rigorous theoretical presentation with exercises in modelbuilding. Prereq.: Econ. 705, 900 or equivalent. Offered Spring quarter. 4 q.h.

981. *International Finance*. Analysis of balance of payments adjustment mechanisms and exchange rate determination. The effects of the international economy of domestic levels of employment, prices, interest rates and growth. Emphasis is placed on the study of the elasticity, absorption, monetarist-rational expectations, and exchange intervention models. Prereq.: Econ. 920.4 q.h.

983. *Regional Economic Integrations*. Regional economic integrations and their theoretical, domestic and world wide economic implications. Analysis of the structure, purpose and international effects of some major regional economic integrations as the European Economic Community (the Common Market), the European Free Trade Association (EFTA), the Organization for Petroleum Exporting Countries (OPEC) . . . The role of the United States in developing several international economic organizations. Prereq.: Econ. 901 or equivalent. 4 q.h.

985. *International Trade*. A theoretical and empirical investigation into the determinants of the commodity composition of trade between nations. The effects of commodity trade on the welfare of nations. The effects of tariffs and trade restrictions on the commodity composition of trade and the welfare gains from trade. Prereq.: Econ. 910. 4 q.h.

990. *Special Topics in Economics*. Special interest topics selected by the staff in the following areas: economic education, economic theory, and applied economics analysis. May be repeated up to a maximum of 9 hours toward a graduate degree. 1-5 q.h.

999. *Master's Thesis*. May be repeated twice. 3 q.h.

## EDUCATIONAL ADMINISTRATION

Vacant, *Chair of the Department*  
Fedor Hall

908. *Computer Applications for Administrators*. An introduction to the techniques and principles of microcomputer applications for administrators. Emphasis will be placed on student, personnel, financial, facilities, equipment, library, planning, and office microcomputer applications. Prereq.: Ed. 889. 3 q.h.

947. *Basic Principles of Elementary School Administration*. Investigation and study of the general problems of administration in the elementary school. 3 q.h.

948. *Basic Principles of Secondary School Administration*. The role of the secondary school principal in general administrative techniques. 3 q.h.

949. *School Law*. Principles of constitutional, statutory, case, and common law affecting Ohio schools as they apply to the political subdivision of the school district and the administrative, line, and staff personnel; legal provisions and principles relating to education at all levels. 3 q.h.

950. *School Business Management*. The principal's responsibility for school management problems including activity fund accounting, purchasing, budgeting, building maintenance, pupil insurance and related areas. 3 q.h.

952. *School Finance*. A study of the fiscal setting of public school finance in the United States, with particular emphasis on the State of Ohio. It will analyze systematic approaches to local, state, and federal financing of schools, including accounting, budgeting, purchasing, and funding for the operation of public schools. 3 q.h.

954. *School Community Relations*. A course designed to develop competency in the techniques of planning, administering and evaluating effective programs of school/community relations. 3 q.h.

955. *Staff Personnel Administration*. Policies and practices of personnel administration. Recruitment, selection, assignment, and supervision of teaching and non-teaching personnel. Salary schedules and other employee rewards. Policies for career development. Handling of grievances and negotiations. 3 q.h.

956. *Educational Facilities*. A course designed to familiarize the prospective administrator with the problems of new plant development and maintenance remodeling, rehabilitation of current plants, and the selection and maintenance of equipment. Some classes will be held in various locations off campus. 3 q.h.

987. *Organization and Administration of Extracurricular Programs*. Principles, issues and practices involved in developing, administering, and evaluating co-curricular programs in elementary and secondary schools. For teachers and administrators. 3 q.h.

988. *Evaluation of Educational Institutions*. Evaluation of educational institutions using current techniques and criteria; to include field applications. For teachers and administrators. 3 q.h.

1021. *Field Experience I*. (Spec. Ed. 1021) A field experience in administrative and supervisory practices required for the master's degree in educational administration. Admission by permission of chair of Educational Administration. Prereq.: Ed. 904, 946, 949, 955, 1031, and 1036. 3 q.h.

1022. *Field Experience II*. A field experience in administrative practices for elementary and secondary principalship, school business managers, and assistant superintendents. Admission by permission of chair of Educational Administration. Prereq.: M.S. in Educational Administration and Ed. 816 and 881 or 934; 908; 916 or 931; 947 or 948; 950; and 988. 3 q.h.

1023. *Field Experience III*. A field experience in administrative practices required for superintendent's certification. Admission by permission of chair of Educational Administration. Prereq.: M.S. in Educational Administration, completion of Y.S.U. requirements for principalship certification and Econ. 946, Ed. 956, 1024, 1035, 1041 and two of the following: Ed. 901, 902, 905. 3 q.h.

1024. *Seminar in Secondary Education*. Study of selected topics chosen by the secondary staff. May be repeated by non-degree students. Prereq.: Permission of instructor. 1-6 q.h.

1031. *Theories of Educational Administration*. Theories relevant to public school administration. The role of theory in development of leadership, management skills, and decision-making. Emphasis includes research in theory-building and converting theory to practice. 3 q.h.

1033. *Theories of Change in Education*. Theories and research from education, business, the social and behavioral sciences. Emphasis upon theory and its relation to organization structure, roles, leadership, and resistance to change. Case studies will be analyzed from a theoretical framework. 3 q.h.

1034. *Implementing Change in Education*. Research based strategies to implement change in schools. Specific skills required of the *change-agent* are developed and practiced in simulated and field situations. Prereq.: Ed. 1033. 3 q.h.

1035. *The Superintendency*. The role of the superintendent in the administration of a public school system. Focuses on the major responsibilities of the board of education and the superintendent. Prereq.: Eligibility for certification as a principal or supervisor. 3 q.h.

1037. *Planned Field Experience in Instructional Service*. An administrative practicum open to advanced graduate students seeking specialist certification in instructional service. Prereq.: M.S. in Educational Administration, or equivalent thereof, and Ed. 916, 931, 933, 934, 946, 959, 988, 1031, and 1036. 3 q.h.

1038. *Planned Field Experience for Staff Personnel Administration*. An administrative practicum open to advanced graduate students seeking specialist certification in staff personnel administration. Prereq.: M.S. in Educational Administration, or equivalent thereof, and Ed. 909, 910, 921, 946, 951, 955, 959, 1024, 1030, 1031, 1032, and 1036. 3 q.h.

1039. *Planned Field Experience — School and Community Relations*. An administrative practicum open to advanced graduate students seeking specialist certification in school and community relations. Prereq.: M.S. in Educational Administration, or equivalent thereof, and Ed. 905, 911, 915, 921, 946, 951, 954, 984, 1030, 1031, and 1036. 3 q.h.

1041. *Field Experiences in School Plant Planning*. Field experiences in conducting a master facilities study for a school district. Analysis of school enrollments, evaluation of school plants. Financial and political aspects of plant planning (some classes will be held in various locations off campus). Prereq.: Ed. 956. 3 q.h.

## ELECTRICAL ENGINEERING

Salvatore R. Pansino, *Chair of the Department*  
276 Engineering Science Building  
(216) 742-3012

- 805. Quantum Electronics (4 q.h.)
- 807. Pulse, Digital, and Switching Circuits (4 q.h.)
- 808. Electronic Circuits, Signals, and Systems (4 q.h.)
- 812. Molecular Engineering (4 q.h.)
- 816. Theory and Fabrication of Solid-State Devices (4 q.h.)
- 819. Plasma Dynamics (4 q.h.)
- 825. Sequential Logic Circuits Analysis and Design (3 q.h.)
- 825L. Combinational and Sequential Circuits Laboratory (1 q.h.)
- 826. Advanced Logic Circuits Analysis and Design (3 q.h.)
- 826L. Advanced Logic Circuits Laboratory (1 q.h.)
- 840. Electric Power Systems (4 q.h.)
- 850. Communications Systems II (4 q.h.)
- 860. Energy Radiation and Propagation (4 q.h.)

879. Computer-Aided Design of Electrical Networks and Systems (4 q.h.)
880. Linear Control System Design (4 q.h.)
881. Modern Control System Design (4 q.h.)
901. *Control Systems I*. Analysis of linear systems, characteristics of linear systems, analogous systems, development and application of Laplace and other transform methods. Systems with feedback, systems with distributed parameters. 4 q.h.
902. *Control System II*. Linear feedback systems theory. Stability criterion. Synthesis in complex and time domain. Multivariable systems, (multiple input-output) and multiple loop systems with emphasis on state variable and matrix techniques. Analysis and design of carrier systems. 4 q.h.
903. *Nonlinear Control Systems Analysis*. Introduction to basic non-linear phenomena and methods. Stability concepts for feedback loops. Study of time-varying nonlinear feedback systems including free and forced responses. Circle criterion, Papov's criterion. O'Shea criterion, and other frequency domain stability criteria. Lyapunov stability theory. O'Shea's response bound theorems. 4 q.h.
- 911, 912. *Electromagnetic Fields I and II*. Solution of boundary value problems in general form. Laplace, Poisson, and diffusion and wave equations in orthogonal coordinate systems. 4+4 q.h.
921. *Quantum Electronic Devices*. Electronic energy levels in quantum electron devices; application of energy transitions to semi-conductors, masers, and lasers. Analysis of energy of atomic gases as applied to gas lasers. Crystal structure of solid-state maser and laser materials. 4 q.h.
925. *Physical Properties of Crystals*. The symmetry of crystals and its effect on physical properties, tensor analysis, dielectric and magnetic susceptibilities, elastic and piezoelectric properties, thermodynamics of crystals, transport properties, crystal optics, electromagnetic wave propagation in anisotropic media. 4 q.h.
931. *Digital Systems Engineering I*. Boolean algebra, logical mapping; combinational synthesis; analog and digital conversion; coding structures; hybrid numerical circuitry. Structures of combinational circuit synthesis; logical circuit methods of Quine, Huffman, Mealy, Moore; Boolean matrices, bilateral and cascade networks. 4 q.h.
932. *Digital Systems Engineering II*. Continuation of EE 931 with emphasis on sequential synthesis. Prereq.: EE 931 or permission of department chair. 4 q.h.
941. *Linear Electronic Circuits*. Design of linear active circuits; amplifier analysis and synthesis; feedback amplifiers; stability; integrated circuits; transfer functions; synthesis methods; noise determination and reduction. 4 q.h.
951. *Network Analysis*. The analysis of time and frequency domain response of networks using transform and state variable techniques. Matrix methods, modeling, topological properties, and signal-flow analysis techniques. 4 q.h.
954. *Network Synthesis*. A study of realization procedures for driving point and transfer function synthesis of networks. Concepts of positive real functions, methods such as Foster, Caver, Brune, and Darlington. Approximation methods of Butterworth Tchebyscheff. 4 q.h.
960. *Seminar*. (May be repeated once.) 4 q.h.
981. *Modern Approach to Power Systems*. Modern approach to the study of energy transmission, protection, and control. Fault studies, control of generation, load flow studies employing the computer, and protection of system components employing modern type devices are investigated. 4 q.h.
990. *Thesis*. 1-9 q.h.

## ELEMENTARY EDUCATION AND READING

Janet L. Beary, *Chair of the Department*  
 1060 Fedor Hall  
 (216) 742-3251

814. Language Arts III (3 q.h.)
816. Diagnosis and Remediation of Elementary School Mathematics (3 q.h.)
881. Corrective Techniques in Reading (4 q.h.)
882. Developmental and Content Area Reading (3 q.h.)
883. Secondary School Reading (4 q.h.)
885. Teaching Strategies I (Admin. & Sec. Ed. 885) (3 q.h.)
886. Teaching Strategies II (Admin. & Sec. Ed. 886) (3 q.h.)
887. Teaching Strategies III (Admin. & Sec. Ed. 887) (3 q.h.)
888. Topical Seminar in Reading (1-4 q.h.)
890. Elementary Education Workshop (1-4 q.h.)
909. *Supervision of Student Teachers—Elementary*. Basic counseling and supervisory techniques associated with the acceptance of responsibility for inducting the teaching neophyte into his/her first real professional experience. Actual work with student teachers. 3 q.h.
911. *Early Childhood Programs*. A study of the historical background of early childhood intervention and an analysis and evaluation of contemporary early childhood programs in America, including latest research findings relevant to these programs. 3 q.h.
912. *Curriculum and Methods in Early Childhood Education*. Preparation of diversified materials, planning and organizing experiences appropriate to the young child's psychological, social, and perceptual development. Prereq.: Ed. 916. 4 q.h.
913. *Pre-School Education*. Formal and informal approaches to language development, perceptual and motor skills in the pre-school age child. Attention given to the role of parents as teachers of cognitive skills. 3 q.h.
914. *Practicum in Early Childhood Education*. A course designed to provide clinical experience with pre-school children. Observation of children in day-care centers, nursery schools, and in community social agencies which provide services to the young child. Also, a study of management aspects of child care centers, standards and certification requirements. Prereq.: Ed. 911, 912, 913 and 929. 4 q.h.
916. *The Elementary School Curriculum*. Developing an understanding of the meaning of curriculum at the elementary level, evidence of need for curricular changes, influences of society on curriculums, exploration of current status and trends; the role of teacher and administrator in curriculum appraisal and development. 3 q.h.
917. *Elementary School Reading Programs*. A critical appraisal and discussion of current research and traditional programs in the elementary school; goals, content, and problems faced by elementary administrators and teachers in the reading field. 3 q.h.
918. *Elementary School Mathematics Programs*. An analysis of past and present programs of elementary school mathematics; evaluation of programs including a consideration of adequacy of content, recognition of mathematics as a system, provision of number experiences for the learner. 3 q.h.



919. *Social Studies Programs in the Elementary School*. Objectives of elementary school social studies programs in terms of current needs; adaptation of materials of instruction in terms of the social science skills; evaluation of student progress; critical analysis of methods of improving instruction in social studies. 3 q.h.

920. *Elementary School Science Programs*. Focus on the objectives for science education in the elementary school; the elementary school science curriculum; process and inquiry in the elementary school science program; teacher education, educational media, and the evaluation of science teaching. 3 q.h.

921. *Issues, Problems, and Developments in Elementary Education*. A study of recent trends in elementary school organization and instruction (non-graded units, team teaching, middle schools, etc.). 3 q.h.

923. *Review of Reading Research*. Appraisal of research methods and design in the area of reading. The aim of this course is to determine how research has been effective in influencing change in reading instructors. Prereq.: Ed. 904 and 710. 4 q.h.

924. *Diagnosis and Treatment of Reading Disabilities: Part I*. Selection, administration, and scoring of various individual tests; techniques for evaluating the child with a reading disability. Prereq.: Permission of instructor and Ed. 882 and 883. 4 q.h.

925. *Diagnosis and Treatment of Reading Disabilities: Part II*. Instructional techniques and procedures for meeting specific needs of the child with reading disabilities. Work with specialized materials, machines, and other equipment used in reading improvement. Prereq.: Ed. 924 or permission of instructor. 4 q.h.

927. *Practicum: Reading*. Supervised experience in reading correction in area schools, clinics, or agencies. Prereq.: Ed. 925 or permission of instructor. 4 q.h.

929. *Language Arts in the Primary Grades*. An evaluation of the philosophy, principles, and practices of the language arts program in the primary grades. A special emphasis shall be placed in teaching language arts to disadvantaged children. 3 q.h.

930. *Supervision of Reading*. This course deals with the role of the supervisor of reading programs including the initiation and supervision of a reading program or programs in the elementary and secondary schools. Emphasis will be placed on selection of reading teachers; selection of reading materials; and the different types of programs that can be developed. Prereq.: Permission of instructor. 4 q.h.

938. *Early Adolescent Characteristics and Educational Program Needs*. Research and theories of the intellectual, physical, psycho-social, and moral development of 10–15 year olds and implications for designing appropriate educational programs. Includes field inquiry. Prereq.: Psych. 906. 4 q.h.

939. *Designing Middle Grade Environments, Curricula, and Instruction*. Application of theory and research to the design and analysis of middle grade organizational, curricular, and instructional structures and practices. Prereq.: Ed. 938. 3 q.h.

940. *Introduction to Middle Grade Math and Science Curriculum and Instruction*. Examines major theories of math and science to identify key principles in courses of study which increase early adolescents' understanding of how the world works into systems and fosters development of skills in choosing healthy life styles. Prereq.: Ed. 938. 2 q.h.

941. *Methods of Teaching Math and Science in Middle Grades*. This course will provide opportunities for teachers to analyze and increase their knowledge and skills in teaching math and science in middle grades. Continued analysis and implementation of teaching methods in math and science which advance adolescents' operational and critical thinking skills for clarifying and answering questions, solving problems, and making decisions. Prereq.: Ed. 940. 4 q.h.

942. *Introduction to Middle Grade Language Arts, Reading, and Social Studies Curriculum and Instruction.* Theory and research in language arts, reading, and social studies. Design of integrated middle grade curriculum and instruction. Field research component. Prereq.: Ed. 938. 3 q.h.
943. *Methods of Teaching Language Arts, Reading, and Social Studies.* Study of and experience in various teaching methods and classroom management strategies for implementing an integrated curriculum and effective instruction in language arts, reading, and social studies. Extensive field component. Prereq.: Ed. 942. 3 q.h.
990. *Independent Study.* (Coun. 990, Sec. Ed. 990) Individual investigation of advanced topics under guidance of selected staff. Prereq.: Ed. 904. 1-4 q.h.
1030. *Human Relations Training for School Personnel.* (see Coun. 1030) 3 q.h.
1042. *Professional Development for Classroom Teacher Educators.* A restricted professional development course for classroom teacher educators invited to supervise the instructional program of student teachers and field experience students. The course concentrates on developing analytical observation, conferencing, evaluation and supervision skills based on scientific knowledge and theoretical constructs. Prereq.: Invitation from YSU and endorsement from home school district to serve as a classroom teacher educator. 3 q.h.
1043. *Field Experience in Middle Grade Education.* Supervised field experience that incorporates theory planning and implementation of a curriculum for early adolescent development. Weekly campus seminar. Prereq.: Psych. 906, Ed. 935, 937, 938, 939, 940/941 or 942/943, 922 or 1036, 904, Coun. 825. 3 q.h.

## ENGLISH

Barbara H. Brothers, *Chair of the Department*  
202 DeBartolo Hall  
(216) 742-3415

820. *Advising Student Publications.* (May not be counted toward an MA in English.)
883. *Milton* (4 q.h.) (4 q.h.)
900. *Methods of Research.* Basic concepts and methods of literary research and analysis. 4 q.h.
902. *Literary Criticism and Literary Forms.* Critical theories and applications. 4 q.h.

### Area I

911. *Medieval British Literature.* Emphasis on works in Middle English dialects, including *Sir Gawain and the Green Knight*, *The Pearl*, *Piers Plowman*, and *Towneley Plays*, and secular lyrics. 4 q.h.
921. *16th Century British Literature.* Emphasis on the non-dramatic works of Spenser, More, Shakespeare, Marlowe, and Wyatt. 4 q.h.
923. *Elizabethan and Jacobean Drama.* Plays of Shakespeare's contemporaries such as Marlowe, Jonson, Chapman, Webster. 4 q.h.
1010. *Seminar in Chaucer.* 4 q.h.
1022. *Seminar in Shakespeare.* 4 q.h.

### Area II

925. *17th Century British Literature.* Emphasis on the non-dramatic works of Donne, Jonson, Herrick, Herbert, Browne, and Dryden. 4 q.h.

## 88 COURSES

930. *18th Century British Poetry and Prose*. Emphasis on Swift, Pope, Johnson, Cowper, Burns, and Blake. 4 q.h.

931. *18th Century British Novel*. Emphasis on Defoe, Richardson, Fielding, and Austen. 4 q.h.

1032. *Seminar in 17th and 18th Century British Literature*. (May be repeated once.) 4 q.h.

### Area III

935. *British Romantic Poetry and Prose*. Major works of Wordsworth, Coleridge, Byron, Shelley and Keats; short selections from Lamb, Hazlitt, and DeQuincey. 4 q.h.

936. *Victorian Poetry and Prose*. Includes Arnold, Tennyson, Browning, Carlyle, Ruskin, and Morris. 4 q.h.

937. *19th Century British Novel*. Development and trends from Scott to Hardy. Includes Dickens, Thackeray, Eliot. 4 q.h.

1038. *Seminar in 19th Century British Literature*. (May be repeated once.) 4 q.h.

### Area IV

941. *American Literature to the Civil War*. From the Colonial Period through the American Renaissance, with emphasis on the Puritans, the Transcendentalists, Poe, Hawthorne, and Melville. 4 q.h.

942. *American Literature from the Civil War to World War I*. Whitman and Dickinson; Realism and Naturalism, with emphasis on Twain, James, and Crane. 4 q.h.

1039. *Seminar in American Literature to World War I*. (May be repeated once.) 4 q.h.

### Area V

940. *Modern British Prose*. Representative fiction and nonfiction from 1890 — 1940; emphasis on relationships to social, cultural, political and artistic milieu. 4 q.h.

946. *Modern British and American Poetry*. Development and trends since 1900. Includes Yeats, Pound, Eliot, Williams, Stevens, and Frost. 4 q.h.

947. *Modern British and American Drama*. Representative works. Includes Shaw, O'Neill, and Beckett. 4 q.h.

948. *Contemporary Prose*. Representative fiction and non-fiction since World War II, excluding American. Development and trends. 4 q.h.

949. *American Prose Since World War I*. Representative fiction and non-fiction. Includes Fitzgerald, Hemingway, Faulkner, and Flannery O'Connor. 4 q.h.

1049. *Seminar in 20th Century British and American Literature*. (May be repeated once.) 4 q.h.

### English Education

906. *Teaching of Literature*. (Admin. & Sec. Ed. 906) Approaches to literature, including student responses, useful to the classroom teacher. Goals and strategies for teaching, and analyses of sample practices. 4 q.h.

907. *Teaching of Writing*. (Admin. & Sec. Ed. 907) Problems, issues, practices and research which affect the teaching of writing at various grade levels and in beginning college courses. 4 q.h.

918. *Children's Literature*. Classic and contemporary literature enjoyed by children. Development and trends; emphasis on critical standards and use of books in the classroom. 4 q.h.

919. *Adolescent Literature*. Classic and contemporary literature of interest to the adolescent. Development and trends; emphasis on critical standards and use of books in the classroom. 4 q.h.

975. *Special Topics in English Education*. Practical approaches to teaching English and the Language Arts. (May be repeated to a total of 4 q.h.) 1-4 q.h.

1052. *Seminar in English Education.* (May be repeated once.) 4 q.h.

**Linguistics Studies**

955. *The Bases of English Linguistics.* A thorough examination of the principles, concepts, terminology, and research methods necessary for study in specific areas of English linguistics — for those with no linguistics background. 4 q.h.

983. *English in Historical Perspective.* A comparison of current English pronunciation, vocabulary, meanings, spelling, and sentence forms with those in earlier periods of the language. Prereq.: Engl. 755 or 955 or equivalent. 4 q.h.

984. *Grammars of Modern English.* A comparative study of attempts to analyze English sentence structure. 4 q.h.

**Others**

965. *Film: Theory and Analysis.* Emphasis on classic and contemporary theories and their application to film criticism. 4 q.h.

990. *Special Topics.* (May be repeated once.) 4 q.h.

992. *Professional Communication.* Focus on technical writing, professional communication, proposal writing, or a related topic. (May be repeated once with a difference topic.) 4 q.h.

**FOREIGN LANGUAGES AND LITERATURES**

L. Allen Viehmeyer, *Chair of the Department*  
 501 DeBartolo Hall  
 (216) 742-3461

900. *Seminar.* Study of selected topics common to several, or all of the following languages: French, German, Italian, Spanish, Russian and Latin. The topic will be announced each time the course is offered. May be taken three times for credit if content is not repeated. Prereq.: Open only to graduate students proficient in at least one of the languages offered in the department. 4 q.h.

**French**

- 820. Selected Topics in 18th Century French Literature (4 q.h.)
- 830. Selected Topics in 19th Century French Literature (4 q.h.)
- 845. Selected Topics in 20th Century French Literature (4 q.h.)
- 850. Selected Topics in French Literature Outside of France (4 q.h.)
- 873. Textual Analysis (4 q.h.)
- 874. Advanced French Composition (4 q.h.)
- 885. Special Topics (2-4 q.h.)

901. *Special Topics in French.* Arranged course for graduate students only. May be repeated once if topic is different. Prereq.: Two 800-level courses in French with grade of B or better and permit to enter. 4 q.h.

**German**

- 860. Selected Masterpieces of German Literature (4 q.h.)
- 861. Contemporary German Literature (4 q.h.)
- 874. Advanced German Composition (4 q.h.)
- 885. Special Topics (2-4 q.h.)

901. *Special Topics in German.* Arranged Course for graduate students only. May be repeated once if topic is different. Prereq.: Two 800-level courses in German with grade of B or better and permit to enter. 4 q.h.

**Italian**

- 801. Italian Literature of the 14th Century (4 q.h.)
- 802. Italian Literature of the 16th Century (4 q.h.)
- 830. Italian Literature of the 19th Century (4 q.h.)
- 840. Italian Literature of the 20th Century (4 q.h.)
- 885. Special Topics (2-4 q.h.)

901. *Special Topics in Italian*. Arranged course for graduate students only. May be repeated once if topic is different. Prereq.: Two 800-level courses in Italian with grade of B or better and permit to enter. 4 q.h.

**Spanish**

- 805. Topics in Spanish Literature of the Golden Age (4 q.h.)
- 816. Topics in 19th Century Spanish Literature (4 q.h.)
- 825. Topics in 20th Century Spanish Literature (4 q.h.)
- 830. Selected Topics in Hispanic Literature in the United States (4 q.h.)
- 838. Topics in Modern Spanish-American Literature (4 q.h.)
- 855. Topics in Spanish Language and Linguistics (4 q.h.)
- 885. Special Topics (2-4 q.h.)

901. *Special Topics in Spanish*. Arranged course for graduate students only. May be repeated once if topic is different. Prereq.: Two 800-level courses in Spanish with grade of B or better and permit to enter. 4 q.h.

**FOUNDATIONS OF EDUCATION**

Peter A. Baldino, Jr., *Chair of the Department*  
1021 Fedor Hall  
(216) 742-3223

- 870. Problems of the Classroom Teacher (3 q.h.)
- 871. Pupil Problems (3 q.h.)
- 872. Statistical Methods in Education (3 q.h.)
- 873. Comparative Education (3 q.h.)
- 875, 876, 877. Seminar in Foundations of Education (1-4 q.h. each)
- 880. Inner-City Educational Workshop (3 q.h.)
- 889. Small Computer Applications in the Classroom (3 q.h.)

900R. *Seminar in History of the Education of Children and Youth*. A seminar on the history of childrearing which stresses the interplay of family and schooling on the idea of childhood. Students will do seminar papers. 3 q.h.

901. *Philosophical Foundations of Educational Theory and Practice*. An examination of the basic philosophical premises upon which functional educational systems have been based. 3 q.h.

902. *Socio-Cultural Aspects of Education*. An introduction to socio-cultural interpretations of teaching and learning with emphasis on recent developments in the theory and content of social science research in education. 3 q.h.

903. *Classics in Education*. Selected readings from classical works of literature and respected social commentaries which contribute to understanding educational values and the institutionalization of education. 3 q.h.

904. *Educational Research*. An introduction to the techniques of educational research and elementary statistical concepts. Preparation of a written prospectus for a research problem will be required. Stress will be placed on the use of the library in the collection of data. Experience



in interpreting research data will be provided in order to enable the student to adequately interpret the findings of educational research. Prereq.: Ed. 872, an equivalent course, or permission of instructor. 3 q.h.

905. *A History of American Education*. The development of educational practice in the United States. An examination of progress towards educational goals. Implications of historical backgrounds for present problems. 3 q.h.

915. *Critiques on Contemporary Education*. Selected writings of contemporary systematic social/educational critics. Emphasis on theories of schooling and public support of educational values. 3 q.h.

926. *Standardized Testing*. Study of the use and consequences of large-scale testing programs in education. Development of a knowledge base to enable students to critically examine current practices in educational testing. Emphasis will be on the interpretation and validity of test scores currently being used for instructional, administrative and political decision-making in education. 3 q.h.

928. *Research Methods in Health Services*. The study and application of research design in the area of health services. Each student will be required to conduct a literature search and to develop a research proposal. Prereq.: Psych. 910 or equivalent. 3 q.h.

932. *Theory and Practice in Evaluation Research*. Analyses of the major models including the Stufflebeam, Stake, Provus, and Scriven models used in educational program evaluation. 3 q.h.

933. *Proposal Writing in Education*. Techniques of drafting proposals for grants; particular emphasis on guidelines and regulations for 1) teacher mini-grants for State of Ohio, 2) Right to Read grants, and 3) Title IV-C grants and other educational funding sources as appropriate. Prereq.: Ed. 872 and 904 or equivalents. 4 q.h.

935. *Philosophical Foundations of Middle Grade Education*. (Elem. Educ. 935) Philosophical interpretations of teaching/learning and educational policy with emphasis on middle grade education. 3 q.h.

937. *Sociological Foundations of Middle Grade Education*. (Elem. Educ. 937) Socio-cultural interpretations of teaching/learning with emphasis on middle grade education. Prereq.: Ed. 935. 3 q.h.

953. *Philosophy of and Knowledge in Educational Research*. Examination of basic philosophical questions as they relate to specific developments in educational research and curriculum development theory. 3 q.h.

980. *Advanced Statistical Methods in Education*. An extension of parametric and nonparametric statistical techniques covered in Education 872 with emphasis on interpretation of educational data sets from SPSS computer printouts. Prereq.: Ed. 872 or equivalent. 3 q.h.

995. *Workshop in Foundations of Education*. Intensive study of selected issues or problems of current interest. 1-4 q.h., may be repeated to a maximum of 12 q.h.

998. *Field Experience in Educational Research*. Planned field experience in the area of Educational Research and Evaluation. Supervised participation in some aspect of action research in the schools. Prereq.: Ed. 872, 904, or Ed. 964, and permission of advisor. 3-6 q.h.

1000, 1001, 1002, 1003, 1004. *Seminar in Foundations of Education*. Study of selected issues and problems of current interest chosen on the basis of need; e.g., community-environmental influences on the school, international education, demographic studies regarding schools, and other selected topics. Prereq.: Graduate status and permission of instructor.

1-5 q.h., maximum total 15 q.h.

## GEOLOGY

Ikram Khawaja, *Chair of the Department*  
213 Engineering Science Building  
(216) 742-3612

- 802. Stratigraphy and Sedimentation (4 q.h.)
- 803. Optical Mineralogy (6 q.h.)
- 805. Special Problems in Geology (1-5 q.h.)
- 806. Introduction to X-Ray Diffraction (3 q.h.)
- 811. Environmental Geology (4 q.h.)
- 812. Sedimentology (2 q.h.)

901. *Geology of Ohio and Pennsylvania*. The geologic history and development of the rocks, structure, landforms and mineral resources of Ohio and Pennsylvania. Prereq.: Geol. 802 or equivalent. 4 q.h.

## HEALTH AND PHYSICAL EDUCATION

Barbara L. Wright, *Chair of the Department*  
307 Beeghly Physical Education Center  
(216) 742-3654

### Health

- 893. Workshop in Health Education. (1-4 q.h.)
- 948. *Analysis of Health Care Systems*. A study of the historical, political, philosophical, legal, and organizational elements of the American health care delivery systems. Prereq.: AH 707 or equivalent. 3 q.h.
- 949. *Principles of Community Health Practices*. An examination of various physiological, psychological and sociological factors which influence community health. Prereq.: Hlth. 791 or equivalent. 3 q.h.
- 950. *Philosophy of Health Education*. An examination of the principles, values, and purposes of health education. Prereq.: Ed. 901. 4 q.h.
- 951. *Advances in the Health Sciences*. Designed to provide students with an understanding of recent advances in the health sciences. Emphasis upon analysis of current research related to health promotion programs. Prereq.: Hlth. 790 or equivalent. 4 q.h.
- 953. *Health Behavior*. A review of research studies and models which identify the factors influencing individual health behavior. Prereq.: Hlth. 949. 3 q.h.
- 954. *Pedagogy in Health Education*. Analysis of effective health teaching based on current research. Emphasis on planning, methodology, teaching behaviors and evaluation. Prereq.: Hlth. 951 or Psych. 903. 4 q.h.
- 955. *Health Education Curriculum*. A study of curriculum development with emphasis on objectives, procedures, implementation, and evaluation. Prereq.: Hlth. 721 and 794 or equivalent. 4 q.h.
- 956. *Organization and Administration of Health Programs*. Principles of planning, implementing, evaluating, and administering programs in various health settings. Prereq.: Hlth. 948, 949, and 953. 3 q.h.

958. *Issues in Health and Health Services*. An examination of current philosophical, legal, and ethical issues related to health and the delivery of health services. Prereq.: Hlth. 948 and 949. 3 q.h.

1010. *Seminar*. A synthesis of the role of education and management in health services. Emphasis on specific problems, concerns, or issues related to various work settings. Prereq.: Hlth. 956 and 958, and any research class. 2 q.h.

1015. *Research Practicum*. An individual investigation of a topic including analysis, design, and research under the direction of a graduate health faculty member with the approval of the health coordinator. Prereq.: Hlth. 1010. 4 q.h.

## Physical Education

894. *Workshop in Physical Education/Athletics*. (1-4 q.h.)

900. *Pedagogy in Physical Education*. Description and analysis of teacher behaviors in physical education with emphasis on teaching methodology, the improvement of teaching skills, and planning for maximum student participation. 3 q.h.

901. *Sport in Society*. Sport studied as a social system interdependent with culture and society and as a social institution which is related to, or a part of, other basic institutions such as the family, education, religion, the economy, politics, and the mass media. Prereq.: PE 850 or 855. 4 q.h.

903. *Physical Education Curriculum*. Analysis and progressive development of the physical education curriculum for kindergarten through grade 12. Includes content and program planning. Prereq.: PE 766, 767, and 768 or equivalent. 3 q.h.

905. *Current Literature in Physical Education*. A critical analysis of recent literature and research in physical education. Readings are organized around problems significant to present-day physical education. Prereq.: Ed. 904 or equivalent. 3 q.h.

910. *Teaching of Motor Skills*. Analysis of research on motor learning and its application to the acquisition, the teaching and the coaching of movement skills. Prereq.: PE 795 or equivalent. 4 q.h.

920. *Mechanical Analysis of Motor Movements*. Scientific basis for teaching correct form for the exact execution of movement skills through the fundamental laws of physics pertaining to motion. Analysis of various motor activities in order to determine the proper mechanics for obtaining the most effective and efficient results. Prereq.: PE 795 or equivalent. 4 q.h.

930. *Laboratory Instrumentation*. A laboratory course designed to provide instruction and practical experience in operating laboratory equipment for the measurement of physiological parameters in the human. Two hours lecture and two hours laboratory per week. Prereq.: PE 896 or equivalent. 3 q.h.

935. *Biodynamics and Human Performance*. The physiology of human exercise responses to various stress conditions such as environmental, psychosocial, disease and maximal performance. Prereq.: PE 896 or equivalent. 3 q.h.

940. *Administration of Exercise Programs*. Designed to provide guidelines for graded exercise stress testings and exercise prescription programs. Included are behavioral objectives for physicians, program directors, exercise leaders, and exercise technicians. Course guidelines for exercise programs are those established by the American College of Sports Medicine. Prereq.: PE 896 or equivalent. 2 q.h.

990. *Independent Study*. Individual study and projects under faculty supervision. Prereq.: Permission of instructor and department chair. (May be repeated to a maximum of 4 q.h.) 1-4 q.h.

## HISTORY

George D. Beelen, *Chair of the Department*  
520 DeBartolo Hall  
(216) 742-3452

901. *Historical Literature: American.* Readings in the standard works and monographic studies to meet the requirements of qualified graduate students who wish intensive concentration in specific areas of American History. (May be repeated with permission of instructor.) 4 q.h.
902. *Seminar in American Colonial History.* Selected problems of early American History. (May be repeated with permission of instructor.) 4 q.h.
903. *Seminar in 19th Century America I.* Selected problems of American history, 1800-1865. (May be repeated with permission of instructor.) 4 q.h.
904. *Seminar in 19th Century America II.* Selected problems of American history, 1865-1900. (May be repeated with permission of instructor.) 4 q.h.
905. *Seminar in 20th Century America.* Selected problems of American history in the 20th Century. (May be repeated with permission of instructor.) 4 q.h.
906. *Historical Literature: European.* Readings in the standard works and monographic studies to meet the requirements of qualified graduate students who wish intensive concentration in European history. (May be repeated with permission of instructor.) 4 q.h.
912. *Seminar in Greek and Roman History.* The sources and problems of Greek and Roman history. (May be repeated with permission of instructor.) 4 q.h.
913. *Seminar in Medieval Culture and Society.* The main intellectual and social currents of the Middle Ages. (May be repeated with permission of instructor.) 4 q.h.
914. *Seminar in Renaissance and Reformation.* Trends and aspects of the Renaissance and Reformation. (May be repeated with permission of instructor.) 4 q.h.
915. *Seminar in 17th Century Europe.* Dutch Commercial Enterprise; the France of Louis XIV; Austria and the Empire; emergence of Brandenburg-Prussia; rise of Modern Science; the Age of Reason; the Development of the Baroque in Arts and Literature. 4 q.h.
916. *Seminar in 18th Century Europe.* Selected areas of the Enlightenment, Old Regime, and the French Revolution. (May be repeated with permission of instructor.) 4 q.h.
917. *Seminar in 19th Century Europe.* The Napoleonic and post-Napoleonic era and the rise of nationalism in Europe. (May be repeated with permission of instructor.) 4 q.h.
918. *Seminar in 20th Century Europe.* Investigation of the causes of the great world wars, the rise of totalitarianism and the cold war. (May be repeated with permission of instructor.) 4 q.h.
919. *Seminar in Russian History.* Selected problems of Russian history. (May be repeated with permission of instructor.) 4 q.h.
920. *Historical Literature: Asian.* Readings in the standard works and monographic studies to meet the requirements of qualified graduate students who wish intensive concentration in Asian history. (May be repeated with permission of instructor.) 4 q.h.
921. *Seminar in Asian History.* Selected problems in the political, social, economic, diplomatic, and intellectual history of traditional or modern East Asia. (May be repeated with permission of instructor.) 4 q.h.

922. *Seminar in British Empire*. An examination of major problems confronting the British Empire after 1783. (May be repeated with permission of instructor.) 4 q.h.
923. *Seminar in Middle Eastern History*. This course will deal with topics drawn from the Ancient Near East down to the contemporary clash of nationalisms in the Middle East. (May be repeated with permission of instructor.) 4 q.h.
925. *Seminar in English History*. An examination of selected problems in the political, social, economic, and intellectual history of England. (May be repeated with permission of instructor.) 4 q.h.
931. *Research*. 1-9 q.h.
932. *Studies in the Teaching of History*. Investigation and discussion of the research and some of the underlying assumptions in the teaching of history, with implications for the teacher of social studies in the secondary schools and for the prospective history professor. Required of all graduate assistants in history. 4 q.h.
935. *Special Topics in History*. Studies in selected topics in history. (May be repeated. Degree students may receive credit for this course only once.) 3 q.h.
940. *Historical Literature: Latin American*. Readings in the standard works and monographic studies to meet the requirements of qualified graduate students who wish intensive concentration in Latin American history. (May be repeated with permission of instructor.) 4 q.h.
941. *Seminar in Latin American History*. Selected problems in the political, social, economic, diplomatic, religious, and cultural history of traditional or modern Latin America. (May be repeated with permission of instructor.) 4 q.h.
948. *Introduction to Historical Research*. Instruction in the basic tools and techniques of historical research and study. Required of all candidates for advanced degrees in history. 4 q.h.
949. *Historiography: American*. An introduction to the professional study of American history, including an examination of the sources and nature of historical knowledge, historical criticism, and synthesis. Required of all candidates for advanced degrees with concentration in the field of American history. 4 q.h.
950. *Historiography: European*. An introduction to the professional study of European history including an examination of the sources and nature of historical knowledge, historical criticism, and synthesis. Required of all candidates for advanced degrees with concentration in the field of European history. 4 q.h.
960. *Historical Literature: African*. Readings in the standard works and monographic studies to meet the requirements of qualified graduate students who wish intensive concentration in African history. (May be repeated with permission of instructor.) 4 q.h.
961. *Seminar in African History*. Selected problems in the political, social, economic and intellectual history of Africa. (May be repeated with permission of instructor.) 4 q.h.
970. *Oral History*. Instruction in the methods of taking, processing and utilizing oral depositions relating to history. The course will include assignments in the field. (May be repeated once.) 4 q.h.
980. *Independent Study*. Individual study in concentrated areas of history under the supervision of a staff member. May be repeated to a maximum of 8 q.h. Prereq.: Permission of the instructor and the Graduate Director. 1-4 q.h.



## HOME ECONOMICS

Mary J. Beaubien, *Chair of the Department*  
3044 Cushwa Hall  
(216) 742-3344

- 825. Current Nutrition Concepts (4 q.h.)
- 830. Homemaker Rehabilitation (4 q.h.)
- 833. School-Age Child Care (3 q.h.)
- 862. Cultural Foods (3 q.h.)
- 862L. Cultural Foods Laboratory (1 q.h.)
- 870. Home Economics Workshop (2-4 q.h.)
- 872. Maternal and Child Nutrition (4 q.h.)
- 873. Nutrition and Aging (4 q.h.)
- 888. Historic Costume and Furnishings (4 q.h.)
- 890. Job Training Methods (4 q.h.)
- 892. Community Programming in Home Economics (4 q.h.)
- 895. International Studies in Home Economics (2-6 q.h.)

902. *Nutrition Education*. Examination of common nutrition assumptions and claims, techniques in teaching nutrition, development of teaching materials and plans, emphasizing integration into existing courses. Prereq.: Four quarter hours in teaching methods or equivalent. 3 q.h.

904. *Family Life Education*. Focus on current issues and challenges impacting on families, investigation of literature and application of theory; development of techniques and materials for teaching family relationships and child development at various grade levels. Prereq.: Eight quarter hours of child and/or family studies. 4 q.h.

908. *Problems in Apparel Design*. Advanced techniques in developing patterns and designing apparel. To meet students needs, emphasis will be placed on tailoring, flat pattern design and/or draping. Each student will construct a garment. Prereq.: HE 703 or equivalent. 4 q.h.

910. *Special Topics in Home Economics*. Issues and problems of current interest chosen on the basis of need. Prereq.: HE 731 or equivalent. 2-4 q.h.

950. *Readings in Home Economics*. Individual investigation of a special topic; annotated bibliography required. Prereq.: Departmental approval. (May be repeated for up to 4 q.h.) 1-2 q.h.

## INDUSTRIAL ENGINEERING

Wade C. Driscoll, *Chair of the Department*  
238 Engineering Science Building  
(216) 742-3024

- 801. Linear Programming (4 q.h.)
- 825. Advanced Engineering Economy (4 q.h.)
- 850. Introduction to Operations Research (4 q.h.)

901. *Optimization Techniques*. A study of the theory of optimization and its application to problems from several engineering disciplines. The principles of optimization will be applied to constrained and unconstrained engineering problems. Algorithms will be developed for solving optimization problems which can be formulated as linear, nonlinear, integer or dynamic programming models. Prereq.: Math 674. 4 q.h.

902. *Digital Simulation*. An introduction to methods of simulation using the digital computer. The generation of random numbers. Monte Carlo techniques, queueing models, and error analysis will be presented. The student will be provided the opportunity to simulate moderately complex physical systems on the digital computer. Primary emphasis will be on models of industrial operations. Prereq.: Math 674, IE 642. 4 q.h.

903. *Engineering Statistics*. Development and application of stochastic models of engineering systems. Elementary probability models applied to decision making under uncertainty. Development and use of theoretical probability distributions for describing stochastic systems. Models for point and confidence interval estimation and models for correlation analysis applied to engineering problems. Prereq.: Math 674. 4 q.h.

## MANAGEMENT

Clement Psenicka, *Chair of the Department*  
646 Williamson Hall  
(216) 742-3071

851. Problems in Industrial Management (3 q.h.)  
860. Comparative Management (4 q.h.)

900. *The Foundation of Management*. A study of the fundamental concepts and functions of management. Each functional area is analyzed and the interrelationship of the functions emphasized. Topics such as organization design, authority-power relationships, control systems, group behavior, participative management, span of control, etc., will be covered. (Not applicable toward MBA.) 3 q.h.

915. *Research Methodology*. Nature, methods and techniques of research in management; to include the scientific method in business; sampling theory, variable analysis, and research problems applying these techniques. Prereq.: Econ. 900 or equivalent, Acct. 610 or equivalent, and Mgmt. 900 or equivalent. 4 q.h.

916. *Quantitative Analysis for Business Decisions*. The application of mathematical models to managerial decision-making with emphasis on problem formulation, on sensitivity analysis, and on other aspects of model interpretation. Prereq.: Econ. 900, Mgmt. 900, or permission of instructor. 4 q.h.

917. *Management Information Systems*. Present concepts required for the design, implementation, and utilization of management information systems. The primary emphasis of this course will be development of a total information system for executive level planning and decision-making. Will deal with modern systems concepts and tools; design and scheduling; computer application in integrated systems. Prereq.: Acct. 610 and Mgmt. 900 or equivalent. 4 q.h.

918. *Business System Simulation*. Simulation as a decision-making technique useful for studying complex business systems. Involves building and validating a model to represent the business system under study and simulating the behavior of the model. The application of simulation to a variety of business problems is covered. Prereq.: Acct. 610 or equivalent, Mgmt. 900 or equivalent. 4 q.h.

921. *Operations Management I*. Product design and selection, process planning, plant location, plant layout, methods study and labor standards, forecasting, aggregate planning and master scheduling, inventory control, scheduling, quality control. Prereq.: Mgmt. 900 or equivalent, and Mgmt. 916. 4 q.h.

## 98 COURSES

951. *Theory of Organization*. A macro level approach to study of the organizing function. Open and closed system strategies are utilized in studying organizations. Explores the impact of strategy, technology, contingencies, and conflict on organization structure and form. Prereq.: Mgmt. 900 or equivalent. 4 q.h.
952. *Management Theory and Thought*. Modern management thought and theory by an analysis and study of the 19th and 20th century literature. Prereq.: Mgmt. 900 or equivalent. 3 q.h.
954. *International Management*. Planning, organizing and control within the context of a multinational corporation, with emphasis upon problems of adaptation to different sociological, cultural, legal, political, and economic environmental characteristics. Prereq.: MBA core. 4 q.h.
961. *Organizational Behavior*. The study of the behavior of individuals and groups in organizations. Major theoretical positions and research findings are examined with emphasis on the implications for organizational design and management practice. Prereq.: Econ. 900 or equivalent and Mgmt. 915. 4 q.h.
962. *Organizational Staffing Process*. Brief survey of the field of human resource management, followed by intensive analysis of programs for manpower acquisition, maintenance and development. Emphasis on determination of organizational needs, and the development and effective utilization of available human skills and competencies. Examination of applicable federal and other employment legislation. Prereq.: Mgmt. 900 or equivalent. 4 q.h.
963. *Industrial Relations*. Analysis of managerial and organizational aspects of employee relations arising out of relations with union negotiation, and application of contracts, living with contracts, and pertinent legislative matters. Prereq.: Mgmt. 900 or equivalent. 4 q.h.
964. *Compensation Management*. Development and maintenance of compensation and benefits programs. Wage and salary determination, job evaluation and pricing, incentives, managerial and executive compensation. 4 q.h.
965. *Business Policy*. The correlation of theory and practice in the development of business policy. Emphasis on the problems of executive management, decision making, and administrative action. Prereq.: Completion of all MBA degree core courses. 4 q.h.
966. *Operations Management II*. Advanced topics in production planning and control. The major emphasis is on case studies and individual projects. Prereq.: Mgmt. 921 or equivalent. 4 q.h.
968. *Special Topics in Management*. Topics may vary from quarter to quarter and will be announced along with prerequisites and hours. (May be repeated.) 1-3 q.h.
969. *Seminar in Management*. Analysis of long range planning, organizational development, systems management, executive decision-making, organizational behavior, control systems, and others. Prereq.: Mgmt. 961. 3 q.h.
971. *Business and Society*. Complex and dynamic interrelationships between business and society: social, cultural, legal, ethical, economic and technological issues, philosophies and points of view which influence business. Prereq.: Mgmt. 900 or equivalent. 4 q.h.
996. *Research Problems*. Special projects undertaken by MBA students under the direction of faculty members of professorial rank. The exact number to be used will be determined by the nature of the project. Credit will be determined in each case in the light of the nature and extent of the project. 1-6 q.h.
998. *Thesis*. 6 q.h.

## MARKETING

E. Terry Deiderick, *Chair of the Department*  
 534 Williamson Hall  
 (216) 742-3080

900. *Foundations of Marketing.* A basic examination of marketing as a business process by which products are matched with markets and through which transfers of ownership are effected. This course satisfies the appropriate prerequisite requirement for the MBA degree. (Not applicable toward the MBA.) 3 q.h.

915. *Research Techniques.* Nature, methods and techniques of research and the use of research by management; the scientific method in business, sampling theory, variable analysis and research cases. 3 q.h.

941. *Marketing Theory.* A critical appraisal of emerging marketing concepts, their development, acceptance and expected future direction; focus on the role of marketing in the overall economy rather than within the firm. Prereq.: Mktg. 900 or equivalent. 3 q.h.

942. *Marketing Administration.* A managerial approach, emphasizing the integration of marketing as an organic activity, with other activities of the business firm. By case analysis and consideration of current marketing literature, students are provided the opportunity to develop marketing management abilities. Prereq.: Mktg. 900 or equivalent. 4 q.h.

943. *Physical Distribution Management.* Problems encountered in the movement of goods from the end of the production line to the ultimate consumer; consideration of total distribution and its application in the design and reconstruction of distribution systems. The relationships between materials handling, warehousing, inventory carrying, and transportation costs are explored together with methods of analysis designed to disclose optimum combinations. Prereq.: Mktg. 900 or equivalent. 4 q.h.

944. *Product Management.* The search for new product ideas and their evaluation; the organizational structure necessary to the development and introduction of new products and the management of a product line; the commercial aspects of product design, packaging, labeling, and branding; considerations involved in making product deletion decisions. Prereq.: Mktg. 900 or equivalent. 3 q.h.

945. *Marketing Communications.* Consideration of behavioral science approaches to mass and interpersonal communication and audience behavior. Psychological and sociological data are introduced in relationship to the promotional strategy of marketing communication with emphasis on the dynamics of advertising and selling. Prereq.: Mktg. 900 or equivalent. 3 q.h.

946. *Consumer Behavior.* The analysis of behavior of consumers both in groups and as individuals in order to assist the marketing manager in such areas as selection of target segments, advertising and media selection, personal selling, product development, marketing research, pricing and distribution policies. In addition to business writings, relevant material from psychology, sociology, economics and anthropology will be utilized to familiarize the student with the behavior of the consumer in the market place. Prereq.: Mktg. 900 or equivalent. 4 q.h.

947. *Marketing and Social Responsibility.* Current marketing problems created by emerging social, environmental, and consumer pressures and the need to balance consumer satisfaction, profits, and social responsibility. Topics include Selling Practices, Product Safety, Consumerism, Environmental Issues, Disadvantaged Market Segments, Product Quality, Consumer Advocates, and Social Critics. Prereq.: Mktg. 900 or equivalent. 3 q.h.

## 100 COURSES

948. *Market Planning and Demand Analysis*. An in-depth study of forecasting and demand analysis techniques and their role in marketing planning and strategy formulations. Application of regression and correlation analysis, historical trend projection, model-based forecasting and market survey methods. Extensive use will be made of computer-based forecasting models. Prereq.: Mgmt. 915, Mktg. 900 or equivalent, or permission of instructor. 4 q.h.

949. *International Marketing Management*. The functions, problems and decision-making processes of marketing executives in business organizations involved in foreign markets are studied. Students are given the opportunity to develop foreign market evaluations applying classroom knowledge to practical decision problems. Involvement of the student on an individual basis is stressed. Prereq.: Mktg. 942 or equivalent. 4 q.h.

950. *Marketing Research and Analysis*. The use of focus groups, store and diary panels, lister-ship, recall and test market studies, and other marketing research methods for collecting consumer and market data. Data are analyzed and evaluated utilizing univariate and multivariate techniques to assist marketing decision-making. Prereq.: Mgmt. 915, Mktg. 942. 4 q.h.

968. *Special Topics in Marketing*. Topics may vary from quarter to quarter and will be announced along with prerequisites and hours. Course may be repeated. 1-3 q.h.

996. *Research Problems*. Special projects undertaken by MBA students under the direction of faculty members of professorial rank. The exact number to be used will be determined by the nature of the project. Credit will be determined in each case in the light of the nature and extent of the project. 1-6 q.h.

998. *Thesis*. 6 q.h.

## Public Relations

950. *Theory and Practice of Public Relations*. A study, analysis, and evaluation of policies and programs designed to identify an organization with the public interest, and to gain public understanding and support. 3 q.h.

## Advertising

955. *Theory and Practice of Advertising*. A study, analysis, and evaluation of advertising objectives relating to media selection, creative function, campaigns, and research for decision-making and control. Prereq.: Mktg. 941 or 942 or by permission of instructor. 3 q.h.

## MATERIALS SCIENCE

Richard W. Jones, *Director of the Program*  
216 Engineering Science Building  
(216) 742-1735

### Materials Engineering

- 820, 821. Principles of Extractive Metallurgy I, II (4+4 q.h.)
- 855. Composite Materials (4 q.h.)
- 861, 862. Applied X-Rays I, II (3+3 q.h.)
- 864. Thermodynamics of Materials II (4 q.h.)
- 865. Advanced Science of Materials (4 q.h.)
- 866. Special Topics (3 q.h.)
- 867. Fractography and Failure Analysis (4 q.h.)



868. Scanning Electron Microscopy of Engineering Materials (3 q.h.)

871. Physical Metallurgy IV (4 q.h.)

872. Refractory Metals and Alloys (4 q.h.)

887. Metallurgical Design (4 q.h.)

901. *Fundamentals of Materials Science*. Fundamental nature of solid materials. Atomic characteristics, electronic properties, crystal and molecular structures of metallic, ceramic and polymer materials. (Not intended for majors with an undergraduate degree in Materials Engineering.) 4 q.h.

901L. *Experimental Methods in Materials Engineering*. Modern laboratory techniques used to examine and analyze materials. Included are: metallographic methods, x-ray diffraction, and electron microscopy. 1 q.h.

903. *Structural Properties/Characteristics of Materials*. Relationships between fundamental characteristics of materials and their engineering properties. Both structure sensitive and structure insensitive properties will be discussed. 4 q.h.

904. *Mechanical Properties/Characteristics of Materials*. Advanced mechanical properties of materials. Relationships between fundamental and practical properties will be discussed. 4 q.h.

915. *Failure Analysis*. Advanced methods in failure analysis of metallics, ceramics, polymers, and composites. Numerous practical examples will be discussed. Prereq.: Mat. Engr. 904. 4 q.h.

924. *Polymers — Theory, Design, and Applications*. Emphasis will be on relationships between molecular structure and processing, and the mechanical behavior of polymers. 4 q.h.

925. *Composites — Theory, Design, and Applications*. Theoretical considerations of composite properties; design and use of composites. 4 q.h.

930. *Electronic and Magnetic Materials*. Atomic and electronic properties of semiconductors, ferri-electrics, piezoelectric, lasers, and magnetic materials will be discussed. Processing techniques also included. 4 q.h.

970. *Manufacturing Process Methods I*. Advanced manufacturing processing for metallic materials. Included are continuous casting, powder techniques, fluidized bed reactors, and directional solidification. 4 q.h.

971. *Manufacturing Process Methods II*. Advanced manufacturing processing for non-metallic materials. Included are sintering, slip-casting, plastic forming techniques, and extrusion of non-plastic materials. 4 q.h.

973. *Nuclear Materials, Properties, and Radiation Effects*. Nature of materials used in the nuclear industry. Effects of neutron radiation on properties of these materials emphasized. 4 q.h.

975. *Special Topics in Materials Science*. Advanced topics in materials science. May not be repeated for credit toward the degree. 4 q.h.

976. *Modern Research Techniques in Materials Science*. Advanced methods used in experimental materials science. Included are x-ray and electron microscopy and quantitative metallography techniques. (Required for non-thesis students.) 4 q.h.

980. *Materials Design — Industrial Problems*. Design problems in materials engineering. Open-ended solutions to industrial problems required. 4 q.h.

990, 991. *Thesis I and II*. 2-4+ 2-4 q.h.

## MATHEMATICAL AND COMPUTER SCIENCES

Albert J. Klein, *Chair of the Department*  
1055 Cushman Hall  
(216) 742-3302

### Mathematics

- 827. Abstract Algebra III (4 q.h.)
- 838. Graph Theory and Algorithms (4 q.h.)
- 841. Mathematical Statistics II (4 q.h.)
- 842. Statistical Decision Theory (4 q.h.)
- 843. Theory of Probability (4 q.h.)
- 845. Operations Research (4 q.h.)
- 860. Mathematical Logic (4 q.h.)
- 861. Numerical Analysis II (4 q.h.)
- 872. Intermediate Real Analysis III (4 q.h.)
- 875. Introduction to Complex Variables (4 q.h.)
- 880. Introduction to Topology (4 q.h.)
- 890. Mathematics Seminar (2 q.h.)
- 895. Selected Topics in Mathematics (May be repeated once.) (2-5 q.h.)

901. *Topics in Analysis*. A course in analysis aimed at developing a broad understanding of the subject. Prereq.: Departmental permission. 5 q.h.

902. *Topics in Modern Algebra*. A course in modern algebra aimed at developing a broad understanding of the subject. Prereq.: Departmental permission. 5 q.h.

903. *Topics in Geometry*. A course in Euclidean and projective geometry with emphasis on projective spaces of dimensions one and two, especially designed to develop a broad understanding of the subject. Prereq.: Departmental permission. 4 q.h.

910, 911. *Advanced Engineering Mathematics I, II*. A presentation of methods in applied mathematics. Selected topics may include: differential equations, infinite series, linear spaces and operators, matrices and determinants, functions of a complex variable, special functions of mathematical physics, operational calculus, and partial differential equations. Emphasis is placed on applications to engineering. Prereq.: Math 705 or permission of instructor. 4+4 q.h.

920, 921. *Modern Algebra I, II*. A study of algebraic theories, finite groups, field extensions and Galois theory, rings, modules, and multilinear algebra. Prereq.: Math 827. 4+4 q.h.

925, 926. *Advanced Numerical Analysis I, II*. Topics covered include eigenvalue-eigenvector analysis, boundary value problems, and approximation methods for partial differential equations. Prereq.: Math 725, 760, a knowledge of FORTRAN or Pascal programming, and either Math 861, 901 or permission of the instructor. 4+4 q.h.

928. *Number Theory*. A study of the theory of congruences, quadratic reciprocity, functions of number theory, Diophantine equations, Farey fractions, continued fractions and other topics. Prereq.: Math 722 or 902. 4 q.h.

930. *Differential Geometry*. The classical differential geometry of curves and surfaces, with tensors. Prereq.: Math 705, 872. 4 q.h.

933, 934, 935. *Geometry I, II, III*. Euclidean and non-Euclidean geometries. The course includes hyperbolic geometry, geometric transformations and axiomatizations. Prereq.: Math 725, 730 and 732 or 903. 4+4+4 q.h.

938. *Combinatorics*. Enumerative analysis, generating function, Mobius inversion and Polya counting; incidence structures. Prereq.: Math 838 and either 722 or 902. 4 q.h.
- 945, 946. *Stochastic Processes I, II*. A study of Markov chains, Poisson processes, Wiener processes, and renewal processes with applications to queueing and traffic, system reliability, epidemics, inventory, and time series. Prereq.: Math 725, 752, and either 815 or 843, or permission of instructor. 4+4 q.h.
- 948, 949. *Analysis of Variance I, II*. A study of linear statistical models of the relationship between analysis of variance and regression and of the assumptions underlying the analysis of variance. Prereq.: Math 725 and 841 or permission of the instructor. 4+4 q.h.
950. *Infinite Series*. An extensive treatment of convergent and divergent series including a strong emphasis on summability methods of divergent series. Prereq.: Math 752. 4 q.h.
952. *Advanced Differential Equations*. Theory of differential equations including a study of fundamental existence and uniqueness theorems for solutions. Further topics selected from: phase plane analysis, stability theory, boundary value problems, partial differential equations, integral equations, applications. Prereq.: Math 705, 725, and 752, or permission of instructor. 4 q.h.
960. *Mathematical Logic II*. A study of the elements of recursive function theory and topics such as Gödel's incompleteness theorem and decision problems for theories. Prereq.: Math 860 or permission of instructor. 4 q.h.
- 965, 966. *Introduction to Real Analysis I, II*. Calculus in n-dimensional Euclidean spaces. Riemann and Lebesgue integration and related topics. Prereq.: Math 872. 4+4 q.h.
- 971, 972. *Real and Abstract Analysis I, II*. Introduction to general measure theory and functional analysis. The Radon-Nikodym theorem, the Fubini theorem, the Hahn-Banach theorem, the closed graph and open mapping theorems, weak topology. Prereq.: Math 966. 4+4 q.h.
- 975, 976. *Complex Analysis I, II*. A course in classical complex analysis. The Cauchy theorem, the Weierstrass, Mittag-Leffler, Picard, and Riemann theorems, Riemann surfaces, harmonic functions. Prereq.: Math 752, 875. 4+4 q.h.
- 980, 981. *Topology I, II*. A further study of topological spaces. Separation, metrization, compactification. Additional topics will be selected from the following: point-set topology, algebraic topology, combinatorial topology, topological algebra. Prereq.: Math 880. 4+4 q.h.
990. *Independent Study*. Study under the supervision of a staff member. Prereq.: Permission of the department chair. (May be repeated.) 1-5 q.h.
995. *Special Topics*. Special interest topics selected by the staff. Prereq.: Permission of instructor and department chair. (May be repeated to a maximum of 12 q.h.) 1-5 q.h.
996. *Mathematical Projects*. Individual research projects culminating in a written report or paper, not as broad in scope as a thesis. (May be repeated once if the project is in a different area of mathematics.) 2 q.h.
999. *Thesis*. A student may register for 6 q.h. in one quarter or for 3 q.h. in each of two quarters. 3-6 q.h.

## Computer Science

800. File and Communication Systems (4 q.h.)
806. Operating Systems (4 q.h.)
807. Compiler Design (4 q.h.)
810. Computer Graphics (4 q.h.)
814. Computer Architecture (4 q.h.)
817. Communication Networks for Computers (4 q.h.)
820. Simulation (4 q.h.)

835. Artificial Intelligence (4 q.h.)
840. Theory of Finite Automata (4 q.h.)
855. Database Systems (4 q.h.)
860. Programming Language Structures (4 q.h.)
870. Data Structures and Algorithms (4 q.h.)
881. Microcomputer System Architecture (4 q.h.)
895. Special Topics (2-5 q.h.)
901. *Principles of Computer Programming.* Significant features of several computer programming languages to fit the needs of graduate students with no previous computer science experience. Programming techniques and problem analysis. Students will do programming projects appropriate for their needs. 4 q.h.
905. *Information Structures.* Basic concepts of information: modeling structures, machine level implementation, storage management, programming, language implementation, and run-time structures; sorting and searching. Prereq.: Comp. Sci. 620 and 710 or permission of instructor. 4 q.h.
910. *Computer Software Systems.* Classes of software systems, system structures, systems operations. Resource management routines. Software design. Prereq.: Comp. Sci. 905. 4 q.h.
915. *Computer Organization and Architecture.* Organization and architectural design of the subsystems and major functional units of modern digital computers and their interconnections. Prereq.: Comp. Sci. 905. 4 q.h.
930. *Formal Languages and Syntactic Analysis.* Study of formal languages, especially context-free languages, and their applications to parsing and syntactic analysis. Prereq.: Comp. Sci. 905, or 705 and 710. 4 q.h.
950. *Analysis of Data Base Systems.* Study of the organization, design, implementation and modification of large-scale information processing systems. Prereq.: Comp. Sci. 910, or 800 and 805. 4 q.h.
990. *Computer Science Project.* Report and discussion of individual topics or research projects in computer science. Prereq.: 12 quarter hours of computer science courses numbered above 800. (May be repeated once in a different area of computer science.) 2-4 q.h.
995. *Special Topics in Computer Science.* Special topics in computer science selected by the staff. Prereq.: Permission of instructor. (May be repeated in a different topic up to 12 q.h.) 1-5 q.h.
996. *Independent Study.* Study under the supervision of a faculty member. Prereq.: Permission of department chair. (May be repeated up to a maximum of 10 q.h.) 1-5 q.h.
999. *Thesis.* A student may register for 6 q.h. in one quarter or for 3 q.h. in each of two quarters. 3-6 q.h.

## MECHANICAL ENGINEERING

Frank A. D'Isa, *Chair of the Department*  
 201 Engineering Science Building  
 (216) 742-3016

825. Heat Transfer II (4 q.h.)
830. Fluid Mechanics (4 q.h.)
843. Kinetics of Machinery (4 q.h.)
852. Stress and Strain Analysis II (4 q.h.)
862. Human Factors in Mechanical Design (4 q.h.)

870. Mechanical Vibrations (4 q.h.)
872. Engineering Acoustics (4 q.h.)
892. Control Theory (Not for Electrical Engineering majors.) (4 q.h.)
900. *Special Topics*. Special topics and new developments in mechanical engineering. Subject matter and credit hours to be announced in advance of each offering. Prereq.: As announced, or permission of instructor. (May be taken three times.) 2-5 q.h.
904. *Advanced Thermodynamics*. Laws of equilibrium thermodynamics; relations between properties and aspects of the Second-Law. Macroscopic and microscopic considerations for the prediction of properties. Microscopic description based on classical and quantum statistics. General stability criteria, statistical equilibrium, and trend toward equilibrium fluctuations. 4 q.h.
922. *Advanced Heat Transfer*. Selected topics in steady-state and transient conduction heat transfer emphasizing techniques used in the solution of practical engineering problems. The solutions of Bessel and Legendre equations. Prereq.: ME 725 or equivalent course. 4 q.h.
923. *Advanced Convective Heat Transfer*. Heat transfer with fluids flowing in ducts, including entrance length effects; laminar and turbulent thermal boundary layers; natural convection; Reynold's analogy; special topics in heat transfer drawn from areas of boiling, condensation, or compressible flows. Prereq.: ME 725 or equivalent course. 4 q.h.
924. *Advanced Radiative Heat Transfer*. Fundamental concepts and basic laws of thermal radiation. Radiative properties of surfaces and materials. Exchange of radiant energy between surfaces. Radiative interchange among surfaces separated by radiatively non-participating media. Thermal radiation from gases. Energy transfer by radiation combined with conduction and/or convection. Prereq.: ME 725 or equivalent. 4 q.h.
925. *Computational Heat Transfer*. Numerical modeling techniques and methods in heat transfer. Computational analysis of conduction and convection by the finite element method, finite difference method, and the method of coordinate transformation. Prereq.: ME 725, Math 706, or equivalent. 4 q.h.
937. *Ideal Fluid Flow*. Equations of inviscid flow. Flow along a streamline. Integration of Euler's equation. Two and three dimensional inviscid flow past bodies of various shapes. Application of complex variable theory to two-dimensional inviscid flows. Prereq.: ME 830 or equivalent. 4 q.h.
938. *Viscous Fluid Flow*. Fundamentals of viscous flow. Solutions of Navier-Stokes equation; steady and unsteady flow. Creeping flow; Oseen's modification. High Reynolds number flow. Two- and three-dimensional boundary layer theory. Hydrodynamic instability. Prereq.: ME 830 or equivalent. 4 q.h.
945. *Advanced Dynamics*. Three-dimensional vector statics; kinematics and kinetics of particles and rigid bodies; energy, momentum, stability. LaGrange's equations of motion for particles and rigid bodies impulse; small oscillations; non-holonomic and dissipative systems. 4 q.h.
952. *Applied Elasticity*. Equations of equilibrium, compatibility and boundary conditions; their applications to plane stress and plane strain problems. Stress functions, strain energy methods, stress distribution in axially symmetrical bodies; special problems in structures involving torsion and bending of prismatical bars. Prereq.: ME 852 or equivalent course. 4 q.h.
955. *Applied Plasticity*. Equations for yield criteria and stress-strain relations; their application to elasto-plastic and fully plastic problems considering strain hardening. Introduction to limit analysis and creep. Prereq.: ME 952. 4 q.h.
962. *Mechanical Design Analysis*. The study of analytical aspects and the application of engineering science topics to machine elements and machinery. Some case studies in mechanical design. 4 q.h.



963. *Experimental Stress Analysis*. Theory and engineering applications of the most recent techniques of experimental stress analysis; brittle coatings, photoelasticity, strain gauges, photostress. Prereq.: ME 751 or equivalent course. 4 q.h.

982. *Advanced Engineering Analysis*. An integration of the fundamental laws and principles of basic science to obtain practical solutions of engineering problems. Formulation of mathematical models for complex physical situations and the organization of computational programs for their solutions. Examples of lumped and distributed parameter systems chosen from the areas of mechanics, thermodynamics, heat transfer, and electrical circuit theory. Prereq.: ME 781 or equivalent course. 4 q.h.

986. *Theory of Continuous Medium*. General discussion of Cartesian tensors. Application of tensor theory to elasticity, fluid flow, and dynamics. General analysis of continuous medium. 4 q.h.

990. *Thesis*. 2-9 q.h.

991. *Thesis*. 2-9 q.h.

992. *Graduate Projects*. Analysis, design, research, or other independent investigation on projects selected, with the advice and approval of the student's graduate committee. 4 q.h.

## MUSIC

Donald W. Byo, *Director of the School*  
3000 Bliss Hall  
(216) 742-3636

- 800 A, B, C. Performance Minor (2+2+2 q.h.)
- 801, 802, 803. Performance Minor (2+2+2 q.h.)
- 814. Selected Topics in Music Education (2 q.h.)
- 820, 821, 822. Composition (2+2+2 q.h.)
- 830. Materials of Twentieth Century Music (3 q.h.)
- 831. Counterpoint I (3 q.h.)
- 832. Counterpoint II (3 q.h.)
- 833. Theory Seminar (3 q.h.)
- 834. Electronic Music I (2 q.h.)
- 835. Electronic Music II (2 q.h.)
- 840. Instrumentation (4 q.h.)
- 841. Music Workshop (May be repeated to a maximum of 8 q.h. for degree credit.) (1-4 q.h.)
- 851. Woodwind Pedagogy (2 q.h.)
- 852. Woodwind Literature (3 q.h.)
- 858, 859. Piano Pedagogy (2+2 q.h.)
- 860. Piano Literature (4 q.h.)
- 869. Organ Literature (3 q.h.)
- 871. Baroque Music (3 q.h.)
- 872. 18th Century and Viennese Classical School (3 q.h.)
- 873. Opera History (3 q.h.)
- 874. 19th Century Romantic Period (3 q.h.)
- 878. Selected Topics in Music History (3 q.h.)
- 879. Vocal Literature (3 q.h.)
- 880. Vocal Pedagogy (2 q.h.)
- 882. String Pedagogy (2 q.h.)
- 884. History and Literature of Brass Instruments (3 q.h.)
- 885. Brass Pedagogy (2 q.h.)
- 887-888-889. Piano Duet-and-Duo Playing (1+1+1 q.h.)
- 890, 891, 892. Chamber Music with Piano (1+1+1 q.h.)

## Music Performance

- 1) Assignments of students to teachers are made by the Coordinators of Keyboard, Voice, String, Woodwind, Brass, and Percussion Studies. Requests for change of teacher should be addressed to them.
- 2) Students registered for 6 q.h. courses receive 75 minutes of individual instruction weekly and practice three hours daily. Students registered for 4 q.h. courses receive 50 minutes of individual instruction weekly and practice two hours daily. Students registered for 2 q.h. courses receive 25 minutes of individual instruction weekly and practice one hour daily. Students registered for 6 q.h. and 4 q.h. courses are required to attend the weekly seminars held by their individual instructors.
- 3) Students in the performance major course (907-908-909) must present a one-hour public recital. Selections from the recital program must be performed before the appropriate faculty at least 30 days prior to the recital date. The supporting document must be submitted at least 30 days before the recital hearing date.
- 4) Students who fail to meet the standards of the faculty in the area of their performance study may be required to reduce the number of credit hours for which they register in subsequent quarters, or they may be required to withdraw completely from the course sequence.
- 5) Students may transfer from major to concentration or minor courses according to the Performance Course Equivalency Table shown below, subject to approval by the appropriate performance faculty.
- 6) Examination and performance requirements are the responsibility of the appropriate performance faculty.

## KEYBOARD INSTRUMENTS

### Piano

907-908-909. Advanced technical studies and etudes. Repertoire to include representative selections from the larger works of major eighteenth-, nineteenth-, or twentieth-century composers. One-hour recital. Prereq.: Piano 809 or equivalent. 6+6+6 q.h.

### Harpsichord

907-908-909. Repertoire selected from larger works of all style periods with special emphasis on early and contemporary works. Continued study of style and freedom in continuo playing. One-hour recital. Prereq.: Harpsichord 809 or equivalent. 6+6+6 q.h.

### Organ

907-908-909. Technical studies as required by instructor. Repertoire to include larger works by major composer from several style periods. One-hour recital. Prereq.: Organ 809 or equivalent. 6+6+6 q.h.

## 108 COURSES

### PERFORMANCE COURSE EQUIVALENCY TABLE

Q.H.	Course Number		
0		500	
2	501	504	
4	502		
6	503	505	
8	601		
10	602	506	
12	603		
14	701	604	607
16	702		
18	703	605	
20	801		608
22	802	606	
24	803		
26	901	704	609
28	902		
30	903	705	
32			707
34		706	
36			
38		804	708
40			
42		(805)	

Q.H.	Course Number		
42		805	(708)
44		709	
46		806	
48			
50		904	807
52			
54		905	
56			808
58		906	
60			
62			809
64			
66			
68			907
70			
72			
74			908
76			
78			
80			909
82			
84			

### VOICE

907-908-909. Advanced vocal technique and literature; development of interpretation and characterization. Repertoire to include songs in Italian, French, German, and English; oratorio and opera arias; solo cantatas; and twentieth-century art songs, which must include works by American and English composers. One-hour recital. Prereq.: Voice 809 or equivalent.

6+6+6 q.h.

### STRING INSTRUMENTS

#### Violin

907-908-909. Advanced etudes, such as those by Paganini, Bach, *Partitas and Sonatas*. Modern repertoire, such as Bartok, Hindemith, and Prokofiev. Concertos such as those by Brahms and Tchaikovsky. One-hour recital. Prereq.: Violin 809 or equivalent.

6+6+6 q.h.

#### Viola

907-908-909. Scales, arpeggios, and double-stops for the complete range of the instrument based on Flesch and Sevcik. Studies such as those by Garnies and Dolesje; sonatas such as those by Hindemith, Bach, and Beethoven; solos such as Block, *Rhapsodie*; concertos such as those by Haydn. One-hour recital. Prereq.: Viola 809 or equivalent.

6+6+6 q.h.

#### Violoncello

907-908-909. Scales and arpeggios in four octaves with varied bowings, and in thirds and sixths; etudes such as those by Popper and Duport; sonatas such as those by Schubert (*Arpeggione*),

Debussy, and Prokofiev; concertos such as those by Schumann or Shostakovich. One-hour recital. Prereq.: Violoncello 809 or equivalent. 6+6+6 q.h.

### String Bass

907-908-909. Studies such as those by Simandl, Hrabě, and Zimmerman; sonatas such as those by Marcello, Eccles, or Vivaldi; concertos such as those by Dittersdorf or Bottesini. One-hour recital. Prereq.: String Bass 809 or equivalent. 6+6+6 q.h.

## WOODWIND INSTRUMENTS

### Flute

907-908-909. Advanced technical studies and etudes. Repertoire to include representative solo and chamber works by composers from all periods with additional emphasis on orchestral style. One-hour recital. Prereq.: Flute 809 or equivalent. 6+6+6 q.h.

### Oboe

907-908-909. Advanced technical studies and etudes. Repertoire to include representative solo and chamber works by composers from all periods with additional emphasis on orchestral style. One-hour recital. Prereq.: Oboe 809 or equivalent. 6+6+6 q.h.

### Clarinet

907-908-909. Advanced technical studies and etudes. Repertoire to include representative solo and chamber works by composers from all periods with additional emphasis on orchestral style. One-hour recital. Prereq.: Clarinet 809 or equivalent. 6+6+6 q.h.

### Saxophone

907-908-909. Advanced technical studies and etudes. Repertoire to include representative solo and chamber works by composers from all periods with additional emphasis on orchestral style. One-hour recital. Prereq.: Saxophone 908 or equivalent. 6+6+6 q.h.

### Bassoon

907-908-909. Advanced technical studies and etudes. Repertoire to include representative solo and chamber works by composers from all periods with additional emphasis on orchestral style. One-hour recital. Prereq.: Bassoon 809 or equivalent. 6+6+6 q.h.

## BRASS INSTRUMENTS

### Trumpet

907-908-909. Extensive development in the study of transposition and orchestral excerpts. Advanced studies such as those by Charlier, Bozza, Brandt, Broiles, Tomasi, Pietzsch, and Bodet. Solo literature by Bozza, Purcell, Bach, Hummel, Giannini, Tomasi, and Jolivet. One-hour recital. Prereq.: Trumpet 809 or equivalent. 6+6+6 q.h.

### French Horn

907-908-909. Advanced studies by Bitsch, Chaynes, Ceccarossi, Reynolds, Alphonse, and Schuller; demanding orchestral and ensemble passages; classical, romantic, and contemporary sonatas and concertos. One-hour recital. Prereq.: French Horn 809 or equivalent. 6+6+6 q.h.

### Trombone

907-908-909. Studies by Lafosse, Kahila, Pederson, and Maxted; solos by Creston, Bloch, Stevens, Druckman, Albrechtsberger, and Bach (violoncello suites); Orchestral excerpts. One-hour recital. Prereq.: Trombone 809 or equivalent. 6+6+6 q.h.

## 110 COURSES

### Baritone Horn

907-908-909. Studies by Bozza, Maxted, and Rochut; solos by Stevens, Jacob, Beasley, Boda and Bach (violoncello suites); orchestral and band excerpts. One-hour recital. Prereq.: Baritone Horn 809 or equivalent. 6+6+6 q.h.

### Tuba

907-908-909. Emphasis on solo and chamber performance. Solos by Kraft, Smith, Reck, Wuorinen, Woolfe, Reynolds; Transcription of Bach (violoncello suites). Chamber music by Schuller, Feldman, Smith, Zonn, Etlar, Macero, One-hour recital. Prereq.: Tuba 809 or equivalent. 6+6+6 q.h.

## PERCUSSION INSTRUMENTS

907-908-909. Advanced technical studies on snare drum, timpani, and mallet instruments. Repertoire to include demanding passages from symphonic and ensemble literature, contemporary works for percussion. One-hour recital. Prereq.: Percussion 809 or equivalent. 6+6+6 q.h.

## CONCENTRATION COURSES

904-905-906. Equivalent to courses 807 and 808 in the applicable instrument or voice. No recital requirement. Prereq.: Applicable course 709 or equivalent. 4+4+4 q.h.

## MINOR COURSES

901-902-903. Equivalent to course 609 in the applicable instrument or voice. No recital requirement. Prereq.: Applicable course 608 or equivalent. 2+2+2 q.h.

## MUSIC THEORY AND COMPOSITION

904, 905, 906. *Advanced Composition*. Individual instruction in the composition of larger forms for chorus, orchestra, or chamber ensembles. Prereq.: Consent of instructor. 4+4+4 q.h.

910, 911, 912. *Music Styles*. The study and application of the 18th, 19th, and 20th century compositional techniques. 3+3+3 q.h.

913. *Pedagogy of Theory*. The study and critical analysis of methods for teaching harmony, sight-singing, and ear-training. 3 q.h.

916. *Fugue*. Analysis of the fugal style used in 17th century trio sonatas, and in both volumes of *The Well-Tempered Clavier* by J.S. Bach, Writing 3-4 voice fugues employing imitative and invertible counterpoint. Prereq.: Music 831 (Counterpoint I) or 832 (Counterpoint II). 3 q.h.

920, 921, 922. *Seminar in Materials of Music*. The study of techniques used in musical composition with emphasis in analyzing and writing. Course requirements will be determined by student's field of interest. Can be repeated for credit. Admission to course by permission of instructor. 3+3+3 q.h.

## MUSIC HISTORY AND LITERATURE

940. *Music in the Middle Ages*. The development of polyphonic music early organum to c. 1450, with emphasis on techniques, styles, and forms. Seminar, with readings, reports, and musical illustrations. 3 q.h.

941. *Music in the Renaissance*. Musical developments from c. 1450-1600 dealing with the vocal music of this period, both sacred and secular, and the formulation of independent instrumental styles. Seminar, with readings, reports, and musical illustrations. 3 q.h.

942. *Introduction to Music Bibliography*. Fundamental concepts in bibliographic control with emphasis on the functional and analytic approach to bibliography. 3 q.h.



943. *Seminar in Musicology*. An examination of select problems in musicology. (May be repeated with permission of instructor.) 3 q.h.

## MUSIC EDUCATION

970. *Foundations of Music Education*. An examination of basic principles and techniques of music instruction; contemporary trends viewed from historical perspective. 3 q.h.

971. *Administration and Supervision in Music Education*. The functions and techniques of music supervision and administration; improvement of instruction; problems of music consultants; organization of inservice programs; public and staff relations. 3 q.h.

972. *Seminar in Music Education*. Individual projects and discussion of fundamental issues in music education. Course may be repeated once with permission of instructor. 3 q.h.

973. *Research Methods and Materials in Music Education*. A study of research tools and techniques and their application to problems in music education; critique of research studies; research report required in non-thesis Music Education program. 3 q.h.

974. *Psychology of Music*. Factors in the development of musical skills; a survey of the experimental literature in the field. 3 q.h.

975. *Music and the Humanities*. Designed to aid in the development of interdisciplinary courses involving music and the humanities in the secondary school. 3 q.h.

976. *Directed Study in Conducting*. Study of significant works, vocal or instrumental; special problems in conducting. May be repeated for credit. 3 q.h.

977. *Comparative Music Education*. The study of music education practices in world cultures, including the contributions of Orff, Kodaly, and Suzuki. 3 q.h.

978. *Contemporary Trends in Music Education*. Examination and discussion of music education in contemporary society. Consideration of repertoire, methods, and teaching aids with regard to current needs and emerging trends. 3 q.h.

981. *Elementary School Music Practicum*. Field experiences, demonstrations, and lectures to acquaint the student with the many facets of elementary music instruction. Contemporary trends and innovative programs will be examined; students will be encouraged to introduce certain programs and approaches in their own teaching situations. Prereq.: Teaching experience or student teaching. 3 q.h.

982. *Secondary School Music Practicum*. An examination of the total secondary school music program through guided field experiences, demonstrations, and lectures. The development of curriculum in general music and instrumental and vocal music will be considered in the light of needs and abilities of the student. Prereq.: Teaching experience or student teaching. 3 q.h.

## MUSIC RESEARCH

990, 991. *Thesis I and II*. Individual research and writing culminating in the preparation of a master's thesis. Prereq.: Completion of 30 q.h. course work and approval of thesis proposal by the Dana Graduate Committee. 3+(1 or 3) q.h.

992. *Independent Projects in Music*. Individual research topics in music of a library, laboratory, or field-work nature. Prereq.: Approval of Dana Graduate Committee. 1-6 q.h.

**MUSIC ENSEMBLE**

Graduate students may register for participation in ensemble courses of the Dana School of Music for up to 3 q.h. credit, subject to approval by their faculty advisor. 1 q.h.

002 Concert Choir	014 Women's Chorus
003 Madrigal	015 Collegium Musicum
004 University Chorus	016 Woodwind Ensemble
005 Concert Band	017 Brass Ensemble
006 Marching Band	018 Horn Ensemble
007 Symphonic Wind Ensemble	019 Trombone Ensemble
008 Orchestra	020 Tuba Ensemble
009 Percussion Ensemble	021 Brass Chamber Ensemble
010 String Ensemble	022 Trumpet Ensemble
011 Men's Chorus	023 Jazz Ensemble
012 Opera Workshop	024 Composer's Ensemble
013 Contemporary Music Ensemble	026 Dana Chamber Orchestra
	028 Chamber Winds

**PHILOSOPHY AND RELIGIOUS STUDIES**

Thomas A. Shipka, *Chair of the Department*  
401 DeBartolo Hall  
(216) 742-3448

**Philosophy**

- 800. Theories of Knowledge (4 q.h.)
- 810. Philosophical Classics (4 q.h.)
- 811. Philosophy in America (4 q.h.)
- 812. Contemporary Philosophy (4 q.h.)
- 814. Philosophy of Language (4 q.h.)
- 815. Existentialism (4 q.h.)
- 820. Seminar: Contemporary Philosophical Problems (1-4 q.h.)
- 821. Seminar: Areas of Philosophy (1-4 q.h.)
- 823. Philosophy of Justice (4 q.h.)
- 860. Mathematical Logic (4 q.h.)

**Religious Studies**

- 816. The Makers of Modern Religious Thought (4 q.h.)
- 830. Religion in America (4 q.h.)
- 850. Seminar in Religious Studies (1-4 q.h.)
- 851. Directed Readings in Religion (1-4 q.h.)

**PHYSICS AND ASTRONOMY**

Warren Young, *Chair of the Department*  
2014 Ward Beecher Science Hall  
(216) 742-3616

## Physics

810. Introduction to Quantum Mechanics (4 q.h.)  
 815. Kinetic Theory and Statistical Mechanics (4 q.h.)  
 820. Advanced Quantum and Quantum Statistical Mechanics (4 q.h.)  
 822. Electrodynamics (3 q.h.)  
 826. Elements of Nuclear Physics (3 q.h.)  
 826L. Nuclear Physics Laboratory (1 q.h.)  
 830. Solid State Physics (4 q.h.)  
 835. Spectroscopy (4 q.h.)  
 835L. Spectroscopy Laboratory (1 q.h.)  
 850. Special Topics in Physics (2-5 q.h.)

901, 902. *Classical Mechanics I, II*. Variational principles and Lagrangian equations. The two-body central force problem. Kinematics and dynamics of rigid bodies. Hamiltonian equation of motion; Hamilton-Jacobi theory. Prereq.: Physics 702 and Math 705. 3+3 q.h.

910, 911. *Quantum Mechanics I, II*. Quantum phenomena in relation to classical physics. Schroedinger and Heisenberg picture; angular momentum and scattering theory. Hamiltonian theory of a particle in an electromagnetic field. Pauli principle; identical particles. Prereq.: Physics 702, 822, 705 and Math 706. 3+3 q.h.

915, 916. *Space Science I, II*. Geophysics of the Earth's atmosphere and other planets. Physics of the sun and the solar system. Advances in the International Geophysical Year, 1957-1958; problems of man in space. Prereq.: Physics 510, 610, and Math 705, 706. 3+3 q.h.

920, 921. *Electromagnetic Theory I, II*. Electromagnetic fields in a vacuum; microscopic and macroscopic fields. Methods for calculation of potential problems. Maxwell's equations in the presence of metallic boundaries. Radiation from an accelerated charge. Lienard-Wiechert potentials. Prereq.: Physics 822 and Math 706. 3+3 q.h.

930, 931. *Solid State Physics I, II*. The physics of solid state phenomena including crystal structure, diffraction, crystal binding, lattice vibrations and thermal properties of solids, theory of metals and semi-conductors, superconductivity, dielectric properties of solids, magnetism, and imperfections in solids. Prereq.: Physics 810 or equivalent background. Physics 930 is prereq. to 931. 3+3 q.h.

## POLITICAL SCIENCE AND SOCIAL SCIENCE

William C. Binning, *Chair of the Department*  
 302 DeBartolo Hall  
 (216) 742-3436

### Political Science

800. Select Problems, American Government (3-6 q.h.)  
 840. Select Problems, Comparative Government (3-6 q.h.)  
 860. Select Problems, International Relations (3-6 q.h.)  
 880. Select Problems, Political Thought (3-6 q.h.)

## PSYCHOLOGY

James C. Morrison, *Chair of the Department*  
 34 DeBartolo Hall  
 (216) 742-3401

802. Personality (4 q.h.)
805. Interviewing Techniques (4 q.h.)
806. Vocational Guidance (4 q.h.)
807. Introduction to Counseling (4 q.h.)
808. Psychology of Training and Supervision (4 q.h.)
828. Physiological Psychology (4 q.h.)
836. Psychology of the Exceptional Child: General (3 q.h.)
837. Psychology of the Exceptional Child: Retarded (3 q.h.)
838. Psychology of the Exceptional Child: Gifted (3 q.h.)
903. *Psychology of Learning*. Examination of experimentally determined facts concerning the learning process and their implication for use in school. 3 q.h.
906. *Human Growth and Development*. Expanded aspects of child and adolescent psychology. 3 q.h.
907. *Psychology of Adjustment*. Basic problems dealing with mental health, individual differences, motivation, and minor deviant behavior. 3 q.h.
910. *Statistics I*. An overview of inferential statistics, non-parametrics and concentration on analyses of variance. Prereq.: Completion of Psych. 613, 614, and 724, or their equivalents. Exemption exam will be offered. 3 q.h.
911. *Statistics II*. Multivariate statistics, introduction to modeling, linear and multiple regression procedures. Use of common statistics packages available, such as BIMED and SAS will be emphasized to train the student in their applications. Prereq.: Psych. 910. 3 q.h.
- 920, 921. *Individual Intelligence Testing: Theory and Application I, II*. Intensive study of and supervised practice in the administration, scoring, and interpretation of selected measures of intellectual functioning, with emphasis upon the role of these measures in individual assessment and guidance. Course I will cover the Wechsler scales including the WISC-R and WAIS-R, whereas Course II will cover the Stanford-Binet. Prereq.: 20 q.h. of psychology including Psych. 740 or equivalent, and permission of instructor. 3+3 q.h.
923. *Individual Intelligence Testing: Practicum*. Extensive supervised practice in the administration and interpretation of individual intelligence tests with emphasis upon the development of competence in writing reports tailored for various educational and psychological purposes and upon the interpretation of results in the light of the particular racial, ethnic and socio-economic background of the subject being tested. Prereq.: Psych. 920 or 921. 3 q.h.
940. *Personality Theory*. The study of major personality theories and their implications for psychotherapy and mental health work. Prereq.: Psych. 840. 3 q.h.
950. *Survey of Personality Assessment*. Assessment of personality through interviewing, case histories, and supervised administration and interpretation of objective and projective psychological tests. Prereq.: Psych 840, or permission of instructor. 3 q.h.
955. *Psychopathology*. The study of abnormal behavior with an emphasis placed on psychopathological conditions. Prereq.: Psych. 940. 3 q.h.
980. *Psychological Aspects of Mentally Retarded Children*. An intensive study of psychology and educational psychology in mental retardation; exploration and discussion of paradigm in child psychology, developmental psychology, and personality. 3 q.h.
981. *Seminar in Special Education*. (see Sp. Ed. 981) 1-3 q.h.
990. *Seminar in Psychology*. Study of topics in psychology. To be announced by topic. Prereq.: Permission of instructor. (Repeatable to 9 q.h. with change in topic.) 1-3 q.h.

1000. *Psychopharmacology*. An introduction to the basic principles of pharmacology, a review of the structures and mechanisms of the central nervous system with emphasis on neurotransmission, and a survey of the drugs that especially affect the central nervous system including possible mechanisms of action. 3 q.h.

1010. *Counseling Internship*. (see Coun. 1010) 6-12 q.h.

## SECONDARY EDUCATION

Randy L. Hoover, *Chair of the Department*  
1018 Fedor Hall  
(216) 742-3261

885. *Teaching Strategies I* (Elem. Ed. 885) (3 q.h.)

886. *Teaching Strategies II* (Elem. Ed. 886) (3 q.h.)

887. *Teaching Strategies III* (Elem. Ed. 887) (3 q.h.)

891, 892, 893. *Seminar in Secondary Education* (1-6 q.h.)

894. *Audio-Visual Media* (4 q.h.)

906. *Teaching of Literature*. (see Engl. 906) 4 q.h.

907. *Teaching of Writing*. (see Engl. 907) 4 q.h.

910. *Supervision in Secondary Schools*. Theory and strategies for those who have supervisory responsibilities in secondary schools. Emphasis will be on supervisory competencies and roles. Supervisory models including clinical supervision will be considered. 3 q.h.

922. *Principles of Instruction*. A course for practitioners dealing with principles of pedagogy for both traditional and non-traditional classroom settings. Emphasis is on relationships between instruction and learning outcomes. Historical and cognitive bases for instructional strategies are examined in light of student, teacher, and curriculum variables. 3 q.h.

931. *The Secondary School Curriculum*. Historical development of the American secondary school curriculum, present nature, and recent developments. Study of reports, experiments, and typical programs. The roles of supervisors, administrators, teachers, pupils, and public in the development of curriculums. 3 q.h.

934. *Diagnostic-Prescriptive Education*. Roles and techniques for teachers and administrators in diagnosing learning needs and prescribing appropriate instruction. 3 q.h.

935. *Curriculum Development in VBME*. Systematic study of the components of a course of study for vocational business and marketing education programs, including the selection and organization of competencies and instructional materials for classroom and laboratory instruction. Prereq.: Ed. 826 or equivalent. 3 q.h.

946. *The Supervision of Instruction*. A course dealing with the supervision of instruction and organization of a school designed for those aspiring to be principals or supervisors. Decision-making, supervision, observation of supervisory experiences, direction in educational technology, the various subjects, staff relationships, school organization, pupil personnel, and extra-curricular activities are among the areas considered with emphasis upon elementary or secondary situations as appropriate. 3 q.h.

951. *Interpersonal Communications for Administrators*. Techniques of communicating effectively with teachers, administrators, non-teaching personnel, pupils and parents. Organizing the overall communications program within a school. Related problems. 3 q.h.



957. *Practicum in Language Arts*. Analysis and techniques for teaching the language arts through video-taped lessons of high school and middle school teachers; examination of concepts of learning through various approaches, and in the context of research in the language arts. Practical approaches to the teaching of language, writing and literature. Prereq.: Permission of instructor. 3 q.h.
958. *Instructional Supervision for Non-School Personnel*. Strategies of teaching and supervision including the use of media, the evaluation of instruction and pupil performance, and related personnel issues will be covered. The course is designed for personnel in non-school settings who have teaching or supervisory responsibility in inservice programs. Prereq.: Permission of instructor. 4 q.h.
959. *Law for the Classroom Teacher*. An examination of the rights and responsibilities of teachers and students as determined by constitutional, statutory, and case law. 3 q.h.
971. *Human Relations for the Classroom*. (Coun. 971) The course focuses on skill development in human relations. These skills are studied and integrated with cognate skill development in the classroom, classroom planning and organization conflict resolution, and coping with behavior problems/motivation. Application is made to the classroom environment. 3 q.h.
990. *Independent Study*. (see Elem. Ed. 990) 1-4 q.h.
999. *Thesis*. Prereq.: Approval of department graduate faculty and chair. 3-8 q.h.
1020. *Field Experience in Supervision*. A field experience in supervisory practices. Admission by permission of chair of Secondary Education. Prereq.: Ed. 904, 922, 946, 949, 954, and 1036. 3 q.h.
1025. *Seminar in Secondary Education*. Study of selected topics chosen by the secondary staff. May be repeated by non-degree students. Prereq.: Permission of instructor. 1-6 q.h.
1030. *Human Relations Training for School Personnel*. (see Coun. 1030) 3 q.h.
1032. *Theories of Supervision*. Theories germane to supervision in education on research and theory from education, business, and the applied behavioral sciences. 3 q.h.
1036. *Fundamentals of Curriculum Development*. Historical and social bases for curriculum development in the American school. Principles for determining content and its sequence and grade placement. Theoretical issues and patterns of curriculum organization. 3 q.h.
1040. *Field Experience in Gifted and Talented Education*. (see Elem. Ed. 1040) 3 q.h.
1042. *Professional Development for Classroom Teacher Educators*. A restricted professional development course for classroom teacher educators invited to supervise the instructional program of student teachers and field experience students. The course concentrates on developing analytical observation, conferencing, evaluation and supervision skills based on scientific knowledge and theoretical constructs. Prereq.: Invitation from YSU and endorsement from home school district to serve as a classroom teacher educator. 3 q.h.
1050. *Workshop in English Education*. (see Engl. 1050) 4 q.h.
1051. *English Education*. (see Engl. 1051) 4 q.h.

## SOCIOLOGY, ANTHROPOLOGY AND SOCIAL WORK

James W. Kiriazis, *Chair of the Department*  
419 DeBartolo Hall  
(216) 742-3442

### Sociology

900. *Special Sociological Problems*. Advanced seminars focusing on independent study at the graduate level; Social Organization in a Changing World; Social Disorganization (or Deviance) and Social Controls; Social and Cultural Factors in Personality Development; Minority Relationships: Sociology of Law; Social Change; Comparative Institutions. each 4 q.h.

### Anthropology

910. *Special Anthropological Problems*. Advanced seminars focusing on independent study at the graduate level: archaeology, its methods and functions; human origins and differentiation; anthropology of religion; cultural change and its impact. each 4 q.h.

### Social Work

901. *Social Case Work for Social Guidance Personnel*. The field of social work. Emphasis will be on major institutions of social work important to school guidance personnel and on the values and methods of social casework. Specific topics include the use of relationship, social diagnosis, social work treatment, and social work advocacy. Major institutions surveyed are the juvenile court, mental health agencies and family and children's agencies. 3 q.h.

902. *Child and Society*. The socialization of the pre-school and elementary school child. Consideration of theories and research related to social development, social interaction patterns, and cultural determinants. Primarily geared for graduate students in education. 4 q.h.

905. *Social Gerontology*. Integration and application of gerontological theories, major conceptual issues regarding life span development, and contemporary gerontological concepts and research. Prereq.: Admission to the Graduate School. 4 q.h.

## SPECIAL EDUCATION

Jack D. Dunsing, *Chair of the Department*  
2025 Fedor Hall  
(216) 742-3265

- 802. Education of Exceptional Children (4 q.h.)
- 828. Education of Children with Severe Behavioral Handicaps (3 q.h.)
- 828L. Education of Children with Severe Behavioral Handicaps Laboratory (2 q.h.)
- 833. Education of Mentally Retarded (4 q.h.)
- 834. Education and Training of MSPR (4 q.h.)
- 834L. Practicum in Education and Training of MSPR (2 q.h.)
- 835. Classroom Management for Exceptional Individuals (4 q.h.)
- 836. Education of Multiply-Handicapped Individuals (4 q.h.)
- 851. Social Studies and Social Skills for Mentally Retarded (4 q.h.)
- 852. Language Arts Methods in Special Education (4 q.h.)
- 853. Arithmetic Methods in Special Education (4 q.h.)
- 855. Career and Vocational Education for Handicapped Individuals (4 q.h.)
- 862. Principles of Interaction with Special Needs Students (Coun. 862) (3 q.h.)

863. Learning Disabilities and Behavior Disorders (4 q.h.)
864. Communication and Consultation Skills in Special Education (4 q.h.)
865. Workshop in Special Education (1-6 q.h., may be repeated up to 12 q.h.)
866. Clinical Teaching of Children with Specific Learning Disabilities (4 q.h.)
867. Practicum in Specific Learning Disabilities (4-6 q.h.)
868. Independent Study in Special Education (1-6 q.h., may be repeated up to 6 q.h.)
874. Gifted and Talented Programs (4 q.h.)
878. Teaching Gifted and Talented Students (4 q.h.)
936. *Characteristics and Needs of the Academically Gifted Child*. Introduction to the field of gifted education. An overview of the theoretical and research base for gifted education, including appropriate classroom environment, teacher qualifications, and support services to meet the specific social, emotional, and intellectual needs of academically gifted children. Standards advocated by the state and learned societies will be included. 4 q.h.
976. *Academic Assessment and Remediation in Special Education*. Role of the clinical teacher in special education in diagnostic hypothesis, utilizing assessment techniques, developing strategies for remediation, skills in interpreting and reporting findings of assessment. Prereq.: Spec. Ed. 833 or 863. 3 q.h.
978. *Supervision and Administration in Special Education*. Developing and monitoring a broad range of programs and services for handicapped. Funding resources, personnel selection and development, child tracking, evaluation, individualized education plans, least restrictive placement, and due process procedures. 3 q.h.
979. *Assessment and Remediation of Language and Cognitive Process Dysfunctions in Special Education*. Theory and practice in remediation of basic cognitive processes, especially in areas of language and cognitive skills for the clinical teacher in special education. Prereq.: Spec. Ed. 833 or 863. 3 q.h.
980. *Topical Seminar in Special Education*. Selected topics in special education. May be repeated for different content. 1-6 q.h.
981. *Seminar in Special Education*. (Psych. 981) Exploration of general research and other theoretical studies concerning individuals in special education programs, with particular emphasis on psychological variables in learning. 3 q.h.
983. *Major Concepts in Special Education*. Introduces the teacher to clinical, developmental, and remedial concepts and practices in special education programming. Prereq.: Sp. Ed. 833 or 863. 3 q.h.
984. *Educational Programs for Handicapped Children*. Review of federal and state legislation affecting the handicapped. Procedures for insuring each handicapped child an 'appropriate' educational experience in a 'least-restrictive environment.' Case studies will be used. Appropriate for principalship or supervisory candidates. 3 q.h.
985. *Resource Rooms and Supplemental Services for Special Education*. Designing and organizing facilities and services for handicapped children in the mainstream. For Special Education majors only. 3 q.h.
986. *Severe Behavior Handicaps: Assessment and Classroom Management*. Etiology and nature of behavior disorders. Rationale and procedures for identification, analysis, and management of severe behavior handicapped children in the schools. 3 q.h.
989. *Educational Assessment of Gifted and Talented*. Screening and educational assessment procedures; placement in appropriate learning environments; monitoring systems for individual progress. Prereq.: Ed. 874, 878. 4 q.h.
1021. *Field Experience I*. (see Admin. & Sec. Ed. 1021) 3 q.h.

1040. *Field Experience in Gifted and Talented Education.* (Sec. Ed. 1040) Supervised field experience that incorporates theory, planning, and implementation of curriculum for gifted and talented students; campus seminar held weekly. Prereq.: Ed. 874, 878, Coun. 879, Psych. 838.3 q.h.

1042. *Professional Development for Classroom Teacher Educators.* A restricted professional development course for classroom teacher educators invited to supervise the instructional program of student teachers and field experience students. The course concentrates on developing analytical observation, conferencing, evaluation and supervision skills based on scientific knowledge and theoretical constructs. Prereq.: Invitation from YSU and endorsement from home school district to serve as a classroom teacher educator. 3 q.h.

## **SPEECH COMMUNICATION AND THEATRE**

Alfred W. Owens II, *Chair of the Department*  
2000 Bliss Hall  
(216) 742-3631

### **Theatre**

864. Advanced Directing (4 q.h.)

### **Speech**

852. Decision Making (4 q.h.)

858. Practicum in Speech Communication Research (1-4 q.h.)

898. Seminar in Speech Communication (4 q.h.)

## Graduate Faculty

### ADMINISTRATIVE MEMBERS

Neil D. Humphrey, Ed.D.	President
Bernard T. Gillis, Ph.D.	Provost
George E. Sutton, Ph.D., P.E.	Dean of the William Rayen School of Engineering
Bernard J. Yozwiak, Ph.D.	Dean of the College of Arts and Sciences
Sally M. Hotchkiss, Ph.D.	Associate Provost and Dean of Graduate Studies
James S. Cicarelli, Ph.D.	Dean of the Warren P. Williamson, Jr. School of Business Administration
Victor A. Richley, Ph.D., P.E.	Dean of the College of Applied Science and Technology
David P. Ruggles, Ph.D.	Dean of the School of Education
David Sweetkind, Ph.D.	Dean of the College of Fine and Performing Arts

### DISTINGUISHED MEMBERS

Shaffiq Ahmed, P.E., Professor of Chemical and Metallurgical Engineering: I. Sc., B.E. Met. Engr., University of Calcutta, 1950, 1954; M.S. Met. Engr., University of Illinois, 1958; Ph.D., Case Institute of Technology, 1965.

Javed Alam, Associate Professor of Civil Engineering: B.Sc., B. Tech., Kanpur University, 1972, 1978; M. Engr., Asian Institute of Technology, 1979; Ph.D., Case Western Reserve University, 1982.

Peter Arlow, Associate Professor of Management: B.S. in B.A., Youngstown State University, 1961; M.B.A., University of Akron, 1968; Ph.D., University of Cincinnati, 1979.

Lorraine Y. Baird-Lange, Professor of English: A.B., Catawba College, 1951; M.A., Appalachian State College, 1959; Ph.D., University of Kentucky, 1969.

Jack D. Bakos, Jr., P.E., Professor of Civil Engineering: B.S.C.E., University of Akron, 1963; M.S.C.E., Ph.D., West Virginia University, 1965, 1967.

Richard H. Bee, Professor of Economics: B.S.B.A., M.A., Pennsylvania State University, 1964, 1967; D.B.A., Kent State University, 1976.

Martin E. Berger, Professor of History: B.A., Columbia University, 1964; M.A., Ph.D., University of Pittsburgh, 1965, 1969.

Frederick J. Blue, Professor of History: B.A., Yale University, 1958; M.S., Ph.D., University of Wisconsin, 1962, 1966.

Bege K. Bowers, Associate Professor of English: B.A., Vanderbilt University, 1971; M.A., Ph.D., University of Tennessee, 1973, 1984.

Barbara H. Brothers, Professor of English: B.A., Youngstown State University, 1958; M.A., Case Western Reserve University, 1962; Ph.D., Kent State University, 1973.

John J. Buoni, Professor of Mathematical and Computer Sciences: B.S., St. Joseph's College, 1965; M.S., Ph.D., University of Pittsburgh, 1968, 1970.

Richard Lee Burden, Professor of Mathematical and Computer Sciences: B.A. Albion College, 1966; M.S., Ph.D., Case Western Reserve University, 1968, 1971.

Janet E. Del Bene, Professor of Chemistry: B.S., A.B., Youngstown University, 1963, 1965; Ph.D., University of Cincinnati, 1968.



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## 122 GRADUATE FACULTY

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FIG. 1. Head and thorax of the female, showing the compound eye, the base of the antennae, and the mouthparts.

DESCRIPTION OF THE SPECIES

The female is larger than the male, the head being more rounded and the thorax more robust. The compound eye is large and prominent, and the antennae are long and segmented. The mouthparts are adapted for sucking, and the legs are long and slender.

HOLOTYPE AND PARATYPE

The holotype is a female, collected in the state of Texas, near the city of Austin, on the 15th of August, 1912. The paratype is a male, collected in the same locality on the same date.

HOLOTYPE AND PARATYPE

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