

CLARION
UNIVERSITY

CLARION UNIVERSITY OF PENNSYLVANIA
Graduate Catalog
1999-2001

Clarion University of Pennsylvania

Clarion, Pennsylvania 16214-1232

Catalog Issue 1999-2001

Accredited by:

American Assembly of Collegiate Schools of Business
Master of Business Administration Graduate Program
American Library Association
Library Science Graduate Program
Council on Academic Accreditation of the American Speech-Language-
Hearing Association
Communication Sciences and Disorders Graduate Program
International Association of Counseling Services Inc.
Department of Counseling Services
Middle States Association of Colleges and Schools
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Pennsylvania Association of Graduate Schools

Table of Contents

Academic Calendars	iv
General Information	1
Graduate Study	4
Biology—Master of Science	16
Business—Master of Business Administration	24
Communication—Master of Science	32
Communication Sciences and Disorders—Master of Science	38
Education—Master of Education Degrees	44
M.Ed. in Elementary Education	44
M.Ed. in Reading	45
Reading Specialist Certification	46
English—Master of Arts	51
Library Science—Master of Science in Library Science	55
School Library Media Certification	57
Certificate of Advanced Studies	57
Mathematics—Master of Education	64
Nursing—Master of Science	68
Science Education—Master of Education	74
Special Education—Master of Science	81
Directories	88
Graduate Faculty	89
Index	96

Clarion University

Academic Calendar 1999-2000

(Subject to change without notice)

Fall Semester 1999

Registration for day and evening classes	Monday, August 30
Classes begin 8 a.m.	Monday, August 30
Labor Day Holiday	Monday, September 6
Midsemester break begins 10 p.m.	Thursday, September 30
Midsemester break ends 8 a.m.	Monday, October 4
Thanksgiving holiday begins 10 p.m.	Tuesday, November 23
Thanksgiving holiday ends 8 a.m.	Monday, November 29
Classes end 10 p.m.	Friday, December 10
Reading day	Saturday, December 11
Final examination period begins	Monday, December 13
Final examination period ends 10 p.m.	Friday, December 17
Semester ends 10 p.m.	Friday, December 17
Winter Commencement	Saturday, December 18
Semester grades due from faculty	Thursday, December 23

Spring Semester 2000

Martin Luther King Jr. birthday observed	Monday, January 17
Registration for day and evening classes	Tuesday, January 18
Classes begin 8 a.m.	Tuesday, January 18
Winter holiday begins 10 p.m.	Friday, February 25
Winter holiday ends 8 a.m.	Monday, March 6
Spring vacation begins 10 p.m.	Wednesday, April 19
Spring vacation ends 8 a.m.	Wednesday, April 26
Classes end 10 p.m.	Friday, May 5
Reading day	Saturday, May 6
Final examination period begins	Monday, May 8
Final examination period ends 10 p.m.	Friday, May 12
Semester ends 10 p.m.	Friday, May 12
Spring Commencement	Saturday, May 13
Semester grades due from faculty	Thursday, May 18

Summer Sessions - 2000

Session I: Pre-session	May 15-June 2
Session I: Regular session	June 5-July 7
Session II: Regular session	July 10-August 11

Fall Semester 2000

Registration for day and evening classes	Monday, August 28
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Clarion University

Academic Calendar 2000-2001

(Subject to change without notice)

Fall Semester 2000

Registration for day and evening classes	Monday, August 28
Classes begin 8 a.m.	Monday, August 28
Labor Day Holiday	Monday, September 4
Midsemester break begins 10 p.m.	Thursday, October 12
Midsemester break ends 8 a.m.	Monday, October 16
Thanksgiving holiday begins 10 p.m.	Tuesday, November 21
Thanksgiving holiday ends 8 a.m.	Monday, November 27
Classes end 10 p.m.	Friday, December 8
Reading day	Saturday, December 9
Final examination period begins	Monday, December 11
Final examination period ends 10 p.m.	Friday, December 15
Semester ends 10 p.m.	Friday, December 15
Winter Commencement	Saturday, December 16
Semester grades due from faculty	Thursday, December 21

Spring Semester 2001

Martin Luther King Jr. birthday observed	Monday, January 15
Registration for day and evening classes	Tuesday, January 16
Classes begin 8 a.m.	Tuesday, January 16
Winter holiday begins 10 p.m.	Friday, February 23
Winter holiday ends 8 a.m.	Monday, March 5
Spring vacation begins 10 p.m.	Wednesday, April 4
Spring vacation ends 8 a.m.	Wednesday, April 11
Classes end 10 p.m.	Friday, May 4
Reading day	Saturday, May 5
Final examination period begins	Monday, May 7
Final examination period ends 10 p.m.	Friday, May 11
Semester ends 10 p.m.	Friday, May 11
Spring Commencement	Saturday, May 12
Semester grades due from faculty	Thursday, May 17

Summer Sessions - 2001

Session I: Pre-session	May 14-June 1
Session I: Regular session	June 4-July 6
Session II: Regular session	July 9-August 10

Fall Semester 2001

Registration for day and evening classes	Monday, August 27
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General Information

The University Mission

The mission of Clarion University is to provide a broad range of instructional programs, including associate's degree programs; upper-division courses for students who have obtained the first two years of post-secondary education elsewhere; baccalaureate degree programs in the arts and sciences and applied fields, including teacher education; graduate programs in selected fields; and continuing education to meet the needs and interests of citizens.

Clarion University is committed to seeking excellence in all areas of higher education within its mission and to provide an environment which challenges students to develop their talents, to extend their intellectual capacities and interests, to expand their creative abilities, and to develop a life-long respect and enthusiasm for learning. The university is dedicated to helping students see in themselves what they may become, assisting them with an opportunity to develop the knowledge, skills, and attitudes required for entrance into a variety of careers and for participation in a free society as enlightened citizens capable of making wise and responsible choices.

In meeting its commitments, the university recognizes its responsibility to admit and retain qualified and enterprising students; to secure and maintain highly qualified and dedicated faculty and staff; to provide an intellectual and social climate conducive to the fullest development of students, to strive for inspired teaching and effective courses of study; to maintain high academic and professional standards for students, faculty, and staff; to provide classrooms, libraries, laboratories, and other facilities necessary to support high quality undergraduate and graduate programs; to encourage students and faculty to contribute to new knowledge through research activities; and to provide community and public service programs which are responsive to the needs of society and consistent with the responsibilities and mission of the university.

Approved by the Council of Trustees on 9/17/86

Graduate Studies Mission

Clarion University recognizes the role that a high quality graduate program plays in maintaining excellence in the institution. The opportunity to work with graduate students, the challenge to remain at the forefront in the discipline, and the stimulus resulting from research all contribute to the recruitment, development, and retention of a concerned, productive faculty. Clarion University shall maintain a graduate program which supports the goals of the university.

Non-Discrimination Statement

It is the policy of Clarion University of Pennsylvania that there shall be equal opportunity in all of its educational programs, services, and benefits, and there shall be no discrimination with regard to a student's or prospective student's race, color, religion, sex, national origin, disability, age, sexual orientation/affection, veteran status, or other classifications that are protected under Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and

other pertinent state and federal laws and regulations. Direct equal opportunity inquiries to: Assistant to the President for Social Equity, 207 Carrier Administration Building, Clarion, PA 16214-1232, 814-226-2000; and direct inquiries regarding services or facilities accessibility to 504/ADA Coordinator (Assistant Director for Social Equity) 207 Carrier Administration Building, Clarion, PA 16214-1232, 814-226-2000; (or to the Director of the Office for Civil Rights, Department of Education, 330 Independence Avenue, SW, Washington, DC 20201).

Clarion Campus

Now well into its second century of service to the people of Pennsylvania, Clarion University has successively been Carrier Seminary, a state normal school, a state teachers' college, a state college, and beginning July 1, 1983, a university in the State System of Higher Education. Each phase of this development has marked a stage in the continuing effort of the institution to respond to the educational needs and aspirations of increasing numbers of students.

Today, Clarion University is a multi-purpose institution with an enrollment of approximately 6,000 students offering associate's degrees in five areas; more than 70 baccalaureate programs leading to degrees in the arts, fine arts, nursing, and sciences; and 12 graduate programs leading to master's degrees in the arts, business administration, education, library science, nursing, and sciences.

The main campus of the university contains 99 acres and 43 buildings, the majority of which were constructed within the past 20 years. Beyond the main campus, situated at the west end of the town of Clarion, is a 27-acre athletic complex with football, baseball, and practice fields and Memorial Stadium, seating 5,000 spectators. The university is within the Borough of Clarion some two miles north of Interstate 80 at Exits 9 and 10 and is approximately 2½ hours' driving time from the urban centers of Pittsburgh, Erie, and Youngstown. High on the Allegheny Plateau overlooking the Clarion River, the rural setting is in the midst of one of Pennsylvania's most scenic resort areas. The rolling wooded countryside, interspersed with small farms, affords some of the most enjoyable outdoor activities to be found anywhere in Northwestern Pennsylvania, and the Clarion River provides an excellent setting for summer boating, swimming, and aquatic sports.

Among facilities supporting programs at Clarion University are the Carlson and Suhr Libraries; the George R. Lewis Center for Computing Services operating Digital Equipment Corporation computers and associated equipment; several microcomputer laboratories; a planetarium; modern science laboratories having excellent instrumentation; well-equipped support areas for special education and speech pathology and audiology; a modern business administration building; technologically equipped classrooms for library science; radio and television studios and experimental audio-visual facilities in the Department of Communication; and a writing center, tutorial services, and a counseling center to assist students who can benefit from these services.

Venango Campus

Venango Campus of Clarion University, established in 1961, was the first branch campus in the Pennsylvania State System of Higher Education. Located in Oil City, Venango Campus is scenically situated on 62 acres surrounded by heavily-wooded foothills overlooking the Allegheny River.

Venango Campus is appropriate for students who prefer the atmosphere of a small campus with its capacity for providing individual attention for each student and for permitting and encouraging varied student initiated activities.

Venango Campus offers programs for both part-time and full-time students. Students may study for one of six associate's degrees in arts and sciences, business administration, legal business studies, nursing, rehabilitative services, and certified occupational therapy assistant.

The School of Nursing, which is located at the Venango Campus, also offers a Bachelor of Science in Nursing program at the Oil City Campus and the Pittsburgh site, located at the West Penn Hospital School of Nursing in Bloomfield. A Master of Science in Nursing degree with a family nurse practitioner emphasis is offered jointly by Clarion University and Slippery Rock University Nursing Departments. Courses for this master's program are offered at sites in Clarion, Oil City, Pittsburgh, Slippery Rock, and Cranberry Township.

Graduate Study at Clarion University

Eligibility for Admission

Individuals seeking regular full admission to a graduate program must meet the minimum admission requirements for the College of Graduate Studies and any additional requirements of the program. To meet the minimum requirements for admission to the College of Graduate Studies an applicant must provide evidence of:

- A bachelor's degree or its equivalent from an acceptably accredited college or university. Individuals who have not yet completed the baccalaureate degree may submit transcripts for course work completed, along with application materials. Final transcripts noting the completion of the degree will be required.
- A minimum quality-point average of 2.75/4.00 at the undergraduate level. Some programs require a higher undergraduate quality-point average. Please review the program admission requirements listed elsewhere in this catalog.

Individuals not meeting the quality-point average requirement of a graduate program may be eligible for regular admission when the lower quality-point average is evaluated in terms of supplementary factors, including letters of reference, examination scores on such instruments as the Graduate Record Examination, Graduate Management Admission Test, and/or the Miller Analogies Test, or achievement in graduate-level course work.

Information regarding the Miller Analogies Test, the Graduate Record Examination (GRE) and the Graduate Management Admission Test (GMAT) may be obtained from the College of Graduate Studies.

Applicants should refer to the admission requirements of specific programs as listed in this bulletin.

Categories of Admission

Admitted applicants will be classified in one of the following categories of admission.

Regular Full Admission

Individuals meeting all of the admission requirements for a graduate program shall be granted regular full-admission status. Only individuals with regular full-admission status are eligible for graduate assistantships. Individuals must achieve regular full-admission status before they graduate. A student may apply and be admitted to a graduate program during his/her last year of undergraduate study. This admission, however, is contingent upon the student providing the Graduate College an official final undergraduate transcript which indicates the baccalaureate degree has been awarded.

Provisional Admission

Individuals not meeting all of the admission requirements for a graduate program *may* be admitted on a provisional basis. In such cases, admission will be based upon specific conditions that the student must meet in order to be reclassified as regular full admission. Individuals admitted on a provisional basis are not eligible for graduate assistantships. Individuals admitted on a provisional basis are not guaranteed regular full-admission status.

Courtesy/Transient Admission

A graduate student from another institution may enroll for graduate courses at Clarion University on a courtesy basis if he or she intends to transfer the credit for the course to another institution. Information about courtesy admission may be obtained from the College of Graduate Studies.

Non-Degree Status Admission

Occasionally individuals will want to engage in graduate study without formally entering a graduate program. Such individuals should apply for a *non-degree admission status* at the time of application. All admission requirements must be met. Individuals remaining in this status may not receive a graduate degree. Courses taken while a person is in this status will be identified as *non-degree* on the student's transcript. The non-degree student who, after taking courses in non-degree status determines to seek a graduate degree, must be formally admitted to a graduate degree program under regular admission procedures. Graduate programs may or may not accept courses taken while a student is in non-degree status. No program may accept more than nine credits taken in non-degree status. Applicants admitted on a non-degree basis are not guaranteed regular full admission status. Certain course restrictions may apply for non-degree students.

Admission Procedures

Application forms and information about graduate programs may be obtained by writing to:

College of Graduate Studies
Clarion University of PA
108 Carrier Administration Building
840 Wood Street
Clarion, PA 16214-1232

Routine admission policy requires that all graduate applicants submit:

1. a completed application form;
2. official transcripts issued from colleges or universities in sealed envelopes of all undergraduate and graduate work (partial transcripts are acceptable, but evidence of a degree must be submitted before a student may enroll in classes);
3. *three current letters of reference; and
4. a \$25 non-refundable application fee.

Some graduate programs require additional information or procedures.

*May not be required of non-degree students.

Admission Application Deadlines for Regular, Provisional, Transient, and Non-Degree Admissions

The following deadlines apply to graduate applicants.*

Communication Sciences and Disorders applicants: February 15—last date to complete an application file for upcoming academic year.

MSN applicants—last date to complete an application file are

Fall:	July 1
Spring:	November 1
Summer:	April 15

Other programs

Fall:	August 1	last date to complete an application file
Spring:	Dec. 1	last date to complete an application file
Summer:	May 1	last date to complete an application file for Summer I
	June 1	last date to complete an application file for Summer II

*International students must complete an application file at least four months prior to the term applicant wishes to begin study. See section below on “Admission of International Students.”

Admission of International Students

Clarion University welcomes international students to its campus and has an Office of International Programs to assist students from other countries in achieving a successful educational experience at Clarion. International students may write to:

Office of International Programs
Clarion University of Pennsylvania
174 Carlson, 840 Wood Street
Clarion, PA 16214-1232 U.S.A.

International students seeking admission to the Graduate College should follow directions specified for all students under “Admission and Degree Requirements.” In addition, the international student applicant must satisfy the following requirements:

1. Submit his or her application for admission at least four months prior to the term in which he or she wishes to begin study at Clarion.
2. Demonstrate English language proficiency. Acceptable evidence of proficiency is successful completion of Test of English as a Foreign Language (TOEFL) with a score of 550 (600 required for the program in communication, biology, and communication sciences and disorders); or satisfactory completion of a bachelor’s degree from an accredited U.S. college or university. Additionally, communication sciences and disorders requires a score of 200 on the Test of Spoken English (TSE). Other evidence may be approved by the Graduate College, such as affirmation of proficiency by a Clarion faculty member, other individual, or organization known to Clarion University.
3. Furnish evidence of adequate financial support on the Financial Support Statement form. The applicant must provide an official statement from an authorized bank

certifying that sufficient funds are available to the student to cover costs of university fees and general living expenses for one academic year of study in the United States. Immigration and Naturalization form I-20 will not be issued until the international applicant has submitted the required evidence of financial support.

4. Carry a full program of studies (at least nine semester hours) upon admission and matriculation. U.S. Immigration and Naturalization Service regulations require students holding an “F” or “J” visa to carry a full program of study.
5. Be covered by adequate health insurance. Due to the high cost of health care in the United States, it is for the benefit of all international students that they are required to subscribe to the group health insurance policy with which the university has contracted. For further information on insurance, please contact the Office of International Programs.

Academic Policies and Procedures

Academic Honesty Policy

Students at Clarion University shall maintain a high standard of honesty in scholastic work. As members of the university community, students have a responsibility to be familiar with the conduct regulations found in the university catalogs, *Student Handbook and Calendar*; *Residence Hall Handbook*; *Student Rights, Regulations, and Procedures Handbook*, and other university documents. Among the conduct regulations addressed are acts of academic dishonesty, including plagiarism or cheating on assignments, examinations, or other academic work, or without prior approval of the instructor, submitting work already done for another course.

Students shall avoid all forms of academic dishonesty, including but not limited to:

1. **Plagiarism**—the use of another’s words without attribution and without enclosing the words in quotation marks. Plagiarism may also be defined as the act of taking the ideas or expression of ideas of another person and representing them as one’s own—even if the original paper has been paraphrased or otherwise modified. A close or extended paraphrase may also be considered plagiarism even if the source is named.
2. **Collusion**—when specifically prohibited in advance by the instructor, collaborating with another person in the preparation of notes, themes, reports, or other written work offered for credit.
3. **Cheating on an examination or quiz**—giving or receiving information or using prepared material on an examination or quiz.
4. **Falsification of data**—manufacturing data, falsification of information, including providing false or misleading information, or selective use of data to support a particular conclusion or to avoid conducting actual research.

Complaints of academic dishonesty may be brought against a student by any member of the academic community. Sanctions for academic dishonesty can range from a failing grade on a particular assignment or examination to dismissal from the university based on the seriousness of the action and whether it is part of a pattern of academic dishonesty. Instructors imposing a lowered or failing grade on an assignment or course as a result of a charge of academic dishonesty must inform the student. Students have the right to appeal instructor decisions (*Student Rights, Regulations, and Procedures Handbook*) either through the grade-appeal process (see section on Student Rights in the Classroom) or directly to the Conduct Board (see section on Adjudication Appeals) depending on the nature of the

dispute. Sanctions extending beyond a particular course, such as suspension or dismissal from an academic program or from the university, can only be imposed as the result of complaints filed under the Disciplinary Procedures Code and after Formal Hearings under this code.

Good Academic Standing

All graduate students are expected to remain in good academic standing by maintaining a cumulative quality-point average of 3.00/4.00 and earning no more than six semester hours of “C” or lower grades in graduate courses.

Students who do not maintain a cumulative quality-point average of 3.00/4.00 and/or who earn more than six hours of credit with grades below a “B” are automatically placed on *probation*. A student placed on probation must return to “good academic standing” through grades earned in course work during the next semester or summer session in which he or she enrolls. A student may be removed from probation by:

- A. Taking additional courses in his or her program and earning grades sufficient to raise the cumulative average to 3.00/4.00 or above. This single measure may be sufficient unless the student has more than six semester hours of “C” grades.
- B. Repeating courses in which the original grade is less than “B”. A repeat course grade will replace the original grade for quality-point calculations. A maximum of six semester hours of credit may be repeated. Library science students receiving a grade of less than “B” in two courses are disqualified as a candidate in that degree program.

Failure to meet this requirement will result in the student being dropped from the graduate program in which he or she is enrolled.

A student placed on *probation* automatically loses his or her graduate assistantship. A reapplication for an assistantship will be required once he or she has returned to “good academic standing.”

Transfer of Credit

Some graduate programs allow students to transfer credit for graduate courses taken at other accredited institutions. It is university policy that no more than 30 percent of the total credits for a degree may be transfer credits. Courses transferred must be certified as graduate level on the transcript and must have a grade of “B” or better. Transfer credit course grades are not computed in the Clarion quality-point average.

Courses already credited toward an earned degree may not be used for a second degree. Correspondence course credits are not accepted for transfer. Course credit will not be transferred until the course has been evaluated and approved. A student enrolled in a degree program at Clarion who wishes to take a course at another institution for transfer to Clarion should obtain prior approval from his or her advisor and department chair. Transfer credit forms are available in the Graduate Studies office.

Residency

Seventy percent of all credits required for completion of a graduate degree must be earned in course work offered by Clarion University. All graduate-degree programs require a minimum of 30 semester hours of credit. Individual programs may require more than 30 semester hours.

Timeliness of Enrollment and Completion of Degree

It is expected that an applicant admitted to graduate study will enroll for course work at once. Students who do not enroll at Clarion for graduate courses in programs to which they are admitted within 12 months following admission may be required to reapply before they can enroll. Information about eligibility to enroll in classes may be obtained from the Graduate College.

A degree must be completed within six years from the date of initial enrollment. Extensions may be allowed only by approval of the department chair, dean of the college in which the student's program resides, and the dean of the College of Graduate Studies.

Full-Time Status

A graduate student enrolled in nine semester hours of course work in a term is considered a full-time student.

400-Level Courses

Not all 400-level courses can be taken for graduate credit. Students should consult with graduate program coordinators or their advisors to determine 400-level courses that have been approved for graduate credit. The maximum number of 400-level courses accepted toward degree requirements varies among the graduate programs. See specific program descriptions and requirements.

Withdrawals

All class withdrawals must be made through the Office of the Registrar. Classes from which a student withdraws during the period of drop/add will not appear on his or her record. Withdrawals between the end of the second and ninth weeks may be made without penalty. After the beginning of the tenth week of a semester or the second half of a summer session, a course from which a student withdraws shall be finally reported with a grade of "E." Exceptions may be made for withdrawals due to extenuating circumstances such as illness or some other unavoidable occurrence.

If a student is on probation at the time of withdrawal from all classes and the withdrawal is after the twelfth week of the semester, he or she will not be permitted to return for the following semester unless the withdrawal is based on extenuating circumstances.

If a withdrawal is not made through the Office of the Registrar, a failing grade will be recorded for the affected course(s).

Any student who withdraws from the university either during or at the end of a semester must notify the Office of the Registrar of his or her intention to withdraw and the reason for withdrawal. This is necessary for completion of the student's permanent record. Failure to comply with this regulation will constitute an unofficial withdrawal and may affect the student's chances of future readmission or his or her obtaining an honorable dismissal.

Grading System

A	excellent	I	indicates incomplete work
B	good	P	passing
C	satisfactory	W	indicates withdrawal from a course
D	poor	WX	indicates withdrawal from the university
E	failure	Z	grade not submitted (Temporary)
CX	credit by examination	AU	audit
IP	in progress		

Auditing Courses

With the permission of the instructor, interested students may audit courses if there is space available in the course from the first day of class and up until the end of the drop/add period. Students must declare their intentions in writing to the Office of the Registrar prior to the end of the drop/add period. Laboratory courses may not be taken as an audit. Students who enroll in a course for credit may change to an audit grade only during the drop/add period. Likewise, students who enroll in a course to audit may only change to credit during this same period.

Courses taken as an audit will be recorded on the official transcript with a grade of “AU”; no credit or letter grade will be received. Graduate-level courses taken as an “audit” cannot be counted as credits in a degree program and cannot be repeated for credit or a letter grade at a later time.

Incomplete Grades

The “I” grade may be used when a student has completed the major portion of the requirements for a given course, but for reasons beyond expected control, such as illness or family emergency, cannot complete all requirements. An incomplete is used also for research or problems courses where projects necessarily extend beyond the termination of the semester or session. Normally, incomplete grades must be removed by the end of the first semester subsequent to the awarding of the incomplete. Extensions may be granted if the instructor awarding the incomplete deems that more time is necessary to fulfill course requirements. Research and thesis incomplete grades normally continue beyond one semester.

An incomplete that is not converted to a final grade by the end of the semester following its issuance and is not approved for extension by the instructor becomes a failing grade.

No one may be cleared for graduation with “I” grades on record.

In Progress Grades

The grade “IP” is given for thesis work and/or courses at the graduate level that might take more than a semester for completion. The grade “IP” is given only when the work in a course extends beyond the semester or term. It implies satisfactory performance. The grade “IP” will not alter the quality-point average of the student since hours attempted, hours earned, and quality points earned will be entered in cumulative totals. The “IP” grade shall remain on the student’s transcript until the instructor submits a grade.

Advisement

Upon admission to a graduate program, a student is assigned an advisor. The advisor will assist the student in planning an individual program and in maintaining progress within the program.

Research, Theses, and Comprehensive Examinations

Research, theses and/or comprehensive examination requirements are established by the individual graduate programs within the university. The student should refer to the section of this catalog presenting specific programs to determine exact requirements.

Student Responsibility for Academic Requirements

Provisions in the Clarion graduate catalog cannot be considered an irrevocable contract between the university and the student.

The university makes every effort to keep information in the catalog current. It must reserve the right, however, to amend any academic, administrative, or disciplinary policies or regulations and to update fees or service charges described in this catalog without prior notice to persons affected.

Students are held responsible for reading and understanding the academic, administrative, and disciplinary policies or regulations and for understanding the general education requirements as published in the catalog when they matriculate. They are held responsible for the requirements of a major in effect at the time they officially declare a major. If students change majors, they are responsible for the requirements of the major in effect when they officially change majors.

Requirements for graduation as well as those for various curricula and degree programs may change after students matriculate at Clarion. Such changes will not be retroactive, although students will have the option to elect to meet the new program requirements, if desired. Exceptions may be necessary when changes in professional certification or licensure standards mandate such changes in requirements or programs.

Fees for Graduate Study

All fees are subject to change without notice. Unless otherwise noted, all payments must be made by check or money order drawn to the order of Clarion University.

Summary of Fees (Per Semester)

I. APPLICATION FEE (non-refundable)	\$25.00
II. BASIC GRADUATE FEES (subject to change without notice)	
Pennsylvania residents:	
Full-time (9-15 credits)	\$1,734.00
Each additional credit over 15	\$193.00
Part-time (fewer than 9 credits)	
Per credit	\$193.00
Non-Pennsylvania residents:	
Full-time (9-15 credits)	\$3,118.00
Each additional credit over 15	\$346.00
Part-time (fewer than 9 credits)	
Per credit	\$346.00
III. RESIDENCE HALL AND DINING FEES	
Residence and dining (double room and standard meal plan)	\$1,740.00
All residence hall students must pay for both residence hall and dining	
Dining only (standard 19-meal plan)	\$690.00
IV. INSTRUCTIONAL SUPPORT FEE	
This fee is a percentage of the tuition charge:	
PA Resident—10%	Non-PA Resident—5.56%
V. HEALTH CENTER FEE	
This fee is a percentage of the tuition charge:	
PA Resident—3.9%	Non-PA Resident—2.17%
VI. STUDENT CENTER FEE	
This fee is a percentage of the tuition charge:	
PA Resident—6.6%	Non-PA Resident—3.67%
VII. LATE FEE	\$25.00
A late fee will be assessed to students who have not paid in full or have not made appropriate arrangements for payment by registration day.	
VIII. THESIS BINDING	\$47.25
Minimum three copies @ approximately \$15.75 per copy. Final cost subject to change.	
Payment to be made when thesis submitted to Graduate Office for binding.	

IX. STUDENT ACTIVITY FEE

All students with six or more credits are required to pay a Student Activity Fee assessed as follows:

1-8 credits:	\$25.00
9 or more credits:	\$50.00
X. TRANSCRIPT FEE (one-time charge)	\$15.00
Transcript release is limited to a maximum of three per request per day.	
XI. GRADUATION FEE	\$15.00
A graduation fee is charged to each graduating student.	

Refund Policies

Basic Fees, University Residence Hall, Dining Charges, and Student Activity Fee

Refunds are not granted on an automatic basis. A student eligible for a partial refund of basic fees and residence hall charges must officially withdraw from the university through the Registrar's Office, located in 122 Carrier Administration Building. Refunds of 100% are granted only if student withdraws by the end of the first day of the semester. There is no refund for the late fee.

Partial refunds approved for payment are based upon percentage of the fees paid. The following schedule applies to both full-time and part-time students.

SEMESTER WITHDRAWALS	
1st and 2nd weeks	90% refund
3rd and 4th weeks	50% refund
5th through 8th week	25% refund
After 8th week	0% refund

For refund purposes, a "week" is defined as each five consecutive days university classes are in session.

Policy Related to Returned Checks

It is the student's responsibility to assure funds are available at his/her bank when a check is presented for payment. If a check is returned for insufficient funds, the student will be notified the check is uncollectible. He or she will then be required to pay the original amount plus a \$25 late-registration fee and a \$10 penalty for handling the uncollectible check. Payments made in redeeming an uncollectible check and paying the related late fee and penalty must be by certified check or money order within 10 days of notification or the student will not be permitted to attend classes.

Graduate Student Support Services

Graduate Assistantships

Each year a limited number of graduate assistantships are awarded to individuals with regular full-admission status to a graduate program. Graduate assistants work 10 or 20 hours a week in assignments related to academic programs or university-wide service. They are paid an hourly stipend and receive a tuition waiver for up to 15 credits a semester. There are no summer assistantships.

Recipients of a graduate assistantship must take at least 6 credits a semester, perform assigned duties in a satisfactory manner, and remain in good academic standing.

Students wishing to apply for a graduate assistantship should contact the College of Graduate Studies or their individual departments.

Financial Aid

In addition to graduate assistantships, the following financial aid may be available to graduate students.

Loans

FEDERAL PERKINS LOAN PROGRAM—To be eligible for consideration for this 5% loan, a student must complete an application form, have a current FAFSA form on file in the Office of Financial Aid, be a citizen of the United States or have declared his or her intention to obtain citizenship, and be enrolled or accepted for enrollment as a student.

These loans, which are non-interest bearing while a student is enrolled, are available to a maximum of \$2,000 each year.

FEDERAL STAFFORD LOAN PROGRAM—Loans with a cap of 8.25% interest are generally available from local banks and savings and loans associations. Loans are for a maximum of \$8,500 per academic year, with an overall limit of \$65,000 for graduate and undergraduate loans. Loans are based on need, which must be demonstrated through an approved need analysis system. Our approved form is the FAFSA application.

Veterans

Clarion University is approved to offer training under the various GI bills. Students who are entitled under one of these bills should contact the veterans counselor immediately after being accepted for admission to the university in order to secure additional instruction. This procedure is necessary so veterans may be included on the monthly payroll. The university veterans counselor is located in the Office of Financial Aid, 104 Egbert Hall, 814-226-2315.

University Libraries

The university libraries, comprised of Carlson Library on the Clarion Campus and Suhr Library on the Venango Campus, offer graduate students a broad collection of resources and services to support coursework and research. In addition to over 350,000 print volumes, the university libraries provide electronic indexing and full-text access to thousands of periodicals, newspapers, and reference sources in a range of subject areas. Interlibrary loan service further enables users to expand their research, and library instruction sessions are scheduled each term to help students become adept at finding and using information.

Computing Services

The George R. Lewis Center for Computing Services, located on the ground floor of Still Hall, is the site of Clarion University's central computing system which utilizes a Digital Equipment Corporation VMS cluster consisting of two model 6460 CPUs plus two Alpha 4100s and two Alpha 2100s. Telephone registration is handled by a Touchnet communication system. Computing Services supports 12 general student access labs located in various buildings across the Clarion and Venango Campuses.

All students have access to Internet, e-mail and the capability to create their own web pages. Academic services for instruction and research include the following computer languages and packages: COBOL, FORTRAN, BASIC, PASCAL, TSP, SAS, ADA, C, C++, SPSS, and business simulations.

Student Health Service

The Keeling Health Center provides health services and wellness promotion to the student community of Clarion University. The health center is located at the northwest corner of the campus near Givan Hall. A highly credentialed staff, including contracted physicians, a certified registered nurse practitioner, and registered nurses certified in college health provide specialized student health services. Operating hours are announced at the beginning of each semester and designed to accommodate the needs of the student population. After-hour and emergency services are available from a variety of community providers.

Health issues are approached holistically, taking into consideration individual physical, spiritual, environmental, social, intellectual, occupational, and emotional issues. Specific services available through the health center include: physical examinations, immunizations, allergy injections, medication, pregnancy testing, treatment of minor illnesses and injuries, education, and referral to appropriate community resources. Specific service offerings are evaluated on an ongoing basis.

An auxiliary support fee assessed at the beginning of each semester provides for an unlimited number of visits to the health center. There may be additional charges for any medications or procedures associated with the visit. Students are strongly encouraged to contact their primary insurance carrier to determine the conditions and limitations, if any, on medical treatment away from home.

Student Health Insurance

The health center fee which students are assessed applies only to treatment and services at Keeling Health Center. Diagnosis, treatment, services, or facilities not available at the health center, but required due to an illness or accident, are the financial responsibility of the student. These would include, but are not limited to, X-rays, ambulance, emergency room treatment, setting and casting breaks, and hospitalizations. Without insurance, the cost involved could jeopardize a student's ability to continue his or her education. Therefore, if the students are not covered by parental or their own medical insurance, we strongly urge such coverage be secured. In addition, university policy requires students have medical insurance coverage to be eligible for participation in university sanctioned, sponsored, and/or approved activities. The assumption is that when students participate in such activities they are covered by medical insurance and proof of coverage can be produced upon the university's request.

An accident and sickness insurance plan is available to all Clarion University students. For further information on this plan, contact the Student Affairs Office, 222 Egbert Hall, Clarion University, Clarion, PA 16214-1232, telephone 814-226-2351.

Due to the high cost of health care in the United States, it is for the benefit of all international students that they are **required** to have some type of health insurance coverage. If you do not already have some type of coverage when you arrive at Clarion, you must enroll in a plan immediately. The Office of International Programs has information on several comprehensive insurance plans. For further information on insurance, please contact the Office of International Programs.

Housing

Limited housing for graduate students is available in the university-supervised residence halls. For information, students should contact the Office of Residence Life, 228 Egbert Hall, telephone 814-226-2352.

Any arrangements for housing in the community is a business relationship between a student and the householder. The Office of Residence Life maintains a limited listing of available housing in the community, but the university does not approve or make recommendations related to private off-campus housing accommodations.

Parking and Automobile Regulations

All provisions of the Vehicle Code of the Commonwealth of Pennsylvania as supplemented by parking regulations issued by the chancellor, State System of Higher Education, and Clarion University, will be strictly enforced on the Clarion University Campus. Authority for such enforcement rests with the director of public safety. Individuals who fail to pay fines will be reported to the district magistrate, and upon conviction will be subject to penalties provided by law.

Everyone who possesses, maintains, or operates a motor vehicle on campus (between 7:30 a.m. and 4:30 p.m.) is required to register such vehicle with the Department of Public Safety. Registering a vehicle does not guarantee a parking space.

1. Individuals qualifying for campus parking privileges will be issued a tag indicating this privilege has been granted and will be assigned to a specific parking area.
2. Any person who intends to operate a vehicle on campus after the date on which permits are required must register the vehicle immediately with the Office of the Director of Public Safety. Motor vehicles must be registered even when their use is intermittent rather than regular.

Career Services

The Office of Career Services is a centralized career development office serving all Clarion University students and alumni. Individual assistance, programs, and resources are provided to help students: (1) make informed career and educational decisions, (2) prepare for the job search, and (3) begin the transition from campus to career.

Since career planning is a continuous process, students are encouraged to make Career Services an integral part of their entire university experience. The services are designed to educate and guide students through the career planning process: discovering abilities and interests, exploring educational and career options, making decisions, planning activities to progress toward desired goals, implementing a job search, or applying to additional graduate programs.

For those initiating a job search, Career Services provides on-campus recruiting by employers; individual counseling for students with job search concerns; a career library of employer and graduate school information; technology for developing job search materials; the “Careerline” newsletter; job search workshops; an individualized resumé service; a mock interview program; job fairs; job bulletins; and a job hotline.

Information on the post-graduation activities of Clarion’s graduates is available upon request from the Office of Career Services.

Master of Science Degree in Biology

College of Arts and Sciences

Graduate Faculty

Professors: W. Barnes, W. Belzer, P. Dalby, K. Eggleton, R. McPherson, T. Morrow, M. Ritter, E. Zielinski; **Associate Professors:** L. Bering, S. Harris, D. Smith, C. Williams; **Assistant Professors:** W. Jetkiewicz, A. Turner

Program Objectives

The primary objectives of the Master of Science program in biology are to:

- Prepare professional biologists.
- Prepare individuals for leadership roles in environmental, educational, and laboratory-oriented science.
- Prepare biologists for research-oriented careers.
- Prepare individuals for further graduate work.

A candidate for the Master of Science program in biology may concentrate in one of several areas of emphasis including: physiology, ecology, behavior, genetics, microbiology, immunology, molecular biology, and systematics.

Definition of Terms

Departmental Graduate Committee—Committee which reviews all applications for admission to the M.S. in Biology Program and makes recommendations to the department concerning admission of students and the existence of deficiencies.

Graduate Program Coordinator—A designated advisor in the Department of Biology who meets all new graduate students and assists them in planning their first semester program of courses and/or recommends them to major advisors when desirable.

Major Advisor—A member of the graduate faculty who accepts a student for counseling and advisement during his or her course work and research and in the presentation and defense of his or her thesis.

Graduate Research Committee—A committee of at least three members selected from the graduate faculty to aid the student in determining a course of study and to prepare, administer, and grade the student's comprehensive exam and thesis. The student's major advisor will chair this committee.

Admission Requirements

College of Graduate Studies admission requirements apply with the following addition:

- Applicants must submit the Department of Biology's preliminary application form and Graduate Record Exam (GRE) general test scores.

Full-admission status will be granted to applicants who have a bachelor's degree in biology and a 2.75 overall quality-point average (QPA) on a 4.0 scale. Applicants are expected to have completed the equivalent of the Clarion University undergraduate biol-

ogy requirements in chemistry, mathematics, and physics, as well as one year of general biology, and one semester each of cell biology, genetics, and ecology. Any deficiencies will be noted in the acceptance letter, and the student will be required to remove them by exam or by taking the course(s) as soon as possible. Under exceptional circumstances course deficiencies may be waived.

Provisional admission status may be granted to applicants who have an overall QPA less than 2.75 and/or a bachelor's degree in a major other than biology. An applicant admitted to provisional status may be admitted to full status after completing nine semester hours of graduate study with an A or B grade in each course and removal of all deficiencies.

Admission is also contingent on the student identifying a biology faculty member who agrees to serve as his/her major advisor. It is strongly recommended students visit the campus and interview with potential advisors early in the application process.

Degree Requirements

To fulfill degree requirements for graduation, the student must:

- Remove all academic deficiencies in a manner acceptable to the Department of Biology as recommended by the student's major advisor and graduate research committee.
- Complete a minimum of 30 semester hours, including 24 hours in required courses with a minimum QPA of 3.0/4.0, and a minimum of six hours of Biology 700. Students must take two Biology 500 Seminar courses, one of which must be in a subject area outside their research emphasis. Seminar courses are included in the minimum course hour total.
- Pass a written comprehensive examination after completing 18 credits with a cumulative QPA of not less than 3.0. At least three subject areas in biology and/or disciplines relevant to the student's course of study, chosen in agreement by the major advisor, graduate research committee, and the student, must be included in the comprehensive examination. A student who fails the comprehensive examination may retake it once by agreement with the major advisor and graduate research committee. Failure of the comprehensive examination for a second time will result in dismissal from the graduate program.
- Conduct an original independent study and submit a written thesis. A written prospectus of the research must be approved by the candidate's graduate committee before research is initiated, usually at or before the close of the second semester in residence. When a preliminary draft of the thesis is judged by the major advisor to be suitable, the candidate will provide each member of his or her committee with a copy of the preliminary draft. The date of the oral thesis defense must be announced to the general college faculty at least two weeks prior to the defense. The defense will be conducted by the graduate research committee, which will report its approval or disapproval along with recommended revisions. At least five copies of the final draft of the thesis shall be prepared by the student, who will deliver them to the major advisor who will obtain the appropriate signatures and deliver the copies to the Office of Graduate Studies. A binding fee will be charged to the student by the Office of Graduate Studies.

Only 400-, 500-, 600-, and 700-level courses can be taken for graduate credit. No more than six semester hours of approved 400-level courses taken for graduate credit may count toward the master's degree (see below).

Placement

A great need for good professional biologists exists at the present, and should continue into the foreseeable future. Projections by both industry and federal government sources indicate that the need for life scientists and health workers should increase. The need for individuals with additional or more specialized training than required for a B.A. or B.S. degree is increasing. Placement of past graduates of the program has been excellent in teaching and research; federal, state, and local government; private industry; medical technology; dentistry; optometry; and doctoral and specialist programs.

Graduate Assistantships

A limited number of graduate assistantships and/or research assistantships are available. Departmental graduate assistants are assigned to assist in laboratory supervision in the undergraduate program in biology. Research assistants generally work on a grant-funded project directed by a faculty member. Graduate assistants must have full-admission status.

All applicants for graduate assistantships must first complete the regular admission procedure and submit the application for a graduate assistantship to the Department of Biology. Applicants for graduate teaching assistantships must request their referees include in their three letters of recommendation a statement concerning the student's potential as a laboratory assistant.

All new applicants for graduate assistantships will be required to complete an interview prior to appointment. Graduate assistantships are usually renewable for two years if the student has made reasonable progress toward the degree (see below).

New applicants for graduate assistantships must submit completed applications no later than April 15; appointments are usually made by May 1 of each year. Continuing students must submit an assistantship application packet by April 1.

Advisement

Before course work begins, the admitted student should meet with the graduate program coordinator or assigned major advisor for orientation and assistance in planning the first semester program. The student should initiate the selection of a major advisor and a graduate committee during the first semester at Clarion. The student and the graduate committee shall develop an academic research program leading to the M.S. degree. The student will be responsible for scheduling a Graduate Committee meeting once per semester to evaluate progress toward the completion of the program. Minutes of the graduate meetings will be recorded by the major advisor and will become a part of the student's permanent file.

A minimum of nine credits per semester is considered a full load for graduate students. Twelve semester hours (three credits per session) is a maximum load during summer sessions. Exceptions may be authorized by the dean of the College of Graduate Studies upon recommendation by the Department of Biology acting upon a written petition by the student.

It is the candidate's responsibility to file, with the aid of his or her major advisor, an Application for Graduation prior to the published deadline during the semester in which he or she intends to graduate.

Courses

Courses may be taken from any curriculum in the *Graduate Catalog*. Students are encouraged to go outside the Department of Biology for courses if their program goals and career interests will benefit as determined by their graduate research committee.

While students can, and frequently do, take undergraduate courses at all levels of instruction, only 400-, 500-, 600-, and 700-level courses can be taken for graduate credit. No more than six semester hours of 400-level courses may count toward the master's degree. The 400-level courses which may count toward the master's degree are BIOL 460, 461, 464, 470, 471, CHEM 453, 463, GEOG/ES 400, 425, 470, and 490.

Reasonable Progress Toward Degree

It is the expectation of the Biology Department that the first priority of all full-time graduate students is the completion of the requirements of the master of science degree in a timely manner. Reasonable progress toward completion of the degree will be determined by the student's major advisor and graduate research committee. At a minimum, reasonable progress will include: (1) submission and tentative approval of the research prospectus by the student's major advisor and graduate research committee by the end of the second semester in residence; (2) maintaining a minimum QPA of 3.0 in all course work attempted; (3) holding graduate research committee meetings once per semester; and (4) attempting the comprehensive examination after completing 18 semester hours. Students who are applying for a second year of support as a departmental graduate assistant must submit evidence of relevant degree progress to the departmental graduate committee that includes documentation of the criteria listed above in addition to evidence that professional duties associated with the current year's assistantship have been completed in a satisfactory manner.

Physical Facilities

The Department of Biology is located in the Peirce Science Center, a four-story teaching and research building. This facility is well supplied with sophisticated equipment and instrumentation necessary for studying the many facets of biology. In addition, the department also maintains continually expanding herbarium and vertebrate biology collections, animal and aquarium rooms, an environmental chamber room, a cell culture laboratory, and a greenhouse located adjacent to the building. Recently renovated molecular biology/biotechnology and ecology laboratories provide research support for students in these growth areas. Field work is conducted on land owned by the university adjacent to the campus or on the huge expanse of state, federal, or privately-owned land/waters in close proximity to the university. Ecologically interesting areas within a 100-mile radius of the campus include the Jennings Nature Preserve, Allegheny National Forest, Cook Forest State Park, Tionesta Scenic Area, Heart's Content Scenic Area, Presque Isle State Park, Power Mill Nature Reserve, and the Pymatuning region.

Pymatuning Laboratory of Ecology

Because of a unique cooperative program with the University of Pittsburgh, Clarion University is able to offer an outstanding program of studies in ecology. Courses are taken at Clarion Campus during the academic year. In the summer, an excellent academic program is offered at the Pymatuning Laboratory of Ecology, a unit of the University of Pittsburgh. Classes are taught and research is directed by members of both institutions. The laboratory is located approximately 1½ hours northwest of Clarion on the shores of the Pymatuning Reservoir.

The teaching and research facilities of the field laboratory are on a site within a wildlife sanctuary and propagation area managed by the Pennsylvania Game Commission. A hatchery of the Pennsylvania Fish Commission is adjacent to these facilities. The housing and

dining area for the laboratory is located three miles away, on the public portion of the Pymatuning Reservoir. A waterfront area is available for recreational use by students and staff.

Release of Data from M.S. Thesis—Publication Policy

Publications resulting from research done at Clarion University shall give credit to people involved in the research, to Clarion University, and to any granting agencies which supported the research.

Biology Courses

BIOL 460: COMPARATIVE VERTEBRATE ANATOMY 3 s.h.

This course traces the most important trends in the evolution of basic structures in vertebrate lines and conveys an appreciation of how the mammals came to possess the combination of characters that make this group unique. Two lectures and three laboratory hours weekly. Prerequisites: BIOL 155/156. Spring, even-numbered years.

BIOL 461: VERTEBRATE EMBRYOLOGY 3 s.h.

A descriptive study of the development of vertebrates, including early processes and the formation of organ systems. Two lectures and three laboratory hours weekly. Prerequisite: One year of biology. Spring, odd-numbered years.

BIOL 464: DEVELOPMENTAL BIOLOGY 3 s.h.

A study of the major processes in development and their underlying mechanism. Includes a descriptive study and mechanisms such as differentiation, induction, and morphogenesis. Materials deal primarily with animal development. Two lectures and three laboratory hours weekly. Prerequisites: BIOL 155/156, 201, and General Chemistry. Fall, annually.

BIOL 470: ANIMAL ECOLOGY 3 s.h.

A course dealing with the interrelationships of animals and their environment, including physical and biological factors. Discussions and investigations will include animal distribution, predator-prey interactions, competition, species diversity, energetics, population, and community organization. Field and laboratory studies included. Prerequisite: BIOL 202. Spring, even-numbered years.

BIOL 471: PLANT ECOLOGY 3 s.h.

An in-depth approach to the interaction of plants with the physical and biotic environments at population, community, ecosystem, and landscape scales. Lecture and discussion will focus on current topics in plant ecology such as disturbance, succession, herbivory, dispersal, competition, and environmental stress. Laboratory will include field-based experimental and descriptive investigations of plant populations and communities. Two hours lecture/discussion and three laboratory hours weekly. Prerequisite: BIOL 202. On demand.

BIOL 500: GRADUATE SEMINAR 1-2 s.h.

A survey of current literature, concepts, and theories from selected fields of biology. Two discussion hours weekly. By arrangement.

BIOL 502: BIOMETRY 3 s.h.

Collection, analysis, and presentation of biological data. Fundamental aspects of designing and executing descriptive and experimental studies with emphasis on biological research. Applications to undergraduate and graduate research in progress in the Department of Biology are stressed. Three lecture hours per week. Spring, alternate years.

BIOL 503: SPECIAL TOPICS IN BIOLOGY 1-4 s.h.

Semi-independent studies of topical material under the guidance of the instructor. Maximum credit allowable toward graduation: nine semester hours. Prerequisites: permission of instructor and the student's graduate committee.

BIOL 505: ECOLOGICAL APPLICATIONS 3 s.h.

A case history approach to the analysis and possible resolution of both terrestrial and aquatic environmental problems. Students will analyze the problem from a number of perspectives, including the biological, in an assessment of the problem. Sample design, cost considerations, data collection and analysis will be incorporated into the assessment. The overall assessment of the problem and possible resolution will be conveyed both orally and in a written format. This course is considered a capstone for students in the Applied Ecology Program, but is appropriate for other students who meet the prerequisites. Prerequisites: BIOL 202, or permission of the instructor. BIOL 493 and 494 are recommended. Spring, alternate years.

BIOL 520: TERRESTRIAL BOTANY 3 s.h.

A field course emphasizing the identification, distribution, and ecology of upland vascular plants of Western Pennsylvania. Field and laboratory projects will focus on plant characteristics, taxonomic relations, floristics, habitat relationship, inventory methods, and plant community description and dynamics. (Pymatuning)

- BIOL 521: AQUATIC ENTOMOLOGY** 3 s.h.
Emphasis in this course is on identification of the major groups of invertebrates playing a role in natural communities and on the methods of quantifying their relative importance in the community. (Pymatuning)
- BIOL 522: AQUATIC BOTANY** 3 s.h.
Study of freshwater algae and aquatic vascular plants in field communities, methods of quantifying relative numbers and mass, and structural and physiological adaptations to the aquatic environment. (Pymatuning)
- BIOL 523: EXPERIMENTAL VERTEBRATE ECOLOGY** 3 s.h.
Designed to give knowledge of basic field identification, capture techniques, quantification, and natural history of some of the common vertebrates of Pennsylvania. (Pymatuning)
- BIOL 524: MICROBIAL PHYSIOLOGY** 4 s.h.
A study of the physiological reaction involved in the growth, reproduction, and death of microbes. Consideration is placed upon the metabolism of carbohydrates, proteins, vitamins, and fats. Enzymes, oxidation-reduction potentials, energy relationships, membrane potentials, and nutrients are considered. Prerequisites: General Microbiology and Biochemistry or permission of instructor. Two lecture and four lab hours per week.
- BIOL 525: FISHERIES BIOLOGY** 3 s.h.
Ecology of fish populations, including identification, age and growth, populations estimation and analysis, food habits, environmental requirements, and management considerations. Prerequisites: Environmental Biology or permission of instructor. Three lecture hours per week. Laboratory sessions held on Saturdays. Student must possess a valid Pennsylvania fishing license.
- BIOL 526: FIELD ICHTHYOLOGY** 3 s.h.
A field course dealing with the interrelationships of fish with their biotic and abiotic environment. Fish in their natural habitats, pollution, and improvements of aquatic habitats, and applied aspects of fish ecology and fishery management will be studied. (Pymatuning). Student must possess a valid Pennsylvania fishing license.
- BIOL 527: PLANT TAXONOMY AND FIELD BOTANY** 3 s.h.
A field-based course emphasizing the identification, classification, distribution, and evolutionary relationships of vascular plants with particular emphasis on the flora of Western Pennsylvania and adjacent regions. Two lecture and three laboratory or field work hours weekly. Prerequisite: BIOL 155/156; BIOL 202 is highly recommended. Fall, odd-numbered years.
- BIOL 543: VIROLOGY** 3 s.h.
A study of plant, animal, and bacterial viruses, including the biochemistry of viruses and viral life cycles, techniques in the study of viruses in relation to diseases, tumors, and cancer. Prerequisites: Microbiology or Biochemistry or permission of instructor. Three lecture hours per week.
- BIOL 544: IMMUNOLOGY** 4 s.h.
A study of cellular immunology, immunochemistry, and immunogenetics, with emphasis on the physiology of immune responses. Prerequisite: Permission of instructor. Three lecture and three lab hours per week.
- BIOL 546: PATHOGENIC MICROBIOLOGY** 4 s.h.
A study of the bacteria, fungi, and viruses which cause human disease. Laboratory emphasis is on isolation and identification of pathogens and on elementary immunology. Two lectures and four laboratory hours weekly. Prerequisites: BIOL 341. Spring, annually.
- BIOL 550: CELL PHYSIOLOGY** 4 s.h.
The study of the molecular dynamics of eukaryotic cells. The material deals specifically with eukaryotic cells. Major topics include functional and structural organization of the cell, molecular regulation of cell function, and the cell as a biochemical transducer. Graduate students taking the course must complete an assigned class project. Two lecture sessions and four laboratory hours per week. Prerequisites: Completion of BIOL 155/156, 201, 203, and CHEM 254 or permission of the instructor.
- BIOL 551: ADVANCED ANIMAL PHYSIOLOGY** 1-3 s.h.
A detailed treatment of fundamental concepts and techniques of animal physiology. Includes literature reviews and individual investigations. Two lecture and three lab hours per week.
- BIOL 552: ADVANCED PLANT PHYSIOLOGY** 3 s.h.
Life processes and responses of plants to the environment. Topics include water relations, transpiration, translocation, photosynthesis, respiration, metabolism, plant hormones and morphogenesis, photoperiodism, temperature responses, environmental and stress physiology. Two lecture and three lab hours weekly. Prerequisites: BIOL 201, 203, and CHEM 254. Spring, odd-numbered years.
- BIOL 555: ENDOCRINOLOGY** 3 s.h.
A survey of the chemical and physiological principles of hormonal integrations in animals. Three lecture hours per week.

- BIOL 556: ENTOMOLOGY 3 s.h.**
A general study of insects, including structure, physiology, classification, economic importance, and relationships. Two lecture and three laboratory or field work hours weekly. Fall, odd-numbered years.
- BIOL 563: BEHAVIORAL ECOLOGY 3 s.h.**
An examination of the behavior of animals in relation to their natural environment with emphasis on the functioning of patterns of behavior in nature, intraspecific communication and social organization, behavioral relationships between species, and the regulation of behavior by the environment. (Pymatuning)
- BIOL 571: HABITAT ECOLOGY-AQUATIC 6 s.h.**
A detailed examination is made of the structure and functioning of selected aquatic ecosystems. Emphasis is placed on the interrelationships of functioning systems. (3 credits at Pymatuning)
- BIOL 572: TERRESTRIAL COMMUNITY ECOLOGY 6 s.h.**
A study of the composition, distribution, and dynamics of plants and animals in selected terrestrial communities. Major biomes to be included will be grassland, deciduous forest, coniferous forest, and tundra. Summers only: six weeks. (3 credits at Pymatuning)
- BIOL 573: FRESHWATER ECOLOGY 3 s.h.**
A field-oriented study of the physics, chemistry, and biology of standing and flowing inland waters.
- BIOL 574: ECOLOGY OF AQUATIC INSECTS 3 s.h.**
Examination of the ecological adaptations of aquatic insects with special emphasis on morphology, habitat, and trophic relationships. (Pymatuning)
- BIOL 575: EXPERIMENTAL ECOLOGY 3 s.h.**
Study of designs suitable for investigation of natural populations and communities stressing statistical analysis, and the logical control of experiments in natural situations. (Pymatuning)
- BIOL 576: FUNGAL ECOLOGY 3 s.h.**
Emphasis will be on the role of fungi in the decomposition of organic materials in terrestrial and aquatic communities, and the recycling of mineral nutrients. (Pymatuning)
- BIOL 577: FOREST ECOLOGY 3 s.h.**
Study of the composition, methods of analysis, development, and manipulation of forests in the United States. Emphasis is placed on methods of studying forest composition and development. (Pymatuning)
- BIOL 578: BIOME STUDIES 3 s.h.**
A travel-study program which offers opportunities for study in the various biomes, e.g., grasslands, montane, seashore, etc. Summers only. Prerequisites: Environmental Biology or permission of instructor.
- BIOL 579: ALPINE ECOLOGY 3 s.h.**
Students travel to the Beartooth Mountains in northern Wyoming where they may undertake field studies of aquatic and terrestrial communities along an altitudinal transect. Permission to register granted on an individual basis. (Students will share cost of travel and food. Tents and cooking facilities will be provided.) (Pymatuning)
- BIOL 581: MICROBIAL GENETICS 3 s.h.**
A study of bacterial and viral genetics with emphasis upon mutation, mutant selection, gene action, recombination genetic mapping, gene regulation, and recombinant DNA technology. Laboratory sessions are on an arranged basis. Prerequisite: permission of instructor. Two lecture and three lab hours per week.
- BIOL 583: MOLECULAR BIOLOGY 4 s.h.**
The study of the structural and functional relationships of the major biological macro-molecules, with emphasis on nucleic acid biology. Current systems, methods, and applications of biotechnology, including recombinant DNA techniques, will be emphasized in the laboratory. Two lectures and three laboratory hours weekly. Spring, annually.
- BIOL 585: BIOTECHNOLOGY 4 s.h.**
Advanced topics in the current systems, methods, and applications of recombinant DNA and protein biotechnology. Three lecture/discussion and three lab hours each week. Prerequisite: BIOL 483/583 or consent of instructor. Spring, annually.
- BIOL 591: BIOGEOGRAPHY 3 s.h.**
The subject matter covers aspects of the distribution of plants and animals. Main topics of concern include interpretive approaches to biogeography, paleobiogeographic evidence of past distributions, the centers of origin of various groups, mechanisms and routes of dispersal and colonization, and the dynamics of extinction. Prerequisites: BIOL 202 and 203.

BIOL 592: ANIMAL BEHAVIOR 3 s.h.
A study of the biological concepts of animal behavior. An investigation of topics such as sensory receptors, internal mechanisms, genetics, learning and habituation, social organization, and communication. Laboratory exercises involve techniques of observation and experiments in animal behavior. Two lecture and three lab or field work hours per week. Prerequisites: completion of courses in principles of ecology and genetics or permission of instructor. Fall, alternate years.

BIOL 593: COMMUNITY AND ECOSYSTEM DYNAMICS 4 s.h.
An in-depth approach to the structure, function, and dynamics of ecological systems at community, ecosystem, and landscape scales. Lecture and discussion will focus on current topics such as niche theory, the regulation of community structure, food webs, ecological stability, diversity, succession, and energy and material cycles. Laboratory will emphasize field-based descriptive and investigative studies of local communities and ecosystems. Three lecture and three lab hours weekly. Prerequisites: BIOL 202 or equivalent is required. A basic statistics course is highly desirable. Fall, even-numbered years.

BIOL 594: POPULATION BIOLOGY 4 s.h.
This course deals with the empirical, experimental, and theoretical aspects of the structure, growth, and evolution of biological populations. The course will take a holistic approach to how population genetics and population ecology interact to produce observed population structure and dynamics. Three hours lecture/discussion and three lab hours weekly. Prerequisites: BIOL 202, MATH 260, or permission of the instructor. Spring, odd-numbered years.

BIOL 600: SPECIAL PROBLEMS IN BIOLOGY 1-3 s.h.
By permission.

BIOL 700: RESEARCH AND THESIS minimum of 6 s.h.

Master of Business Administration

College of Business Administration

Graduate Faculty

Professors: R. Balough, W. Campbell, S. Chen, J. Eicher, S. Ewedemi, L. Felicetti, W. Fulmer, B. Garland, J. Grunewald, P. Kim, T. Oliver, J. Pesek, C. Pinenò, A. Que, J. Reed, W. Sanders, S. Sohng, W. Stine, T. Stuhldreher, K. Traynor, M. VanLandingham, T. Wilson, C. Yang, W. Yeane; **Associate Professors:** C. Anderson, J. Eichlin, C. Farinacci, M. Haggerty, T. Johns, L. Quesenberry, K. Roth, L. Smith, **Assistant Professor:** G. Bish

Program Objectives

The major objective is to provide a basic core of knowledge about various theories, techniques, and practices of administering business activities and problem solving. In addition, candidates for the degree have an opportunity for in-depth study in a particular area of interest. Specific objectives are to prepare candidates for:

- positions in middle management with private and public organizations;
- teaching positions in community colleges;
- enrollment in doctoral programs in business administration.

The program is designed for candidates with undergraduate degrees in fields other than business administration as well as graduates of business degree programs. Graduate courses are offered in the evening to facilitate attendance of employed or part-time students.

Admission Requirements

College of Graduate Studies admission requirements apply with the following additions:

- Students must submit official scores on the Graduate Management Admissions Test (GMAT).
- Applicants currently employed should include references from both professors and/or employers among the three letters of reference.

Course Requirements for Graduates

A. Foundation Courses

At least 39 credit hours of undergraduate courses or their equivalents must be completed with a grade of “C” or better to meet the undergraduate “common body of knowledge” that makes up the foundation courses requisite for the M.B.A. degree. Foundation requirements may be satisfied by course work at Clarion or other approved institutions. They may also be satisfied by the Advanced Placement—Credit By Exam option (refer to *Undergraduate Catalog*). Foundation requirements must be completed within the first 15 hours of graduate work. The following are the foundation courses:

ECON 212 or 310: Microeconomics*
ECON 211 or 311: Macroeconomics*
CIS 110: Computer Information Processing
ACTG 251: Financial Accounting
ACTG 252: Managerial Accounting
ECON 221: Economic and Business Statistics I
ECON 222: Economic and Business Statistics II
BSAD 240: Legal Environment I

MGMT 320: Management Theory and Practice
MKTG 360: Principles of Marketing
FIN 370: Financial Management
MATH 232: Calculus for Business
MGMT 425: Production Management

*Entering students who are deficient in the economics area of the common body of knowledge are strongly recommended to take the intermediate sequence in lieu of principles.

B. Core Courses

The following courses (24 semester hours) are required of all M.B.A. candidates:

ACTG 552: Management Accounting
ECON 510: Advanced Managerial Economics
ECON 603: Quantitative Analysis for Business Decisions
FIN 570: Managerial Finance
MKTG 560: Marketing Decision Making
MGMT 521: Organization Structure and Behavior
MGMT 626: Production/Operations Management
BSAD 690: Administration and Business Policy

Students may petition to substitute another graduate-level course for a core course. Students who have majored in the discipline covered by the M.B.A. core course may be required to substitute another graduate-level course. The criteria are that: (a) the student has taken at least 15 credits in that field and (b) the student possesses the knowledge to be gained in the core course. Course substitution requires the recommendation of the M.B.A. director in counsel with the department chair in question. Evidence such as competency testing may be required, especially for the use of non-business courses.

C. Electives

In addition to the M.B.A. core, all students will complete the balance of 33 credits of graduate course work from the following courses, subject to the offering of those courses. Graduate-level courses, other than those listed, may be used as elective credit toward the M.B.A. degree with prior approval of the M.B.A. director and the dean of the college.

ACTG 451, 452, 453, 454, 455, 461, 463, 490, 499, 554, 650, 652, 653
CIS 402, 403, 462
BSAD 601, 637, 699
ECON 410, 423, 461, 470, 490, 570, 600, 611, 612, 699
FIN 471, 476, 480, 671, 676
MGMT 420, 423, 483, 485, 486, 621, 622, 625, 650
MKTG 460, 461, 465, 468, 562, 604, 661

A maximum of three hours of approved 400-level courses, taken for graduate credit, may be used as electives. A maximum of nine graduate credit hours toward the 33 required for the M.B.A. may be transferred from accredited graduate programs with the approval of the M.B.A. program director and the department chair of the course for which transfer credit is sought. No graduate credit is granted for correspondence courses.

All students will be expected to complete the computer foundation course in the first semester at Clarion. Students with this foundation, but from schools other than Clarion, will be expected to attend a workshop during the first semester that introduces them to the Clarion computing facilities. Fundamental computer literacy will be assumed in graduate course work.

Performance Requirements

Students who earn more than six hours of graduate credit at Clarion with a grade of “C” or earn any credits with grades below “C” and/or fall below a 3.00/4.00 graduate overall

quality-point average (QPA) are automatically placed on probation. Students whose QPA in the foundation courses falls below a 3.00/4.00 are also placed on probation. Students placed on probation must achieve satisfactory academic standing within one semester of registration or be removed from the program. All prerequisite (undergraduate) courses for a given course must be completed prior to taking that course.

MGMT 521 and ECON 603 must be taken before completing 12 hours of graduate course work, and BSAD 690 must be taken during the last semester of graduate course work. ECON 603 and ECON 510 are prerequisites for MGMT 626. The maximum time for completion of the degree program is six calendar years from the date of first enrollment.

Specialized Options

Students pursuing the M.B.A. degree may enroll in the PROFESSIONAL ACCOUNTANCY COURSE OF STUDY. Clarion University undergraduate students may also apply for this course of study, and upon completion will receive both the Bachelor of Science in Business Administration and the Master of Business Administration degrees. Only students whose career aspirations require the highest discipline in accounting expertise are advised to apply for this course of study. The sequence of 164 total semester hours of course work, including 36 s.h. of graduate course work, is designed to prepare students for entry into the practice of professional accountancy as prescribed by the American Institute of Certified Public Accountants. Entrance into the Professional Accountancy course of study will normally occur upon admission to the M.B.A. Program or, for undergraduates, during the student's junior year upon formal approval of the Department of Accountancy chair. Entrance into this program for undergraduate students does not ensure admission into the M.B.A. program upon completion of the bachelor's degree. Interested students should contact the Department of Accountancy chair for details and options.

The College of Business Administration, in conjunction with the College of Arts and Sciences, offers a LIBERAL ARTS PRE-PROFESSIONAL MBA OPTION. Undergraduate foundation course requirements in business administration may be taken concurrently with a liberal arts major, giving students many of the courses prerequisite to the M.B.A. Program prior to graduation. Undergraduates interested in this program should contact their liberal arts advisor for details and requirements.

Students wishing to pursue the PROFESSIONAL ACCOUNTANCY or the LIBERAL ARTS PRE-PROFESSIONAL options must follow the normal M.B.A. admission procedures. Admission to one of these options does not guarantee admission to, nor completion of, the M.B.A. degree.

Placement

Graduate students are encouraged to use the services of the University Career Services Office. Graduates often obtain positions with banks, manufacturing concerns, accounting firms, other business and industrial organizations, hospitals, and government agencies.

Graduate Assistantships

Graduate assistantships are available to qualified M.B.A. students. Awarded competitively, they cover some or all basic tuition expenses and provide a stipend. They also may furnish additional opportunity for close work with graduate faculty on a variety of research projects. Applications for assistantships are available in the M.B.A. Office.

Advisement

All graduate students are assigned an advisor upon admission. Students must obtain the signature of their advisor when registering for courses, changing schedules, on any special requests for course substitutions, independent study, individualized instruction, internship, or special problems courses.

Physical Facilities

The College of Business Administration is housed in Dana S. Still Hall. This modern facility contains its own microcomputer lab with about 30 personal computers and eight VAX terminals providing access to the university's DEC VAX systems and Internet, as well as a local network for PC applications. Graduate student offices in Still Hall are also PC equipped with access to the mainframe computers.

There is a Reading Center for business students in Still Hall, and the university library is located one block away.

Accounting Courses

ACTG 451: ACCOUNTING PROBLEMS 3 s.h.

A problem-oriented study of topics most often tested on the CPA exam. Included are inventory methods, long-term contracts, partnerships, leases, consignments, installment sales, receiverships, fiduciary accounting, and government accounting. Preparations for the practice portion CPA exam are emphasized. Prerequisite: ACTG 355. Spring semester.

ACTG 452: ADVANCED COST ACCOUNTING 3 s.h.

A study of advanced concepts of cost accounting as a means of providing useful quantitative information for decision-making. Topics include inventory valuation, cost allocations, joint-product and by-product costs, process costing, accounting systems, profit center costs, and segment performance measuring. Prerequisites: ACTG 352. Annually.

ACTG 453: PROBLEMS IN FEDERAL TAXATION ACCOUNTING 3 s.h.

Federal income tax concepts and compliance problems of partnerships, corporations, estates, and trusts. Also a brief consideration of the concepts of social security, estate, and gift taxation. Prerequisites: ACTG 353. Spring semester.

ACTG 454: COMPARATIVE ACCOUNTING SYSTEMS 3 s.h.

The major objective of the course is to help the student to develop a holistic approach to the concepts and practices for the examination and exploration of accounting systems. Specialized accounting systems will be discussed in detail dependent upon the interest and desires of students. Prerequisites: ACTG 251, 252, 350, 351, 354, CIS 223 and 301. Annually.

ACTG 455: NOT FOR PROFIT ENTITIES 3 s.h.

A study of the principles and practices of budgeting and accounting for activities of entities that are operated for purposes other than making profits. Prerequisite: ACTG 351. Annually.

ACTG 461: INTERNATIONAL ACCOUNTING 3 s.h.

A study of the influence of cultural values on the practice and theory of accounting and developing sensitivity to the differences and similarities of different accounting systems. Other international topics include consolidation, translation of foreign currency statements, inflation, replacement cost accounting of global oriented corporations, and harmonization of accounting standards. Prerequisites: ACTG 252. Each semester.

ACTG 463: TAX PLANNING 3 s.h.

A survey course to acquaint the student with tax-planning techniques which can be used to accomplish an individual's financial goals. An understanding of financial position, cash flow and income, gift and estate tax matters enables the student to suggest actions that fit the individual's financial priorities. Prerequisite: ACTG 353. Annually.

ACTG 490: CURRENT ACCOUNTING PRONOUNCEMENTS AND PRACTICE 3 s.h.

A research study of current Financial Accounting Standards Board statements of standards, interpretations, concepts, exposure drafts, and discussion memorandums. The internship experience and related research topics will be presented, discussed, and integrated with the pronouncements. Prerequisite: COOP 420: Accounting Internship. Spring Semester.

- ACTG 499: SPECIAL TOPICS IN ACCOUNTING** 3 s.h.
 Various current topics affecting accounting practice and theory will be presented. Different topics will be covered from year to year as subjects of importance are identified. Prerequisite: ACTG 351 or consent of the instructor. On demand.
- ACTG 522: MANAGEMENT ACCOUNTING** 3 s.h.
 A graduate course for non-accounting majors which deals with the application of concepts and tools of accounting analysis necessary for planning, control, and decision-making functions of national and multinational organizations. Topics include financial statement analysis and interpretation, budgeting, standards, and forecasting. Prerequisites: ACTG 251 and ACTG 252.
- ACTG 554: ADVANCED AUDITING** 3 s.h.
 An advanced study of current topics in auditing. The course is intended to develop more complex issues than those encountered in an introductory auditing course. Topics include current audit influences, special problems with audit reports, SEC practice, computer auditing, and related topics. Prerequisite: ACTG 354 (or its equivalent).
- ACTG 650: THEORY OF ACCOUNTS** 3 s.h.
 A study of past and contemporary accounting theories. The course is concerned with the historical development of accounting and its evolution to present times. Present-day accounting concepts are critically examined from the standpoint of how well they serve the needs of those who use the products of accounting. Prerequisite: ACTG 351 (or its equivalent) or permission of the instructor.
- ACTG 652: ADVANCED COST AND MANAGERIAL ACCOUNTING** 3 s.h.
 A study of complex problems in cost accounting. Use of cost accounting as a tool for managerial control is emphasized. Prerequisite: ACTG 352 (or its equivalent) or permission of the instructor.
- ACTG 653: FEDERAL TAX RESEARCH AND PRACTICE** 3 s.h.
 A study of federal tax law emphasizing the underlying philosophy of the law. Research procedures and techniques in the handling of complicated problems in tax practice and tax planning will be set forth. Prerequisite: ACTG 453 (or its equivalent) or permission of the instructor.

Business Administration Courses

- BSAD 601: INFORMATION SYSTEMS ANALYSIS** 3 s.h.
 A study of various types of information systems, with the primary focus being on computer-based systems for business organizations. Emphasis is on the development, management, and appraisal of information systems.
- BSAD 637: MULTINATIONAL BUSINESS SEMINAR** 3-6 s.h.
 This course incorporates an established program involving a consortium of American universities called the "International Business Seminar." The program involves a variety of trips to different nations for meetings with top-level executives of various organizations. The program is supplemented with a series of meetings with the instructors both prior to and after returning from the trips. Individual assignments are made, and a text which includes topical materials is provided. The assignments are of a graduate-level caliber, and are expected to produce presentable and/or publishable papers. Participation in seminars is expected to be at the graduate level. Should the student take this course for six credits, additional research will be required such that the student would be able to demonstrate graduate-level competency in one select area of international business. The area chosen will be mutually acceptable to both the instructor and the student, and the instructor will guide the student's research efforts. Prerequisite: MGMT 320 and MGMT 521.
- BSAD 690: ADMINISTRATION AND BUSINESS POLICY** 3 s.h.
 Organizational goal achievement through the interaction of administrative processes is analyzed with a concentration on technology and structure in a variety of environments. A case study approach which incorporates comparisons and contrasts between businesses of various nations. Taken last M.B.A. semester and after all foundation courses.
- BSAD 699: SPECIAL PROBLEMS** 1-3 s.h.
 (1-3 s.h. per enrollment; maximum of 6 s.h.)
 A thorough study of a business topic selected by the student from his or her area of major interest. It may take the form of research, readings, practical on-site applications, or a combination of these. Findings must be presented in a written paper which the student may be required to defend orally before a committee of graduate faculty and/or graduate students. Prerequisites: One or more graduate courses in the area from which the special project is selected, and consent of the student's advisor.

Economics Courses

- ECON 410: MANAGERIAL ECONOMICS** 3 s.h.
Use of economic analysis in the formulation of business policies. Decision theory and criteria for decision making by the firm; output and "Scale" decisions; linear programming; profits, production functions, and cost functions; competitive equilibrium (industry and firm); demand theory pricing policies, capital budgeting, and investment; uncertainty; inventory management. Prerequisites: ECON 222, 310, and ACTG 252. On demand. Note: Cannot be taken for credit after the completion of ECON 510.
- ECON 423: STATISTICAL TOOLS FOR QUANTITATIVE ANALYSIS** 3 s.h.
Application of the statistical methods of probability, sampling, estimation, analysis of variance, regression, and correlation in the areas of economics and business. Prerequisites: ECON 222. Spring, biennially. Note: Cannot be taken for credit after the completion of ECON 603.
- ECON 461: TECHNOLOGY TRANSFER AND MULTINATIONAL CORPORATIONS** 3 s.h.
An applied analysis of the behavior and rationale for multinational corporations, with a special emphasis on the economics of technology transfer. Topics include: theory of the firm; foreign direct investment; intellectual property rights; market imperfections; international trade; international finance; economic development; and technology. Prerequisite: ECON 361 or permission of the instructor. Biennially.
- ECON 470: BUSINESS CYCLES AND FORECASTING** 3 s.h.
Theories of business fluctuations; applications of modern income theory to business cycles; examination of business cycle indicators and forecasting techniques. Prerequisite: ECON 211 and ECON 222. Spring, annually. Note: Cannot be taken for credit after the completion of ECON 570.
- ECON 490: HISTORY OF ECONOMIC THOUGHT** 3 s.h.
Development of economic ideas from ancient times to the present. Emphasis upon the period from Adam Smith onward. Considers the economic and political environment in which ideas emerged as well as the leading economists advancing or defending the ideas. Prerequisite: ECON 211 and 212 and senior standing. Spring, annually.
- ECON 510: ADVANCED MANAGERIAL ECONOMICS** 3 s.h.
This course will focus on the development and practical application of theoretical and quantitative techniques to business decision-making, including international applications. Optimization techniques draw on the student's knowledge of economics, mathematics, and statistics through modeling and the use of computer statistical packages. Prerequisite: Microeconomics foundation course, ECON 222, MATH 232.
- ECON 570: ECONOMIC AND BUSINESS FORECASTING** 3 s.h.
An advanced study of forecasting techniques and business conditions analysis. Topics include: economic indicator analysis, classical time series components, econometric forecasting techniques, exponential smoothing models, and ARIMA models. Emphasis is placed on model development and evaluation using prewritten computer forecasting routines. Prerequisites: ECON 222 and macroeconomics foundation course.
- ECON 600: INDEPENDENT STUDY** 3 s.h.
An opportunity for the graduate student to investigate in depth a facet of economics not covered by course offerings. The topic of study and course requirements must be approved by the Department of Economics chair, and the work must be supervised by a faculty member. Prerequisites: ECON 603, ECON 510 or ECON 611, and other requirements as deemed appropriate by the faculty supervisor.
- ECON 603: QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS** 3 s.h.
Quantitative techniques and models which can be used for solving many of the problems that arise in business, including simple and multiple regression analysis, experimental design analysis of variance, nonparametric tests, time series, decision theory, and inventory models. Opportunity is provided for students to become familiar with the use of several computer statistical software packages. Applications include domestic and international situations. Prerequisites: ECON 222, MATH 232, CIS 110.
- ECON 611: ADVANCED MICROECONOMIC ANALYSIS FOR BUSINESS DECISIONS** 3 s.h.
An advanced study of the logical and mathematical development of microeconomic theories and the application of economic models to business problems. Major areas of study include demand theory, market models, welfare economics, and general equilibrium analysis. Prerequisite: Microeconomics foundation course.
- ECON 612: ADVANCED MACROECONOMIC ANALYSIS** 3 s.h.
An advanced study and analytical development of macroeconomic theory. Major areas include national income accounts, aggregate income determination models, monetary aggregates, and macro dynamics. Prerequisite: Macroeconomics foundation course.
- ECON 699: SPECIAL TOPICS** 3 s.h.
An opportunity for students to investigate specific topics or current issues on the graduate level. Prerequisites depend on the subject to be covered.

Finance Courses

- FIN 471: FINANCIAL PROBLEMS** 3 s.h.
 This capstone course is designed to challenge students to integrate and synthesize, through case methods, their knowledge of finance. Application of theoretical underpinning will emphasize corporate finance, but some of the cases will also deal with investments and financial institutions and markets. Prerequisite: FIN 371 or instructor's permission. Spring, annually.
- FIN 476: PORTFOLIO THEORY AND MANAGEMENT** 3 s.h.
 Examination of modern portfolio theory and its application to investment strategies; study of options and futures markets; investigation of market efficiency. Prerequisite: FIN 376. Spring, annually.
- FIN 480: MULTINATIONAL FINANCIAL MANAGEMENT** 3 s.h.
 The theory and practice of financial management in multinational firms; focuses on important differences between domestic and international financial decision-making. Prerequisite: FIN 370. Annually.
- FIN 570: MANAGERIAL FINANCE** 3 s.h.
 A study of financial management approaches to evaluating complex alternatives for using available resources in both a domestic and a multinational context. Prerequisites: ACTG 252, FIN 370.
- FIN 671: FINANCIAL THEORY AND PRACTICE** 3 s.h.
 A case-study approach to the theory and practice of corporate financial issues which must be addressed by a financial manager. Emphasis will be placed on capital budgeting decisions under varying circumstances and theoretical corporate financial concerns. Prerequisite: FIN 570.
- FIN 676: INVESTMENT MANAGEMENT** 3 s.h.
 A study of the structure and management of investment portfolios. Various types of investments are examined in terms of their risk elements and the purposes they serve.

Management Courses

- MGMT 420: OPERATIONS RESEARCH** 3 s.h.
 Scientific methods which provide managers with a quantitative basis for making decisions. Emphasis is placed on both the deterministic and stochastic methods, including the transportation method, linear programming, dynamic programming, PERT, inventory control, queuing theory, and Markov analysis. Prerequisite: ECON 222. Fall, annually.
- MGMT 423: BUSINESS AND SOCIETY** 3 s.h.
 A study of concepts of, and theories about, interrelationships between business units and society in general. The concepts and theories are then employed in the analysis of complex environmental problems encountered by business managers. Prerequisite: MGMT 320.
- MGMT 483: WAGE AND SALARY ADMINISTRATION** 3 s.h.
 A study of the formation and administration of compensation systems as they relate to the changing nature of employee rewards and expectations. Emphasis will be given to job and performance evaluation, fringe benefits, and rewards for special groups. Prerequisite: MGMT 324. Spring, annually.
- MGMT 485: INDUSTRIAL RELATIONS AND PUBLIC POLICY** 3 s.h.
 An examination of industrial relations as it relates to federal, state, and local statutes and industrial policies. Specific topics covered include OSHA, EEOA, NLRA, LMRA, and LMRDA. Prerequisite: MGMT 324. Fall, annually.
- MGMT 486: OCCUPATIONAL SAFETY MANAGEMENT** 3 s.h.
 This course is designed to provide the student with information concerning management techniques, government regulations and safety, and health program development within organizational settings. Prerequisite: MGMT 320. Once every two years.
- MGMT 521: ORGANIZATION STRUCTURE AND BEHAVIOR** 3 s.h.
 A study of the ways in which organizations, groups, and/or individuals respond to managerial philosophy and practice. Included is an analysis of the influence of various environments, mores, cultures, and societies on organizations. Emphasis is placed on the functions and processes of decision-making. Prerequisites: MGMT 320.
- MGMT 621: HUMAN RESOURCES MANAGEMENT** 3 s.h.
 A study of human resources management issues and practices in business organizations. Topics covered include the analysis and design of jobs, staffing the organization, training, and development of employees, and the design and administration of compensation systems. Prerequisite: MGMT 320.

- MGMT 622: BUSINESS OPERATIONS IN A MULTI-NATIONAL ENVIRONMENT 3 s.h.**
A study of the nature, organization, and operation of multinational firms. Selected cases of foreign operations of multinational corporations are discussed and analyzed. Prerequisite: MGMT 320.
- MGMT 625: LABOR ARBITRATION/NEGOTIATION 3 s.h.**
A synthesis of industrial relations theory and practice. The union/employer relationship will be explored from the union organization drive through the continued negotiation of collective bargaining agreements, and attendant grievance arbitration procedures. Prerequisite: MGMT 320.
- MGMT 626: PRODUCTION/OPERATIONS MANAGEMENT 3 s.h.**
A synthesis of concepts and techniques which relate directly to, and enhance the management of, production systems and a life cycle approach following the production system from its inception to its termination is utilized. Prerequisites: ECON 510, ECON 603.
- MGMT 650: TOTAL QUALITY MANAGEMENT 3 s.h.**
An examination of Total Quality Management (TQM), including the philosophies and principles of Deming, Juran, and Crosby. The focus is on the management and continuous improvement of quality and productivity in manufacturing and service organizations. Topics include quality measurement, quality assurance, giving employees responsibility for quality, the team approach to quality, employee recognition, and various TQM tools and techniques. Prerequisite: MGMT 320. Annually.

Marketing Courses

- MKTG 460: SALES MANAGEMENT 3 s.h.**
Designed to cover all aspects concerned with the management of a sales force, including the selection and testing of salespeople, training, devising compensation plans and expense accounts, territories, quotas, and evaluations. Case studies and problem-solving techniques are utilized. Prerequisite: MKTG 360. Each semester.
- MKTG 461: MARKETING RESEARCH 3 s.h.**
The application of scientific and statistical methods and tools to the solution of marketing problems are studied. Prerequisites: ECON 222 and MKTG 360. Each semester.
- MKTG 465: MARKETING PROBLEMS 3 s.h.**
A consideration by the case method and/or simulation gaming method of the problems facing the producer and reseller. Prerequisites: MKTG 360, and senior standing. Each semester.
- MKTG 468: CONSUMER BEHAVIOR 3 s.h.**
The study of theories, models, recent research, and research techniques in consumer motivation and decision making. Prerequisites: MKTG 360 and PSY 211 or permission of the instructor. Each semester.
- MKTG 560: MARKETING DECISION MAKING 3 s.h.**
The analysis of marketing concepts and problems from a managerial point of view. Emphasis is placed upon planning, organizing, and controlling of marketing activities and their integration with the objectives and policies of the firm. Both domestic and multinational marketing concepts are addressed in this course. Prerequisite: MKTG 360 and ECON 222.
- MKTG 562: MARKETING INSTITUTIONS 3 s.h.**
A study of components of a vertical marketing system and of the methods for making them effective. Also included are means of evaluating alternative marketing systems and the development of international marketing channels. Prerequisite: MKTG 360.
- MKTG 604: MARKETING RESEARCH 3 s.h.**
Methods of solving marketing research problems, including library, survey, and experimental research methods; project design; data collection, analysis, and interpretation; presentation of marketing research reports for managerial user. Problems in international marketing research and research ethics are also included. Selection, design, and completion of a marketing-oriented research project and computer work are required. Prerequisite: ECON 603.
- MKTG 661: MARKETING STRATEGY 3 s.h.**
A study of strategies for attaining a suitable "marketing mix" for various types of entities. Marketing knowledge from previous courses and experiences will be applied to the formation of overall programs for dealing with both international and domestic marketing problems. Prerequisite: MKTG 360.

Master of Science Degree in Communication

College of Arts and Sciences

Department of Communication

Graduate Faculty

Professors: C. Felicetti, A. Larson, D. Siddiqui; **Associate Professors:** H. Fueg, S. Kuehn, P. Marini, J. Washington; **Assistant Professor:** S. Hilton

Program Objectives

The graduate program in communication develops the competencies and knowledge required for graduates to perform effectively as training and development specialists in business, education, and government. The objectives are to prepare an individual to administer training programs, to facilitate performance within an organization, to design training programs based on specific needs, to conduct such programs, and to serve as a consultant to management and others in the identification and solution to training problems.

While students with any undergraduate degree are welcome in the program, it should be of particular interest to those with undergraduate degrees in communication, business, or education. Depending upon the undergraduate degree and the proper selection of electives, careers in other areas of communication are available.

Students interested in a career in higher education might consider the possibility of doctoral work following completion of the master's degree program.

Admission Requirements

College of Graduate Studies admission requirements apply with the following additions:

- All applicants must submit a statement of purpose for pursuing the M.S. in the Department of Communication.
- Admission on a provisional basis may be granted if the applicant's QPA is between 2.00 and 2.75 on a 4.00 scale and a raw score of 45 or above is achieved on the Miller Analogies Test or a combined score of 1,000 is obtained on the Graduate Record Examination. Degree status may be obtained upon completion of 12 semester hours with a minimum of 3.0 average.
- Individuals with disabilities are encouraged to meet with the department chair prior to admission to the program.
- Non-native applicants must submit TOEFL scores. TOEFL scores of 600 or above are required for admission to the degree program.

Degree Requirements

To fulfill the degree requirements for graduation, the student must complete 36 semester hours, including required courses with a QPA of 3.00 or better on a 4.00 scale. There is also a media writing competency for which COMM 171: Writing for Media, may be required if sufficient background is not obtained through previous course work or experi-

ence as demonstrated through portfolio or testing. This decision will be made in consultation with your advisor.

Transfer Credits

A maximum of nine semester hours of graduate course work may be transferred toward the degree. These hours must come from an accredited institution and must have a grade of “B” or better.

Requirements for Graduation

The following courses are required of all students graduating with a Master of Science degree in communication.

COMM 545:	Theory and Application of Production Planning	3 s.h.
COMM 556:	Training and Development Planning and Design	3 s.h.
COMM 559:	Management of the Communication Process	3 s.h.
COMM 560:	Audio and Television Production	3 s.h.
COMM 565:	Photography and Graphics Production	3 s.h.
COMM 580:	Applied Design and Production	3 s.h.
COMM 620:	Training and Development Research	3 s.h.
COMM 657:	Advanced Applied Design and Production	3 s.h.
	Media Writing Competency	0 s.h.

In addition to the above listed courses, each student must satisfactorily complete an original research effort. Either of the following courses will satisfy this requirement.

COMM 656:	Research in Communication	3 s.h.
COMM 700:	Thesis	6 s.h.

To complete the program, a student may select courses within the Department of Communication or from related disciplines. All elective courses should be approved by the student’s advisor.

Electives

Electives may be taken from any curriculum in the graduate catalog if approved by their advisor. Students are encouraged to go outside the Department of Communication for courses if their career goals and interests will benefit.

No more than six hours of 400-level courses taken for graduate credit may count toward the master’s degree.

Placement

Placement of past graduates has been excellent in teaching; business, industry, and government training and development programs; employee/corporate communication programs; media sales and production; and doctoral and specialist programs.

Advisement

Based on career goals of the student, an advisor is assigned from the graduate faculty of the department.

Advisement is at the convenience of the student and may occur at any time. Frequently the advisor will recommend the student talk with another member of the faculty who may be more closely associated with a specific problem or interest of the student.

In all cases, the responsibility of meeting the stated requirements of the master’s degree lies with the student.

Graduate Assistantships

Graduate assistants are employed in the Department of Communication in such areas as television management, radio management, television direction, photography production, and journalism. These assistantships usually require 10 hours of work per week, for which partial tuition is waived and a small bi-weekly stipend is paid. (A number of assistantships are available to outstanding international students, consisting of a 10-hour work assignment with a partial waiver of tuition.) Assistantships run from September to May; no student may be employed in more than one assistantship. *Awards are made as vacancies exist, and are based on the applicant's professional qualifications as shown in transcripts, resumé, and portfolio of work samples. A personal interview is desirable.*

Applicants for graduate assistantships must complete the regular admission procedure, then file a letter of application with the chair of the Department of Communication. Applications should be received no later than March 15; appointments are usually made by May 15 of each year.

Internships

The Department of Communication has maintained a cooperative arrangement with public schools, businesses, and governmental agencies for over a decade. Students may intern with such organizations in training and development of other areas. The internship is designed to provide on-the-job experience for the student to make the transition between classroom assignments and actual application of professional training. Consequently, the course should be reserved until the latter part of an individual's program.

Physical Facilities

The Department of Communication is housed in Becker Hall and has outstanding physical facilities. In addition to modern classrooms, there are:

- modern full-color television production studio, control room, and editing facilities
- computer controlled multi-image studio
- photographic darkrooms
- audio production studios
- research area
- graphics workshop
- desktop publishing
- interactive video technology
- 1,000-watt FM radio broadcast station

Also available to students in Becker Hall is the Computer Lab, consisting of modern main frame, mini-and microcomputer stations.

Course Sequence

Due to the highly integrated and prescriptive nature of the program, it is imperative students discuss course sequencing with their advisor. Students who get out of sequence could take three or four years to complete degree requirements. The program can be completed in three semesters. However, students are encouraged to complete their requirements in four semesters and take advantage of strengthening their skills through involvement in co-curricular activities.

Communication Courses

- COMM 400: MEDIA ADVERTISING** 3 s.h.
Introduces the student to media strategies, creative development, and budgeting of advertising plans for national and major-market media. The course includes a review of basic concepts in advertising.
- COMM 405: PRESENTATION GRAPHICS** 3 s.h.
Design and production of graphic materials for the presentation of information in training sessions, sales and stockholder meetings, and other small and large group situations. Must be taken concurrently with SCT 214: Business and Professional Speaking.
- COMM 411: FOUNDATIONS OF BROADCASTING** 3 s.h.
An overview of the broadcasting industry, including history, technical aspects, station and network organization, sales, ratings, programming, and social influences. A foundation course for radio-TV career preparation, related fields of communication, and the development of knowledgeable consumers of broadcast media.
- COMM 415: LOCAL ADVERTISING** 3 s.h.
A professional course in planning, scheduling, producing, and buying and selling advertising at the local level, with specific attention to the small business client.
- COMM 428: MASS MEDIA PROGRAMMING ANALYSIS** 3 s.h.
Develops advanced skills in programming, comparing, and analyzing media content for broadcast and print media professionals. Emphasis is placed on applying research skills to analyze audience needs and evaluating message effectiveness applicable in a variety of mass communication programming campaigns. Prerequisite: COMM 352.
- COMM 431: PUBLIC RELATIONS PRINCIPLES AND PRACTICE** 3 s.h.
This course is designed to provide fundamental instruction in public relations practices, including program planning and evaluation, working with the media, writing for public relations, and coordinating special events and functions. The structure and process of public relations in business, institutions, and American society will be explored through readings and discussion.
- COMM 441: ADVANCED MEDIA WRITING** 3 s.h.
Extensive work in research, writing, and marketing of written products for magazines, newspapers, and other publications. The course work also requires the selection and acquisition of appropriate photographs and graphics to complement the articles. Prerequisites: COMM 171 and 251.
- COMM 442: BROADCAST NEWS AND CONTINUITY WRITING** 3 s.h.
Provides students with advanced instruction and experience in writing news, commercials, public service announcements, and promotional copy for the broadcast media. Prerequisites: COMM 100, 152, and 171.
- COMM 443: PROMOTIONAL WRITING** 3 s.h.
Provides students with advanced instruction and experience in public relations and advertising writing. Prerequisites: COMM 100, 152, and 171.
- COMM 452: COMMUNICATION LAW** 3 s.h.
Introduces the student to various laws such as those of libel, privacy, copyright, access, and FTC and FCC rules and regulations governing the fields of communication.
- COMM 460: TELEVISION DIRECTING** 3 s.h.
Develops the skills needed to direct a variety of television studio productions, including news, interview, demonstration, and dramatic programs. Emphasis is on both technical and aesthetic directing skills. Prerequisites: COMM 351 or other television production experience and permission of the instructor. Four contact hours.
- COMM 470: VISUAL LITERACY** 3 s.h.
This course examines the theoretical basis for encoding and decoding visual statements, both temporal and spatial. It also studies the technology which has expanded and enhanced the powers and pervasiveness of visual communication. Fall, annually.
- COMM 488: MEDIA PROGRAM DESIGN FOR ORGANIZATIONS** 3 s.h.
Develops skills in devising communication strategies to design and develop an organization's media programs for training purposes. Skill areas include drafting communication objectives, developing plans for using communication media for training, and evaluating communication media used for effectiveness. Emphasis is placed on applying these skills to produce communication media for training programs. Prerequisite: COMM 352 or permission of the instructor.
- COMM 489: GLOBAL MASS COMMUNICATION** 3 s.h.
This course is intended to enable the student to effectively interact with the new culturally diverse audience and workforce in the American business and industry. The contents will consist of the latest innovatively designed resources on cultural diversity, global mass communication competencies, and positive attitudes. Also included

will be imaginative conceptualization techniques of designing mass media messages suited to the new realities of cultural diversity.

COMM 499: SPECIAL TOPICS IN COMMUNICATION 1-3 s.h.

Focuses on a single, broad contemporary topic of current interest in communication and related fields. Course content varies from semester to semester. Topics to be considered will be announced in advance. May be taken three times for credit.

COMM 500: MASS COMMUNICATION THEORY AND APPLICATION 3 s.h.

This course provides a foundation in social and behavioral theory of mass communication including, but not limited to, information theory, behaviorism, balance theory, two-step flow theory, uses and gratifications theory, and structural functionalism. Emphasis is placed on applying theoretical models to the analysis of problems of media professionals in order to gain insight into possible solutions. Fall, annually.

COMM 545: THEORY AND APPLICATION OF PRODUCTION PLANNING 3 s.h.**

Develops an understanding of the basic principles of communication models and the production process and relates them to the production of various media for educational and/or training purposes. Included are audience analyses, communication theory, development of content, treatments and strategies, and other techniques leading to the design of multi-media productions.

COMM 548: DISTANCE LEARNING: MEDIA STRATEGIES 3 s.h.

This course will explore the various media strategies used to deliver distance learning. Learners will examine the various modes of delivering distance learning from printed correspondence courses to the newer media technologies. Media will be analyzed to determine the best delivery system for specific audiences and various communication/educational goals. Spring or summer, annually.

COMM 551: PUBLIC RELATIONS MESSAGE DESIGN 3 s.h.

Provides advanced instruction in persuasion techniques in the design of public relations. Successful case studies are analyzed in terms of persuasion techniques used. Prerequisites: COMM 431 or permission of instructor. Spring, annually.

COMM 556: TRAINING AND DEVELOPMENT PLANNING AND DESIGN 3 s.h.**

Investigates various theories of learning and instructional strategies used in training in corporate organizations and educational environments. The participant will identify a method appropriate to his or her content area, and plan and design an instructional system suited to adult learners in an in-service training environment.

COMM 558: SOCIETY, LAW, AND MEDIA TECHNOLOGY 1-3 s.h.

This course will examine the impact of media technology in society. The course will be divided into three distinct topical sessions, each bearing one credit load. Society will cover the experiences of various cultures in the selection and use of media technology. Law will cover the regulations which influence the proliferation of media technology including Pennsylvania Department of Education standards and guidelines as well as local and federal regulations and policies. Media technology will examine emerging technologies to determine their appropriateness to various educational and training environments. Students can enroll for 1-3 credits based on topical sessions scheduled. Summer, annually.

COMM 559: MANAGEMENT OF THE COMMUNICATION PROCESS 3 s.h.**

Defines and applies the general principles of management—planning, organizing, staffing, directing, and controlling—to the design and administration of communication and education programs. Relates behavioral variables to understanding and motivating employees.

COMM 560: AUDIO AND TELEVISION PRODUCTION 3 s.h.**

Develops basic skills in audio, ENG, and television production. A variety of projects in both media concentrates on proper equipment operation and recording and editing techniques.

COMM 564: SCRIPTWRITING 3 s.h.

Develops techniques and skills in writing scripts for a wide range of radio, television, motion picture, and slide/sound presentations. Emphasis is on creative writing within the structure of the intended medium.

COMM 565: PHOTOGRAPHY AND GRAPHICS PRODUCTION 3 s.h.**

Provides an integrated introduction into graphic and photographic production techniques. Layout, design, and composition techniques will be developed.

COMM 580: APPLIED DESIGN AND PRODUCTION 3 s.h.**

Applies the processes learned in COMM 545. Students will apply concept skills and strategies in basic multimedia design and production for training or instructional units. Prerequisite: COMM 545.

COMM 591: INDEPENDENT STUDY 1-2 s.h.

Allows the imaginative student to structure an independent research project in the area of communication with a minimum of faculty supervision. A proposal specifying objectives, methods, and evaluation techniques must be submitted and approved by the student's advisor prior to enrolling in the course. 1 or 2 credit hours.

- COMM 620: TRAINING AND DEVELOPMENT RESEARCH** 3 s.h.
Develops those research skills necessary for the evaluation and communication of educational/training needs and outcomes. Specifically, skills in questioning, performance observation, research design, data reduction, and reporting. Prerequisite: COMM 545.
- COMM 656: RESEARCH IN COMMUNICATION** 3 s.h.
Independent investigation of a problem in a specific communication area. The project must be presented in written form and accepted by the research advisor. Prerequisite: COMM 620.
- COMM 657: ADVANCED APPLIED DESIGN AND PRODUCTION** 3 s.h.
Incorporates advanced design and production skills. Students produce more complex training/instructional materials for multimedia projects. Prerequisites: COMM 545 and permission of instructor.
- COMM 691: SEMINAR IN COMMUNICATION 2 s.h.
Focuses on the various aspects of human resource development. Guest lecturers will be utilized and innovative experiments or procedures reviewed. Prerequisites: COMM 580, 620.
- COMM 699: COMMUNICATION INTERNSHIP 1-3 s.h.
Provides practical experience in the supervision in and operations of some aspect of a communication/instructional system program. A proposal specifying objectives, methods, and evaluation techniques must be submitted and approved by the student's advisor and the cooperating agency prior to enrolling in the course.
- COMM 700: THESIS 6 s.h.
Requires each student to develop a project or thesis in some area of communication.

**Required courses.

Master of Science Degree in Communication Sciences and Disorders

College of Education and Human Services

Graduate Faculty

Professors: D. Hetrick, C. McAleer; **Associate Professors:** J. Bauman-Waengler, H. Savage; **Assistant Professor:** J. Jarecki-Liu

The Communication Sciences and Disorders (CSD) Department offers a graduate program leading to a Master of Science degree in speech pathology. The graduate program is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association.

Program Objectives

The academic goals of the program are:

- To provide a quality education to a small number of master's degree students. The department has a commitment to maintain a faculty-to-student ratio of 6:1; maintain a faculty with extensive backgrounds who are actively involved in research and scholarship, but dedicated to teaching; and maintain up-to-date materials and equipment for teaching, clinical activities, and research.
- To ensure adequate student knowledge in the normal physical, biological, and psychological aspects of speech, language, and hearing.
- To introduce the student to the closely related professional areas of medicine, teaching of the deaf, psychology, and dentistry.
- To facilitate an interdisciplinary view of disorders of human communication.
- To develop self-study skills necessary to keep abreast of new scientific information.
- To offer a degree program suitable for both the student who plans for the master's degree and the student who plans to pursue doctoral study.
- To prepare students to work in diverse occupational settings including but not limited to hospitals, rehabilitation centers, private practices, public schools, etc.
- To prepare students to carry out research projects in the areas of speech, language, and audiology.

The clinical education goals of the program are:

- To prepare students to function as independent clinicians. These levels of function will exceed or be commensurate with clinical certification guidelines suggested by the American Speech-Language-Hearing Association, guidelines for Pennsylvania state licensure in speech pathology, and standards implemented by the Pennsylvania Department of Education.
- To improve clinical competencies in the assessment and management of individuals having communication disorders.

- To prepare the student to realize the changing role of the speech-language pathologist and audiologist in our society.
- To prepare speech-language pathologists to fill diverse roles in their discipline.
- To foster attitudes conducive to high quality, ethical professional practice.
- To prepare the student to complete diagnostic evaluations testing both children and adults.
- To prepare the student to implement appropriate diagnostic procedures and to draw conclusions and make recommendations based on the results of the diagnostic session.
- To prepare the student to counsel clients regarding the results of the diagnostic evaluation. Students will be able to relay information concerning the results of the testing as well as inform the client of recommendations for further testing, referral, etc.
- To prepare the student to design and implement a program of rehabilitation for both children and adults. This will include writing lesson plans where short-term and long-term objectives are appropriately formulated.
- To prepare the graduate student to maintain accurate and appropriate records and demonstrate a knowledge that these records are confidential. They will also demonstrate a knowledge that they are accountable for the services that they provide.
- To prepare the student to demonstrate an understanding of professional, clinical, and basic research and to show that they can apply the results of such research to the clinical setting.

Admission Requirements

College of Graduate Studies admission requirements apply with the following additions:

- A baccalaureate degree.
- An applicant should have achieved a 3.0 quality-point average (on a four-point scale) for the baccalaureate degree.
- Satisfactory score on Graduate Record Exam (GRE).
- Writing proficiency as demonstrated by a one-page letter of intent.
- Fifteen semester hours of credit in courses related to normal development and the sciences related to the use of speech, hearing, and language; three credits in speech pathology; three credits in language disorders; six credits in audiology, including three credits in aural rehabilitation; three credits in clinical practice or clinical observation; three credits in statistics; six credits in behavioral/social sciences; three credits in biological/physical sciences; and three credits in mathematics. Students may make up undergraduate deficiencies.
- Applicants who fail to satisfy the foregoing requirements may be admitted conditionally. In such cases, the terms of the conditional admission will be specified for the individual applicant.

Degree Requirements

General Regulations and Procedures

Transfer of Credit. The minimum course credit requirement for the master's degree is 33 semester hours. Of this, at least 24 semester hours must be earned at Clarion University of Pennsylvania. A maximum of 30 percent of the total credits necessary for completion of the master's degree may be accepted from another accredited graduate school. The

student is responsible for filing an official transcript of any work presented for transfer credit.

Advisement. Upon acceptance into the program, students will be assigned to a departmental advisor. A program of study will be planned by the student and his or her advisor and will be subject to the approval of the department committee on graduate studies during the first semester of study. This plan will be filed and maintained in the student's academic file. Students must meet with their academic advisor every semester to pre-register for courses.

Grades. An average grade of "B"(3.00/4.00) is required.

Graduate Courses. Graduate courses are numbered in the 500s. Some courses open to undergraduates (400 numbers) may be taken for graduate credit by permission of the student's advisor. A maximum of six credits at the 400 level may be taken for graduate credit and applied toward a graduate degree.

Specific Requirements

- The student must fulfill all general requirements for the degree and complete a minimum of 33 semester hours of credit for the degree.
- The graduate student majoring in speech-language pathology will complete a minimum of 30 credits in speech-language pathology courses, including CSD 505, CSD 520, CSD 540, CSD 589, and three credits in CSD 535.
- Students may elect to take one course outside the major providing their major and minor area requirements will have been met. A complete listing of graduate courses in communication sciences and disorders is carried in the course description section which follows.

Options. Thesis, research, and academic programs are available. The decision as to whether a given student shall follow one program or the other rests with the department, as it considers the recommendations of the advisor and the request of the student. The student will complete an approved program under one of the following options:

Thesis Option: Thirty-six semester hours, including six credits in CSD 590. After the completion of a satisfactory thesis, the candidate will be asked to make an oral defense of this thesis before a faculty committee.

Research Option: Thirty-three semester hours, including three credits in CSD 590. This option does not require a thesis, but does require a research paper or project.

Academic: Thirty-six semester hours, including an additional six credits in the major.

- Clinical proficiency must be demonstrated.
- Two externships in a clinic and/or public school are necessary to satisfactorily complete the clinic clock hours required for the degree. Students must have a cumulative quality-point average of 3.00 and must be making satisfactory progress toward the degree to be permitted to enroll in the externship program.
- Academic and clinical practicum requirements for the Certificate of Clinical Competency in Speech-Language Pathology of the American Speech-Language-Hearing Association must be fulfilled.
- Students who wish to obtain a Pennsylvania Teaching Certificate for Speech Correction must obtain a master's degree in CSD, must complete an externship in the public schools, and must complete CSD 554: Professional Practicum or have had a

commensurate course. In addition, the student must pass the following tests: NTE Core Battery tests, and Specialty Area Test—Teaching Speech to Students with Language Impairments. Applications for these tests can be obtained at the Office of Field Services.

Placement

Graduates of the program are assisted by the faculty and the university's Career Services in finding professional positions in public and private schools, colleges and universities, hospitals, research centers, health departments, clinical service centers, industry, or private practice. Graduates of the program have historically enjoyed excellent professional placement.

Graduate Assistantships

A number of graduate assistantships and other forms of financial aid are available. Individuals who want to be considered for financial assistance should so indicate at the time of application.

Externship

Six-and 12-credit externships are available in a wide variety of environments to augment the classroom experiences and broaden clinical experiences.

Physical Facilities

The academic component of the department is housed in the first floor of the Keeling Health Center. Facilities include classrooms, a speech science/anatomy and physiology lab, a hearing science lab, a microcomputer lab, a library which includes a large variety of videotape resources, a student study area, and departmental and faculty offices.

An independent Speech and Hearing Clinic is located on the ground floor of the Keeling Health Center and includes individual and group clinic rooms, a conference and seminar room, an audiological suite, a clinical instrumentation laboratory, a student study area, a reception area, videotaping facilities, and a 10-station closed circuit television system.

Communication Sciences and Disorders Courses

CSD 422/522: CLINICAL EXTERNSHIP 6 or 12 s.h.
Supervised observation of and participation in school and/or clinic environments. Prerequisite: CSD 540.

CSD 472: SEMINAR IN SPEECH SCIENCE 3 s.h.
This course begins with a review of the speech mechanism as a servosystem and transducer and basic knowledge of the physics of sound. The remainder of the course focuses attention and is structured on the concept that the speech mechanism is a chain of events physiologically, acoustically, and perceptually. Each link in this chain of events is studied in terms of basic knowledge, pertinent research, and each link's contribution to the speech chain as a whole. Prerequisite: CSD 456 or a basic course in phonetics and/or speech science. Each semester.

CSD 500: APHASIA 3 s.h.
This course is a comprehensive study of the neuroanatomical implications related to acquired aphasia (dysphasia) in adulthood, although study of the symptoms and treatment of both sensory states and motor disturbances in aphasia is made. The current literature is reviewed and facilities are investigated. Opportunities are provided for the student to participate in individual and group therapy, and for visits to centers where these types of problems are diagnosed and treated. Guidance and counseling are provided to design an independent study in this area.

CSD 505: ARTICULATORY AND PHONOLOGICAL DISORDERS IN CHILDREN 3 s.h.
Articulatory and phonological features of the American English sound system are examined in relation to other developing linguistic functions. The assessment of disordered articulatory and phonological behavior is stressed,

and differential diagnosis is emphasized. Based upon several traditional and current theoretical models, possibilities for therapeutic interventions are presented.

CSD 510: SEMINAR IN NEUROPATHOLOGY 3 s.h.

This course is a comprehensive study of pathologies of the central nervous system. Methods for identifying and treating speech, language, and communication problems associated with progressive and non-progressive neurological disorders are explored. Neuropathologies studied include the dementia, syndromes associated with right-hemisphere lesions, and deficits subsequent to closed-head injury. A unit on normal swallow and dysphagia is included in the course. Opportunity will be provided for independent investigation and clinical participation.

CSD 515: MAXILLOFACIAL ANOMALIES 3 s.h.

This course is a comprehensive study of clinical diagnosis and treatment of patients with communicative disorders related to clefting and/or associated syndromes. Current research regarding anatomy and physiology of the palate and velopharyngeal structures for speech production is detailed. The genetics of clefting and associated syndromes is discussed. Special attention is directed to early growth and development of infants with clefts. Opportunities for observation of a craniofacial team multidisciplinary evaluations and team planning are provided in medical settings.

CSD 520: LANGUAGE DISORDERS IN CHILDREN 3 s.h.

Models of the language function with their justifications are identified and critically analyzed. A review of normal language development is included to provide comparison with deviations. Diagnostic procedures utilized with language disorders in children are investigated; therapeutic means to influence them will be presented. Differential diagnostic specifics of certain language disorders such as those associated with deafness, autism, mental retardation, and language learning disabilities are included.

CSD 525: STUTTERING 3 s.h.

This course emphasizes investigation of the major theories and therapies of stuttering. Theories of etiology and of development of stuttering are included. The development of an understanding of stuttering behavior and similar speech behavior is included. Management strategies and therapies are also investigated.

CSD 530: VOICE 3 s.h.

This course includes the study of human voice and its manifestations across the life span. Students will be acquainted with new developments, issues, and trends that cover the entire spectrum of voice perception and production, including vocal development and life span changes, and the continuum of voice production from disorders through superior performance. Focus will include pathophysiology of disorders, instrumental and noninstrumental assessment, interdisciplinary team management, and treatment.

CSD 533: INSTRUMENTATION AND HEARING SCIENCE 3 s.h.

This course deals with instruments used in a speech and hearing program and also covers basic principles of hearing science. Some information on psychoacoustics is also provided.

CSD 534: OTOLARYNGOLOGY 1 s.h.

This course is an introduction to the profession of otolaryngology. The course is taught by a board-certified physician and offered once a year.

CSD 535: AUDIOLOGY SEMINAR 3 or 6 s.h.

This course is divided into two three-credit seminars. The first seminar reviews anatomy and physiology of the ear and ear pathologies. Basic audiometric test procedures for clinical audiology will be studied. The second seminar deals with special audiometric testing, including site of lesion testing, an introduction to evoked potential testing and electronystagmography, and industrial audiology.

CSD 540: CLINICAL PRACTICE 3 or 6 s.h.

This course entails practice, under supervision, in applying theory to the assessment and management of individuals from preschool through adulthood having significant disorders of speech, hearing, or language. The clinical experience is relatively independent in the assessment, organizing, and carrying out of effective plans of therapy. The student should demonstrate an interdisciplinary approach and be able to generalize on the area of the disorder treated, as well as deal appropriately with the specific clients treated.

CSD 550: MOTOR SPEECH DISORDERS 3 s.h.

This course explores the causes, nature, and dynamics of both developmental and acquired forms of the motor speech disorders of apraxia and dysarthria. The specific nature of speech disturbances associated with lesions of the motor system and current diagnostic protocols and management strategies associated with each identified.

CSD 554: PROFESSIONAL PRACTICUM 3 s.h.

This course explores current professional issues and trends in the practice of speech-language pathology and audiology. Topics include licensure and certification, and an emphasis is placed on the ethical/legal restrictions and obligations that influence the professional practitioner.

CSD 589: INTRODUCTION TO GRADUATE STUDY 3 s.h.

This course reviews the history and structure of the professions of speech-language pathology and audiology and their relationship to related disciplines. The design of research and professional writing style employed in the *Journal of Speech and Hearing Research* is emphasized.

CSD 590: RESEARCH 3 or 6 s.h.

The student may complete a study in speech or language pathology and audiology or related areas under the supervision of a staff member. The student may select the thesis option in which six credits are required. The student may select the research option in which three or six credits culminate in a written report presented to the faculty advisor. Types of investigations which might be completed are original studies, comprehensive literature reviews, replication of studies, or completion of a portion of a larger study. Students must fill out independent study forms with their research advisor before registering for CSD 590.

CSD 592: DYSPHAGIA 3 s.h.

This course presents an introduction to swallowing disorders including basic terminology, anatomical and physiological etiologies, and current assessment and management procedures, with special attention to laryngectomized and tracheotomized patients. The competencies, responsibilities, and roles of the speech pathologist in various clinical settings will be discussed, as well as risk factors involved in patient care. Observations and experiential learning situations will be provided.

CSD 598: SPECIAL TOPICS 1-6 s.h.

Topics in various areas of speech pathology and audiology. The format used will be selected by the professor as most suitable to the study. The course may be offered on request of students, subject to the availability of staff. Enrollment by consent of the instructor. On demand.

CSD 599: INDEPENDENT STUDIES IN COMMUNICATION SCIENCES AND DISORDERS 1-3 s.h.

This course is designed to provide students with an opportunity to explore an area of special need or interest in speech pathology and audiology in depth under the supervision of a member of the department. Students must develop a proposed study plan and secure the approval of the proposed director and department chair prior to registration. Repeatable for a maximum of 6 semester hours.

Master of Education Degrees in Department of Education

College of Education and Human Services

Graduate Faculty

Professors: L. Brown, S. McKee, J. Smith, K. Smith, S. Stalker, D. Tate; **Associate Professors:** E. Caropreso, A. Creany, R. Couch, B. Grugel, V. Harry, M. McLaughlin, N. Sayre; **Assistant Professors:** R. DeLuca, C. Diehl-Wyandt, J. McCullough, V. Yenika-Agbaw

M.Ed. in Elementary Education

Program Objectives

The master's degree program in elementary education encourages students to view themselves as researchers of teaching and learning and as professionals whose continued growth can best be met through inquiry, reflection, and sustained dialogues with peers. It affords practitioners the opportunity to share effective classroom practices while reading, interpreting, and analyzing current research and professional literature.

Admission Requirements

Clarion University's general admission requirements apply, with the following supplemental requirements:

- The applicant must have elementary education certification. If the applicant does not meet this requirement, the graduate faculty of the department shall determine existing deficiencies and how they must be met. Certification requirements must be met prior to any graduate work.
- Admission to provisional status may be granted at the discretion of the graduate faculty if the applicant's QPA is less than 2.75/4.00. Regular status may be granted upon completion of 12 semester hours of graduate study with a minimum of 3.00/4.00 average.

Degree Requirements

TOTAL 30 s.h.

Four Core Competency Areas	12 s.h.
Research	3 s.h.
Pedagogy	3 s.h.
Curriculum	3 s.h.
Professional Seminar	3 s.h.
Specialization Courses	12 s.h.

Course selection is to be made from the following:

ED	403:	Field Experience and Methods in Environmental Education	3 s.h.
ED	501:	Seminar in Critical Educational Issues	3 s.h.
ED	506:	Gender Issues in Education	3 s.h.
ED	509:	Observations and Analysis of the Urban Classroom	3 s.h.
ED	510:	Developmentally and Culturally Appropriate Practice: Theory, Research, and Practices	3 s.h.
ED	517:	Educational Computer Application	3 s.h.
ED	521:	Instructional Leadership Skills	3 s.h.

ED	526:	Sociology of Education	3 s.h.
ED	533:	Recent Developments in Elementary Social Studies	3 s.h.
ED	537:	Strategies and Problems of Teaching Elementary School Mathematics	3 s.h.
ED	546:	Reading and Language Arts in Early Childhood	3 s.h.
ED	560:	Defining the Literacy Process	3 s.h.
ED	563:	Reading Pedagogy	3 s.h.
ED	567:	Secondary, College and Adult Reading Instruction	3 s.h.
ED	568:	Language and Literacy	3 s.h.
ED	575:	Seminar in Children's Literature	3 s.h.
ED	617:	Advanced Educational Technology	3 s.h.
ED	620:	Internet Applications for K-12 Educators	3 s.h.
SPED	580:	Special Reading Instruction	3 s.h.
SCED	502:	Investigative Techniques and Process Approach to Modern Science Curricula	3 s.h.
SCED	505:	Investigative Techniques in the Life Sciences	3 s.h.
SCED	576:	Science, Technology, and Society	3 s.h.
Electives			6 s.h.

To be selected from appropriate 400- or 500-level courses as approved by the advisor. A maximum of three credits of 400-level courses approved for graduate credit may be counted toward the degree.

Thesis credits may be substituted as electives.

Written Comprehensive Exam required.

Graduation Requirements

Students must complete 30 credit hours of required and advisor approved elective courses with a cumulative grade-point average of 3.00/4.00. Additionally, students are required to complete a written comprehensive exam representing the following core competencies: research, pedagogy, and curriculum. Also, in relation to the core competencies, content from the student's area of specialization will be incorporated within these areas.

M.Ed. in Reading

Program Objectives

The master's degree program in reading encourages students to view themselves as researchers of teaching and learning and as professionals whose continued growth can best be met through inquiry, reflection, and sustained dialogues with peers. It affords practitioners the opportunity to share effective classroom practices while reading, interpreting, and analyzing current research and professional literature.

Admission Requirements for Reading or Reading Specialist

Clarion University's general admission requirements apply, with the following supplemental requirements:

- The applicant must have educational certification and have successfully completed a course in reading/language arts and children's literature.
- Admission to provisional status may be granted at the discretion of the graduate faculty if the applicant's QPA is less than 2.75/4.00. Regular status may be granted upon completion of 12 semester hours of graduate study with a minimum of 3.00/4.00 average.

Degree Requirements

TOTAL 36 s.h.

Four Core Competency Areas	12 s.h.
Research	3 s.h.
Pedagogy	3 s.h.
Curriculum	3 s.h.
Professional Seminar	3 s.h.
Specialization Courses	21 s.h.
ED 560: Defining the Literacy Process	3 s.h.
ED 568: Language and Literacy	3 s.h.
ED 569: Assessment of Literacy	3 s.h.
ED 570: Practicum I: Analysis	3 s.h.
ED 571: Practicum II: Instruction	3 s.h.
ED 574: Reading Program Organization, Administration, and Supervision	3 s.h.
SPED 580: Special Reading Instruction	3 s.h.
Electives	3 s.h.

To be selected from education or content area courses as approved by the advisor. Thesis credits may be substituted as electives.

Reading Specialist Test (NTE) required.

Written Comprehensive Exam required.

Graduation Requirements

Students must complete 36 credit hours of required and advisor approved elective courses with a cumulative grade-point average of 3.00/4.00. Additionally, students are required to pass the Reading Specialist Test (NTE) and a written comprehensive examination representing the following core competencies: research, pedagogy, and curriculum. Also, in relation to the core competencies, content from the student's area of specialization will be incorporated within these areas.

Reading Specialist Certification

Satisfactory completion of the M.Ed. in reading meets the requirements for reading specialist certification. Students desiring reading specialist certification without the degree must complete the following sequence of courses:

Reading Specialist Certification	27 s.h.
ED 520: Introduction to Research	3 s.h.
ED 560: Defining the Literacy Process	3 s.h.
ED 563: Reading Pedagogy	3 s.h.
ED 568: Language and Literacy	3 s.h.
ED 569: Assessment of Literacy	3 s.h.
ED 570: Practicum I: Analysis	3 s.h.
ED 571: Practicum II: Instruction	3 s.h.
ED 574: Reading Program Organization, Administration, and Supervision	3 s.h.
SPED 580: Special Reading Instruction	3 s.h.

Placement

Typically, graduate program enrollees are already involved in professional careers that are being enhanced by the graduate studies. For those people who are without career placement, the faculty and the university Career Services can provide assistance in seeking appropriate employment. Students should register with Career Services before graduation.

Graduate Assistantships

A limited number of graduate assistantships are granted for 10 and/or 20 hours of departmental service per week in exchange for a waiver of tuition and a stipend. Applications are available in the Department of Education office and the Graduate Studies office and should be submitted to the department chair as soon as the student has been admitted to the graduate program.

Advisement

Upon acceptance into the graduate program, students will be assigned a department advisor who is qualified to assist the student in his or her specific career goals. The responsibility for meeting all stated requirements for the master's degree, however, is with the student.

Education Courses

ECH 401: CREATIVE RESPONSE TO CONFLICT 3 s.h.

A study of the current research in the development of a classroom environment which fosters cooperation, communication, affirmation, and problem-solving for children as well as for teachers, staff, instructional teams, parents, support personnel, and other adults. Emphasis on human capabilities for resolving conflicts at various life stages and situations. Examination of a range of discipline models as their implementation relates to the classroom environment. (This course is designed to be taken in conjunction with student teaching in the undergraduate program, or as an elective in the master's program.) Prerequisite: ED 121. Each semester.

ECH 420: INCIDENTAL LEARNING 3 s.h.

The course examines incidental learning gained by young children through their interactions with the people and products of their society's major institutions. It asks such questions as these: How do children learn as incidental by-products of these interactions; how can teachers, for example, plan encounters (with people, materials, and environments) so that the encounters contribute to children's learning goals rather than subvert them. Prerequisite: ED 121. Each semester.

ED 403: FIELD EXPERIENCE AND METHODS IN ENVIRONMENTAL EDUCATION 3 s.h.

This course focuses on methods used to teach environmental knowledge, concepts, and concerns, including the history and research in environmental education. The relationship of all curriculum areas to environmental education is examined and practiced. The course may be taken for graduate credit with the approval of the Education Department chair and the instructor. Offered for two weeks at a time between the end of the Spring Semester and the beginning of regular summer school only. McKeever Center in Sandy Lake, PA, will be utilized for presentation of this course.

ED 414: VOLUNTEERS FOR LITERACY 3 s.h.

This course enables student volunteers to teach in literacy programs aimed at adult and secondary school learners in different settings. Basic methods for instruction in vocabulary, comprehension, study skills, and writing are integrated with the aim of fostering an appreciation for reading.

ED 501: SEMINAR IN CRITICAL EDUCATIONAL ISSUES 3 s.h.

This course examines the current critical educational issues with special emphasis on school funding, legal issues, gender equity, curriculum and cultural issues, and school reform.

ED 506: GENDER ISSUES IN EDUCATION 3 s.h.

This course examines the ways in which schools perpetuate gender bias and how educational institutions, as a reflection of the patriarchal society in which they exist, provide different experiences and outcomes for female and male students and teachers. Prerequisite: ED 110 or WS 100 or consent of instructor.

ED 509: OBSERVATIONS AND ANALYSIS OF THE URBAN CLASSROOM 3 s.h.

This course provides opportunities for pre-service teachers, both elementary and secondary education majors, and both undergraduate and graduate students, to observe and participate in urban classrooms. Students travel in university vehicles to visit schools in major urban areas and spend a minimum of five consecutive days participating in urban classrooms. Prerequisite: junior-level standing or consent of instructor. Offered each Summer pre-session.

- ED 510: DEVELOPMENTALLY AND CULTURALLY APPROPRIATE PRACTICE: THEORY, RESEARCH, AND PRACTICES** 3 s.h.
 Developmentally and Culturally Appropriate Practice (DCAP) is culturally congruent pedagogy as a fundamental framework for early childhood education. DCAP emphasizes teachers' multiple/multi-ethnic perspectives in learning and teaching. It promotes culturally congruent practice for individual learners. Students enrolled in the course will have practically oriented knowledge and skills for DCAP by studying the theory and practices from various educators. It will lead them to create their own instructional approaches for DCAP. In the course, students will learn: (1) Developmentally Appropriate Practice (DAP), critiques of DAP and changes from DAP to DCAP; (2) current issues and trends on DCAP in education; (3) teacher preparation for DCAP; and (4) teachers' critical creativity in developing an integrated DCAP. Prerequisite: ED 110 or ED 121.
- ED 517: EDUCATIONAL COMPUTER APPLICATIONS** 3 s.h.
 This course is designed to provide in-service educators (K-12) who have had little or no computer experience with the knowledge, skills, and attitudes necessary to use microcomputers as instructional tools in their classrooms. While acquiring computer skills, students will explore, use, and demonstrate competence in each of the following areas: word processing, databases, spreadsheets, graphics, multimedia, instructional design, telecommunications, and major issues associated with the use of technology in education. This course will provide in-service teachers with the knowledge base to make appropriate decisions regarding the use of technology in their respective classrooms. Not available to students who have taken ED 217 since summer 1994.
- ED 520: INTRODUCTION TO RESEARCH** 3 s.h.
 This seminar course covers the selection, investigation, and writing of a research topic. Students are introduced to the planning of research projects, major methods of obtaining data, descriptive statistics, statistical inferences, methods of analysis and critical evaluation of published research, and the preparation of written reports. Proposed research problems and procedures are prepared for discussion and critical analysis.
- ED 521: INSTRUCTIONAL LEADERSHIP SKILLS** 3 s.h.
 This course involves a survey of various theories, models, and styles of leadership, followed by the application of leadership skills in teacher-pupil and teacher-colleague relationships.
- ED 522: ANALYSIS OF TEACHING** 3 s.h.
 This course presents an analysis of various teaching models and instructional designs. Videotaped lessons and clinical/field experiences applying course competencies will be critiqued by faculty and peers.
- ED 523: CURRICULUM DEVELOPMENT AND EVALUATION** 3 s.h.
 This course will focus on the processes of developing and evaluating school curriculum K-12. Practical application experiences with curriculum models and management systems will be included.
- ED 526: SOCIOLOGY OF EDUCATION** 3 s.h.
 This course is an analysis of the public school as an institution in modern societies and its operation in complex social structures. The course draws upon the science of sociology and other social fields to explain the operation of the school as one of the social systems which operate to influence the development of people in becoming efficient and cooperative members of society.
- ED 533: RECENT DEVELOPMENTS IN ELEMENTARY SOCIAL STUDIES** 3 s.h.
 Students explore recent trends in promoting learning in the social studies as well as study current problems involved. Social forces at work today and their effect on curriculum development are considered.
- ED 534: WORKSHOP IN EDUCATION** 3 s.h.
 The workshop provides opportunities for in-service teachers to encounter new ideas, knowledge, and methods in meeting problems in today's schools. Prerequisite: Teaching experience in the elementary or secondary schools.
- ED 537: STRATEGIES AND PROBLEMS OF TEACHING ELEMENTARY SCHOOL MATHEMATICS** 3 s.h.
 This course deals with recent trends and methods of teaching mathematical concepts and skills appropriate to the elementary grade level. Particular attention is given to diagnostic procedures and to a "hands-on" laboratory approach. Classes are conducted in a well-equipped elementary mathematics laboratory. Recent research which applies to the teaching and learning of mathematical skills and concepts is considered.
- ED 538: GUIDANCE OF ELEMENTARY SCHOOL CHILDREN** 3 s.h.
 This course addresses guidance problems arising in the elementary school and principles and techniques applicable to their solution, and the role of the classroom teacher in providing services to pupils and parents are studied.
- ED 546: READING AND LANGUAGE ARTS IN EARLY CHILDHOOD** 3 s.h.
 Study and observation of the child's early reading behavior during early childhood and observation of other aspects of language arts; exercises for listening experiences and developing writing skills; assessment of some of the causes of difficulties in learning to read and to use language effectively.

- ED 560: DEFINING THE LITERACY PROCESS** 3 s.h.
Students will define and investigate various literacy models for the purpose of creating their own philosophy of best practice based on inquiry and reflection. Investigating current research, students will study how the reader transacts developmentally with the language of the text in a particular context and how the reader is influenced by various social factors. Prerequisite: teaching certification. Fall, annually.
- ED 563: READING PEDAGOGY** 3 s.h.
Students will define and investigate reading as related to the individual learner. Study is made of the current research into sequential and systematic reading development and the application of multi-dimensional techniques, strategies, and materials in the teaching of reading K-12 for both narrative and expository structures. Prerequisite: teaching certification. Spring, annually.
- ED 567: SECONDARY, COLLEGE, AND ADULT READING INSTRUCTION** 3 s.h.
Survey of the reading programs and principles at the secondary and post-secondary levels; study of developmental characteristics, identification and assessment of learners' needs; examination of materials and strategies for various instructional settings and populations. Prerequisite: ED 560 or ED 563.
- ED 568: LANGUAGE AND LITERACY** 3 s.h.
This course is a study of literacy acquisition which includes consideration of developmental and sociocultural factors. The course examines instructional practices which utilize children's literature in teaching the language arts. Writing is emphasized. Prerequisite: graduate or undergraduate course in children's literature. Fall, annually.
- ED 569: ASSESSMENT OF LITERACY** 3 s.h.
Provides an in-depth analysis of assessment strategies and techniques in the field of literacy. Features of this course include evaluating, implementing, and analyzing data gathered from formal and informal assessment approaches for the purpose of planning instruction. Introduction to literacy profile. Prerequisites: ED 560 and ED 563. Spring, annually.
- ED 570: PRACTICUM I: ANALYSIS** 3 s.h.
The investigation of an individual's background to determine possible casual factors for underachievement in reading through (1) the selection and administration of appropriate diagnostic instruments, and (2) a sensitive interpretation of the cumulative results. Prerequisite: ED 569 and permission of the instructor. Course must be taken concurrently with ED 571. Summer, annually.
- ED 571: PRACTICUM II: INSTRUCTION** 3 s.h.
The emphasis in this course is the development of competency in the instructional process of addressing reading problems. The work includes (1) learning the techniques used for corrective instruction, (2) learning how to teach individuals strategies which will enable them to be readers, (3) developing expertise in using materials related to the immediate needs of individuals, and (4) preparing a literacy profile which suggests to schools and other agencies procedures to use for a student's academic progress. Prerequisites: ED 568, ED 569, and permission of the instructor. Course must be taken concurrently with ED 570. Summer, annually.
- ED 574: READING PROGRAM ORGANIZATION, ADMINISTRATION, AND SUPERVISION** 3 s.h.
The organization, administration, and supervision of reading programs from kindergarten through high school. Particular emphasis is given to the functions of a reading specialist and development of a curriculum guide for reading, organizational patterns in reading programs, and procedures for instituting and operating in-service reading education programs. Prerequisites: ED 560 and ED 563. Fall, annually.
- ED 575: SEMINAR IN CHILDREN'S LITERATURE** 3 s.h.
This seminar is an intensive study of various genres of children's literature, with emphasis upon correlating into study units books that appeal to the interests of boys and girls. A study of storytelling techniques and other literature sharing methods are included. Prerequisite: ELED 331 or LS 358.
- ED 576: ADVANCED SEMINAR IN READING AND LITERACY** 3 s.h.
The study and evaluation of research and current reports on reading education issues. Prerequisite: ED 560.
- ED 578: PROFESSIONAL SEMINAR** 3 s.h.
This course is intended to be the capstone course for all graduate students in the Education Department graduate programs. Students will focus on a classroom-based action research project which will serve as an integrating element for knowledge and experiences acquired during the graduate program. Students will recognize the integrity of classroom research and demonstrate proficiency in using and assisting classroom teachers in the process of collecting data, generating hypotheses, and implementing instructional changes grounded in inquiry and reflection. The project will synthesize course readings, discussions, group activities, applications, and observations. It will afford students the opportunity to share effective classroom practices and will require studies of and experiences in interpreting and analyzing pertinent research to promote professional growth. Students will be encouraged to view themselves as researchers of teaching and learning and as professionals whose continued growth can best be met through inquiry, reflection and sustained dialogue with peers. Prerequisite: ED 520. Spring, annually.
- ED 599: SPECIAL TOPICS IN EDUCATION** 1-3 s.h.
Examines current topics and issues in education. Topics, which will be announced in advance, will focus on the needs and interests of in-service educators.

ED 600:	RESEARCH	3-6 s.h.
ED 617:	ADVANCED EDUCATIONAL TECHNOLOGY	3 s.h.
<p>This course is an advanced course for graduate students who have a background in computers or who have taken ED 217 or ED 517 at Clarion University. The focus of this course is the development of knowledge and skills in the following topics: hardware/software maintenance; instructional design; educational electronic networking; sophisticated applications of integrated software; and educational applications of multimedia, including interactive video CD-ROM, sound, text, and graphics. This course will focus on preparing teachers to make appropriate decisions regarding the use of technology in their classrooms/schools. Admission by permission of instructor. On demand.</p>		
ED 620:	INTERNET APPLICATIONS FOR K—12 EDUCATORS	3 s.h.
<p>This three-credit hands-on computer course is designed to introduce K—12 educators to the Internet and assist them in using this multi-faceted resource as an effective teaching tool in the classroom. Participants will be introduced to the history, structure, and overall capabilities of the Internet, including Electronic Mail, Telnet, File Transfer Protocol (FTP), and the World Wide Web. Within this framework, students will design their own web pages which will include instructional links appropriate to their discipline. In addition, students will demonstrate how to integrate Internet information with current curricula in order to present effective instruction. Summer, on demand.</p>		
ED 700:	THESIS	3-6 s.h.

Master of Arts in English

College of Arts and Sciences

Graduate Faculty

Professors: T. Caesar, L. Dennis, D. Fink, K. Graham, D. Sheraw, D. Wilson, G. Xu; **Associate Professors:** J. Bodziock, J. Huber, R. Leary, H. Luthin, E. MacDaniel, P. Terman; **Assistant Professors:** C. Ferry, T. Johnson, K. Smith, D. Sarbin, K. Welsch

Program Objectives

The Master of Arts program in English provides students with a broad background in many areas of English studies and the opportunity to examine areas of particular interest in more depth. The required courses ensure students will experience several modes of thinking and be engaged in significant encounters with literature, critical theory, composition theory and practices, and linguistics. Elective courses allow students to pursue some of their own interests, while seminar papers the students write in preparation for their comprehensive exam enable students to engage in independent research on topics of their own choosing. Throughout the process, students are able to draw on the guidance and the expertise of the graduate faculty to assist them in course work and in independent research.

This program is suitable for those who wish to prepare for Ph.D. programs, for those who seek the M.A. as a terminal degree, and for teachers who require work beyond the bachelor's degree for the purpose of permanent certification or other job requirements.

Admission Requirements

College of Graduate Studies admission requirements apply with the following addition:

- Applicants must submit their Graduate Record Exam (GRE) general test scores.

Requirements for Graduation

To successfully complete the M.A. program in English, the student must:

- Complete 31 credit hours, at least 25 of which must be earned from 500-level courses. Sixteen of the 31 credit hours constitute required course work, while 15 elective credits allow for greater flexibility in appealing to the goals and interests of the student.

Distribution of Required Courses

ENG	501:	Introduction to Graduate Studies in English	1 s.h.
ENG	509:	Seminar in Literary Theory	3 s.h.
ENG	510:	Seminar in English Literature	3 s.h.
ENG	511:	Seminar in American Literature	3 s.h.
ENG	520:	Seminar in Writing: Theory and Research	3 s.h.
ENG	530:	Seminar in Linguistics	3 s.h.

Elective Courses

Students may take as electives any of the 500-level courses offered in the department and up to two 400-level courses chosen from among the following:

ENG	401:	Chaucer
ENG	412:	Shakespeare: Comedies and Histories
ENG	413:	Shakespeare: Tragedies and Romances
ENG	457:	Introduction to Linguistics
ENG	458:	History of the English Language
ENG	459:	Language Acquisition Across Cultures
ENG	482:	Composition: Theory and Practice

As explained more fully in “Guidelines for Qualifying Papers and the Qualifying Exam” (available from the Director of the Graduate English Program), students are required to:

- Complete three proposals for seminar papers. These proposals are then assigned by the graduate director to a proposal committee which may accept any or all of the proposals, reject any or all of the proposals and/or make recommendations for changes to any or all of the proposals. The student is then given the opportunity, if required, to revise and submit proposals that have not been approved.
- Complete three seminar papers on topics of the student’s choosing. While at least two of these papers must be based on work done in graduate courses at Clarion, the student is expected to research and examine the issues more fully than in the class essays. Each of these papers is written under the direction of a different faculty member who must approve the paper before the student is allowed to take the comprehensive exam. Because these papers will represent the culmination of the student’s work in the M.A. program, it is expected that they approach or attain the standards of professional papers. A creative written work or portfolio of shorter creative pieces may be submitted as one of these papers.
- Successfully complete the oral comprehensive examination. The examination is based upon the seminar papers and their critical contexts. The examiners will consist of the three faculty members to whom the seminar papers were submitted. The student is responsible for and may be questioned on the paper and the research involved in the writing of the paper.

Graduate Assistantships

Graduate assistants are given a variety of assignments and experiences useful for personal as well as professional development. Assistants gain valuable computer experience as well as one-to-one tutorial opportunities in working at Clarion University’s Writing Center.

Assistants are also eligible to take part in our mentoring program, which affords students the opportunity to work directly with a composition instructor assisting in small group activity and teaching classes under the supervision of the instructor.

Applicants applying for a graduate assistantship in the English Department must include an additional letter to the department expressing their interest in an assistantship and outlining their qualifications. Applicants also are advised to request that at least one of the people who writes a letter of recommendation speak to the applicant’s ability to tutor writing in a college setting.

English Courses

- ENG 401: CHAUCER** 3 s.h.
Studies in Middle English of Chaucer's early poems, Troilus and Criseyde, and the Canterbury Tales. Fall, even-numbered years.
- ENG 412: SHAKESPEARE: COMEDIES AND HISTORIES** 3 s.h.
Provides study and discussion of problems of style, characterization, and motivation in Shakespeare's experimental and maturing comedies, chronicle and Roman plays, and tragedies. Plays to be selected from the first two periods of Shakespeare's creative productions. Fall, annually.
- ENG 413: SHAKESPEARE: TRAGEDIES AND ROMANCES** 3 s.h.
Provides study and discussion of problems of style, characterization, and motivation in Shakespeare's mature comedies, Roman plays, tragedies, and romances. Plays to be selected from the last two periods of Shakespeare's creative production. Spring, annually.
- ENG 457: INTRODUCTION TO LINGUISTICS** 3 s.h.
Presents key concepts and basic analytical procedures common to many contemporary linguistic theories. Areas covered in detail include phonetics and phonology, morphology, and syntax. Attention is paid to the integration of these sub-systems in the overall design of a generative grammar. Prerequisite: ENG 262. Fall, annually.
- ENG 458: HISTORY OF THE ENGLISH LANGUAGE** 3 s.h.
Provides a study of the history of the language, including its origins and changes in structure, usage, pronunciation, spelling, vocabulary, and meaning. Intensive readings in Old and Middle English. Spring, even-numbered years.
- ENG 459: LANGUAGE ACQUISITION ACROSS CULTURES** 3 s.h.
Introduces current research in first and second language acquisition with an emphasis on the preparation of classroom teachers and other professionals to work with children/adults coming from homes in which languages other than English are spoken. Prerequisite: ENG 262 recommended but not required.
- ENG 482: COMPOSITION: THEORY AND PRACTICE** 3 s.h.
Provides a systematic study of theory, and practice in the teaching of composition, conducted through workshop methods. The course requires extensive writing and a major written project. Prerequisites: secondary education majors in English must have completed ENG 111, 200, or 301 and have taken or be taking their methods course; others by permission of the instructor. Fall, annually.
- ENG 501: INTRODUCTION TO ENGLISH STUDIES** 1 s.h.
An introduction to the strategies of graduate and professional discourse in English studies. The course also includes an introduction to bibliographic and library resources in the field. One hour weekly, in the first semester of graduate work, by arrangement with the director of graduate studies.
- ENG 509: SEMINAR IN LITERARY THEORY** 3 s.h.
A seminar on general and/or selected theoretical issues implicit in the reading of literary texts. Depending upon the instructor, the course may cover broad matters of interpretation (authorial intention, the reader's share, intertextuality), focus on more specific theories of reading (reader-response, phenomenology, post-structuralism), or consider the conceptual foundations of certain literary structures (narrative, genre, tropes).
- ENG 510: SEMINAR IN ENGLISH LITERATURE** 3 s.h.
This course provides students with critical strategies to apply to specific periods, figures, or problems in English literature. This course may be taken more than once if the course content is different.
- ENG 511: SEMINAR IN AMERICAN LITERATURE** 3 s.h.
This course provides students with critical strategies to apply to specific periods, figures, or problems in American literature. This course may be taken more than once if the course content is different.
- ENG 512: SEMINAR IN LITERARY STUDIES** 3 s.h.
This seminar encompasses topics that combine English, American, and other literatures in a critical discourse. Topics may include ethnic, non-canonical, and comparative literature. Studies in the novel, drama, and the satire may be subjects of this seminar. This course may be taken more than once if the course content is different.
- ENG 515: SEMINAR IN FILM** 3 s.h.
Film language views movies as a discourse medium, using a variety of formal structures: montage, mise-en-scene, and narrative and non-narrative patterns. These grammatical and rhetorical elements will be studied as they structure representative movie texts. Specific theories of film will also be reviewed.
- ENG 520: SEMINAR IN WRITING: THEORY AND RESEARCH** 3 s.h.
Seminar in Writing explores important movements in rhetorical theory and recent trends in research as conceptually applied to writing, education, and related fields. Students study major theories about the nature of writing and scientific inquiry into it.

- ENG 521: SEMINAR IN COMPOSITION STUDIES 3 s.h.
Seminar in Composition Studies, which builds on the classroom practices presented in ENG 520, examines recent issues and innovations in writing with emphasis on the subspecialties of writing. Topics may include: the composing process, computers in composition, evaluation, writing across the curriculum, or critical thinking and writing.
- ENG 522: PRACTICUM IN COLLEGE TEACHING 3 s.h.
This course introduces prospective composition instructors to the principles and practices of teaching at the college or university levels and provides a forum for discussing those ideas. Students will observe composition classes, draft syllabi, and develop, sequence, and test writing assignments. Emphasis is placed on diagnosing writing weaknesses, responding to writing, and evaluating it.
- ENG 523: INTERNSHIP IN WRITING 3 s.h.
Interns receive tutorial, promotional, educational, organizational, or technical writing experience in university or other professional settings. This course provides for writing and editing tasks appropriate to the unit or organization. Some administrative and research work may be involved. (No more than 6 credits may be taken from ENG 523 and ENG 522 combined.)
- ENG 530: SEMINAR IN LINGUISTICS 3 s.h.
A study of the philosophical basis of present day generative-transformational theory and its relationship to language acquisition and semantics.
- ENG 531: SEMINAR IN HISTORY OF THE ENGLISH LANGUAGE 3 s.h.
Advanced study in historical linguistics. The development of the English language is reviewed toward supporting study and analysis of original historical texts in the English language. Students may elect a general approach or focus on a specific historical period.
- ENG 534: WORKSHOPS IN ENGLISH 1-3 s.h.
- ENG 540: INDEPENDENT STUDY 1-3 s.h.

Master of Science in Library Science

College of Education and Human Services

Department of Library Science

Graduate Faculty

Professors: A. Gamaluddin, B. Vavrek; **Associate Professors:** W. Buchanan, J. Maccaferri; **Assistant Professor:** A. Miller

Mission

The Department of Library Science of Clarion University of Pennsylvania is dedicated to educating individuals in the competencies needed for traditional and emerging careers in librarianship. The department views librarianship as the management and dissemination of information and knowledge to meet the needs of a global society. Within this context, the department is committed to assisting professional librarians, their staffs, and their organizations, particularly those who serve rural populations. The department contributes to the profession through research, publications, and the professional leadership of its faculty.

Goals

To achieve its mission, the department:

- offers programs at the undergraduate level and professional degree programs at the graduate level;
- develops and presents continuing education programs;
- provides programs on campus and through distance education;
- promotes faculty development; and
- fosters a collegial environment.

Graduate Program Objectives

The graduate program in library science provides professional study encompassing principles and techniques common to all types of libraries and information centers with the opportunity for advanced work in areas of special interest. The curriculum reflects today's applications of information technology in libraries and information centers.

The master's program at Clarion University was initiated in 1967 and has the distinction of being the first graduate library science program offered within the State System of Higher Education. The program has been accredited by the American Library Association since 1976.

M.S.L.S. Admission Requirements

Eligibility

Applicants for admission to the Master of Science in Library Science degree program must meet College of Graduate Studies admission requirements with the following additions:

1. an overall quality-point average for the baccalaureate degree of at least 3.00 on a 4.00 scale; *or*
2. a 3.00 quality-point average for the last 60 credits of the baccalaureate degree with an overall quality-point average of at least 2.75; *or*
3. a 2.75 to 2.99 overall quality-point average for the baccalaureate degree with a score of at least 50 on the Miller Analogies Test or a combined score of at least 1,000 on the quantitative and verbal sections of the Graduate Record Examination; *or*
4. a graduate degree in another discipline with an overall quality-point average of at least 3.00 and an overall undergraduate quality-point average of at least 2.75.

International students are required to achieve a minimum score of 550 on the TOEFL.

Procedure

While students may begin their studies during the fall or spring semesters or during any summer session, the department recommends that they begin during the summer or fall to ensure the ideal sequence of courses. All students must enroll in LS 504: Introduction to the Information Professions as close as possible to the start of their program as the department's course schedule permits. For most students this will be in their first term of study. Students may enroll in no more than twelve semester hours of coursework in a fall or spring semester, no more than three semester hours in a summer pre-session, and no more than six semester hours in a regular summer session, without the permission of the department.

Transfer of Credits/Waiver of Courses

A maximum of six graduate semester hours may be transferred and/or waived in any of the following ways:

- Acceptable graduate credits in library science completed at Clarion University as a non-degree student or at another institution with an ALA-accredited program may be transferred and applied toward the master's degree. The student is responsible for filing an official graduate transcript of any work presented for transfer credit with the chair of the Department of Library Science.
- Graduate credit in related disciplines may be transferred upon prior approval by advisor and chair.
- Students who have had library experience duplicating the subject matter covered in required courses may be permitted to take a qualifying examination to determine whether he or she might waive the course(s) and substitute elective courses. Qualifying examinations may be waived at the chair's discretion.

Degree Requirements

The degree of Master of Science in Library Science is conferred upon the candidate who has met the following requirements:

- The completion of 36 hours of approved graduate study, including six required core courses (LS 500, 501, 502, 504, 550, and 553) and six elective courses.
- The maintenance of a cumulative average of 3.00 or higher. A student who receives a grade of “C” or lower in two or more courses is disqualified as a candidate in the degree program unless special permission to continue is obtained from the dean of the College of Education and Human Services.
- The completion of all degree requirements within a six-year period. Course work over six years old may not be applied toward the degree.

Master of Science in Library Science Degree with Pennsylvania School Library Media Certification

A student wishing to obtain Pennsylvania School Library Media Certification, K—12, must hold a valid teaching certificate; complete 36 semester hours of an approved curriculum in library science; and complete three semester hours of internship in a school library media center.

Required courses for the Master of Science in Library Science degree with Pennsylvania School Library Media Certification, K—12, include: LS 500, 501, 502, 504, 550, 553, 555/577, 565, 583, 459g, LS 490g, and either LS 540/568/571 or an advanced technology course (e.g., LS 560/573/574/575/584/585, or 586).

Continuing Education

Certificate of Advanced Studies

The Certificate of Advanced Studies program is designed to provide the post-master’s student an opportunity to expand and update professional skills and competencies through a structured pattern of continuing education. Study may be either full- or part-time. On a full-time basis, the certificate may be completed in two semesters. Requirements include a written statement of personal/professional goals, completion of a program of 24 graduate credits within a four-year period, and maintenance of a 3.00 (B) quality-point average.

Documentation required for admission includes a goals statement, an official transcript from the school which granted the master’s degree in library science, completed university application for admission form and recommendation forms, and the \$25 application fee. Further information is available from the College of Graduate Studies.

Non-Degree Status

Individuals not interested in a formal degree or certificate program may enroll in courses as a non-degree student; however, no more than six credits of work completed as a non-degree student may later be transferred to a degree or certificate program. Students must have a baccalaureate degree from a regionally accredited institution, submit a completed application form and official transcripts, and pay the \$25 application fee. Further information is available from the College of Graduate Studies.

Graduate Assistantships and Scholarships

The Department of Library Science has available a number of assistantships for both entering and continuing students. Continuing students may compete for several department scholarships. For more information concerning assistantships, refer to the general information section of this catalog; for information concerning library science scholarships, contact the Department of Library Science. Applications for graduate assistantships are included in the packet of information sent to all prospective students.

Additional information on financial aid may be obtained from the booklet, *Financial Assistance for Library and Information Studies*, published by the American Library Association Committee on Education.

Advisement

Students are assigned a faculty advisor upon admission to the program. Students must discuss course scheduling with their advisor in order to register for classes each semester. At any time, a student may select a different advisor having greater expertise and experience in the student's area of interest. In addition to assisting students in developing a program of study, faculty advisors work with students to develop career objectives, prepare resumé's, and plan a job search.

Internship

LS 570: Internship in Librarianship enables a student to anticipate the librarian's professional role and to gain related experience. The major purpose of this course is to familiarize the student with practical problems in the field by providing laboratory experience in the professional atmosphere of a cooperating library or information center.

Each student's internship is an individual experience. The student identifies a prospective internship site and cooperating librarian and proposes a set of objectives he or she plans to achieve through the internship. These objectives, stated behaviorally, are discussed by the student, the faculty member responsible for the internship program, and the cooperating librarian. Once these objectives are finalized, the student is evaluated on the degree to which the objectives have been achieved and the process leading to the realization of the objectives. There is a periodic review of each student's objectives.

Resources and Facilities

The Department of Library Science is located in the same building as Carlson Library. The department's suite of offices, classrooms, and laboratories is designed to accommodate a variety of activities for students and faculty within the immediate area. Carlson Library includes an Instructional Materials Center and a collection of juvenile books and curriculum materials for library science study in addition to the usual reference, periodical, and circulating collections. All students receive e-mail accounts and access to the Internet.

Library science classrooms are equipped with appropriate audiovisual equipment, including networked computer display units. Students have ready access to a wide variety of information services, both on-line and CD-ROM, and to standard microcomputer applications in the department's Computer Laboratory. Also housed here are cataloging tools and OCLC workstations.

Center for the Study of Rural Librarianship

The Department of Library Science is dedicated to addressing the information needs of the constituencies of all types of libraries, large and small. The Center for the Study of Rural Librarianship was organized in recognition of this need. "Rural" is defined by the center as a population of 25,000 or fewer people. The center has developed out of a particular concern for library services apart from areas influenced by metropolitan library systems, i.e., the small library in the rural context. Public, school, academic, and special or corporate libraries are all within the interests of the center. Further, library systems or networks which include the small library are included in the center's work.

The activities of the center are varied. They include the annual hosting of a national bookmobile conference along with statewide and regional conferences relating to community economic development and information technology. In addition to continuing education activities, the center conducts ongoing research on a variety of rural-related topics. Additionally, a major project of the center involves an annual investigation of the impact of public libraries in the United States. This latter activity is supported by the H.W. Wilson Foundation.

The center supports a publication program which includes a biannual journal, *Rural Libraries*, the only one that is being published in the area of rural librarianship.

Current Studies in Librarianship

Current Studies in Librarianship is a forum for research by library science students on subjects of general interest to librarians. It is published jointly by the Department of Library Science and the College of Graduate Studies and is indexed in *Library and Information Science Abstracts* (LISA) and *Library Literature*.

Beta Phi Mu International Library Science Honor Society

Beta Phi Mu was founded in August 1948 at the University of Illinois by a group of leading librarians and library educators. The motto of the society is "Aliis Inserviendo Consumor," which reflects the dedication librarians must possess toward service to others if books are to become instruments of liberal education.

Beta Phi Mu approved a chapter at Clarion in August 1978. The chapter, Beta Sigma, was installed and the first members were initiated in spring 1980. Membership in this international society is granted to a graduate of a library school program accredited by the American Library Association who has earned a 3.75 scholastic average on a 4.00 scale and has been recommended by the library school faculty. The faculty recommendation attests to the candidate's professional competence and promise. At present, the local chapter is permitted to grant membership to only 25 percent of the graduating class each year.

Opportunities for Service

American Library Association Student Chapter

The American Library Association Student Chapter was established in 1992 and formally recognized by the Student Senate in 1993. It provides both undergraduate and graduate students with opportunities for professional education and service beyond those provided by course work. Chapter activities include round table discussions, field trips, participation in community projects, and sponsorship of colloquium speakers.

Special Libraries Association Student Chapter

The Special Libraries Association Student Chapter was established in 1996 and officially recognized by the association in the same year. Special libraries and information centers are found in businesses, government agencies, museums, hospitals, and professional associations. The student chapter offers students opportunities to learn more about special librarianship by visiting special libraries, by sponsoring speakers, and by participating in service projects in local libraries.

Department Governance

Students are encouraged to participate in developing and evaluating department policies and procedures through membership on department and university committees.

Career Outlook

Prospects for the future are extremely positive for well-prepared new graduates guided by creative faculty advisors. Employment opportunities vary according to the type of library, educational qualifications, and the areas of specialization of the individual preparing to enter the profession. The librarian who is flexible with respect to geographic area and willing to meet the challenge of serving special groups will have especially good opportunities for employment.

Placement Service

Clarion University of Pennsylvania and the Department of Library Science assist both students and alumni in obtaining positions in libraries and related agencies by acting as a clearinghouse for current job information and by posting vacancy announcements. Official academic transcripts, however, must be requested by the student from the university registrar. The Department of Library Science publishes a comprehensive position listing on the World Wide Web.

The Office of Career Services provides assistance to all graduates by maintaining a file of vacancy notices received from public schools, government agencies, business, and industry. It also provides assistance in preparing resumé and in developing interview and communication skills.

Library Science Courses

LS 432: COLLOQUIUM 0 s.h.
Lectures, discussions, multi-media presentations given by guest speakers, faculty, and others. Reinforces concepts presented in course studies and provides the student with insight into the trends and issues of the profession.

LS 459g: MEDIA, METHODS, AND THE CURRICULUM 3 s.h.
Planning for the effective use of school library media services in cooperation with the instructional staff. School library media philosophies and educational objectives will be examined. Students will learn the process of developing a library media program and examine the librarian's role in designing curriculum, in developing teaching-learning strategies, and in working with teachers, students, and administrators. This course includes a three-week practical experience in a school library media center. Prerequisites: Valid teaching certificate or the following courses: LS 555 or 577, 583, 490, and 565.

LS 490g: LIBRARY MATERIALS AND SERVICES FOR SPECIAL AUDIENCES 3 s.h.
An opportunity for students to explore the nature and needs of special groups of library users in order to develop collections of materials and to design programs of services to accommodate those needs. Special needs in all types of library settings—academic, public, school, and special—are examined in particular; the unique characteristics and instructional needs of exceptional learners who use the school library are explored. Bibliotherapy and other techniques are investigated to determine their validity for the exceptional learner.

- LS 500: INFORMATION SOURCES AND SERVICES** 3 s.h.
Philosophy and techniques of information services in libraries, with the sources, tools, and technology essential to the reference process. Specific reference problems and research studies, the reference interview, bibliographic instruction, and search strategies are considered. Recommended as an elective for nonlibrary science students in other graduate programs.
- LS 501: DEVELOPING LIBRARY COLLECTIONS** 3 s.h.
Acquiring familiarity with basic bibliographical tools, current reviewing media, and acquisitions procedures. Establishment of policies and criteria for the selection and evaluation of book and nonbook materials.
- LS 502: CATALOGING AND CLASSIFICATION** 3 s.h.
Introduction to the principles and techniques of organizing information with special reference to contemporary library practice. Students are introduced to descriptive cataloging using *Anglo-American Cataloguing Rules*, alphabetical indexing using *Library of Congress Subject Headings* and *Sears List of Subject Headings*, and systematic indexing using the *Dewey Decimal Classification* and the *Library of Congress Classification*. The structure and use of manual and automated catalogs and indexes are considered.
- LS 504: INTRODUCTION TO THE INFORMATION PROFESSIONS** 3 s.h.
This course introduces students to the nature of information and its role in society, the philosophical, ethical, and historical foundations of the information professions, major professional organizations, and the legal, political, and social issues confronting today's information professionals. The identification and use of print and electronic information resources pertinent to library and information science are also covered.
- LS 540: MULTICULTURAL LIBRARY SOURCES AND SERVICES** 3 s.h.
An opportunity for students to explore, understand, and develop library resources and services for multicultural, diverse, and other special populations. Library resources and services are examined particularly as they relate to ethnicity, race, gender preference, and disability.
- LS 550: INTRODUCTION TO RESEARCH IN LIBRARY SCIENCE** 3 s.h.
Study of the scientific methods of planning, conducting, and reporting investigation and research in library science, including specific problems in library service. Critical analysis of research in professional literature. Designed to develop skill in interpreting research results.
- LS 551: STORYTELLING** 3 s.h.
Study of the heritage and art of traditional storytelling, the literary sources for contemporary storytelling, and the techniques for preparing and presenting story programs. Consideration will be given to multi-media storytelling, including puppetry. Students will present stories in class and in the community. Prerequisite: LS 577 (or equivalent). Open to M.Ed. candidates by permission from the instructor.
- LS 552: ADVANCED CATALOGING AND CLASSIFICATION** 3 s.h.
In-depth exploration of the issues involved in organizing collections with special reference to authority control, the cataloging and classification of nonbook materials (including electronic resources), and the use of *Library of Congress Subject Headings* and the *Library of Congress Classification*. Prerequisite: LS 502.
- LS 553: MANAGEMENT OF LIBRARIES** 3 s.h.
A study of organizational structure, management styles, budgeting, human resources management, and the impact of technological advances. Architectural design, with emphasis on the relationship of physical structure to library function, is discussed. Standards for evaluating library services are studied in depth.
- LS 555: HISTORY OF CHILDREN'S LITERATURE** 3 s.h.
Survey of the history and development of children's literature from the Anglo-Saxon period in England through the nineteenth century. Biennially.
- LS 556: BIBLIOGRAPHY OF THE SCIENCES** 3 s.h.
Survey of the literature and practice of librarianship in major areas of the sciences, including biology, chemistry, engineering, geology, mathematics, medicine, and physics. Prerequisite: LS 500.
- LS 557: BIBLIOGRAPHY OF THE SOCIAL SCIENCES** 3 s.h.
Survey of the literature and practice of librarianship in major areas of the social sciences, including anthropology, business, economics, education, geography, history, political science, and psychology. Prerequisite: LS 500.
- LS 558: BIBLIOGRAPHY OF THE HUMANITIES** 3 s.h.
Survey of the literature and practice of librarianship in the humanities, including art, literature, music, philosophy, religion. Prerequisite: LS 500.
- LS 560: LIBRARIES AND PUBLIC ACCESS COMPUTING** 3 s.h.
Analysis of the present and future roles of academic, school, and public libraries in the emerging environment of public access computing. Enabling librarians to take a leadership role in public access computing is a major goal of this course.

- LS 562: GOVERNMENT DOCUMENTS 3 s.h.**
Study and evaluation of selected federal, state, and municipal documents, foreign government publications, and the United Nations. The nature of documents, their reference and research value; the techniques of acquisition, organization, and bibliographic control; on-line commercial and government data bases. Prerequisites: LS 500, 502.
- LS 565: SELECTION, UTILIZATION, AND PRODUCTION OF NONBOOK RESOURCES 3 s.h.**
Selection, acquisition, organization, storage, and maintenance of nonbook materials of all formats in libraries and system-wide centers are studied. Sample materials are previewed, evaluated, and used for programming and instruction.
- LS 568: HISTORY OF BOOKS AND PRINTING 3 s.h.**
Study of the evolution of the printed book through a survey of the origin of recorded communication; history of writing materials; study of manuscript production, typography, type design, illustration, bookbinding, book production, and copyright from the earliest times to the present.
- LS 569: TECHNICAL SERVICES 3 s.h.**
Introduction to the historical development and current trends of technical services; management and systems involved in the operation/automation of a technical services department (acquisitions, serials control, charging systems, cataloging, and classification). Prerequisites: LS 501, 502.
- LS 570: INTERNSHIP IN LIBRARIANSHIP 3 or 6 s.h.**
Provides an advanced preprofessional experience in the atmosphere of a cooperating library or information center in which the student is able to apply and evaluate the theory and practice learned in the classroom. Students participate in seminar meetings, prepare an evaluative paper, and are observed and evaluated by both the site supervisor and the internship coordinator. Prerequisites: four core and four elective courses pertinent to the internship, permission of the student's advisor, the internship coordinator, and the department chair.
- LS 571: INTERNATIONAL LIBRARIANSHIP 3 s.h.**
Study of libraries and librarianship in selected countries, with emphasis on library education as related to culture, technological advances, and global politics. Considers the role of professional organizations and the impact of worldwide library education.
- LS 573: LIBRARY AUTOMATION 3 s.h.**
Survey of library automation; the application of computers to library technical and administrative processes. The state of the art; case studies of automation projects; systems analysis; design of library automation projects.
- LS 574: DATABASE SEARCHING 3 s.h.**
General introduction to interactive database searching, including database producers, search system vendors, management of search services, search strategy, Boolean searching, structure and indexing of computer stored files. The course includes historical and background information. Greatest emphasis is on becoming a proficient searcher.
- LS 575: INFORMATION SYSTEMS 3 s.h.**
Seminar approach is used to allow students to examine topics of interest in the information systems field, culminating in the preparation of a term project such as a literature survey, the design of a computer program, or other topics appropriate to the course of studies.
- LS 576: SPECIAL TOPIC IN LIBRARIANSHIP 3 s.h.**
In-depth discussion, study, and research of a topic related to the role of the library in responding to social issues, service to special groups, or problem areas. The following represent typical offerings: (1) Bibliotherapy; (2) Microcomputers in Libraries; (3) Library Services for the Gifted; (4) Media and Minorities; (5) Oral History; (6) Connectivity: Understanding the Information Infrastructure. Prerequisites: LS 500, 501, 502, equivalent or permission of the instructor. A maximum of six credit hours may be applied toward graduation.
- LS 577: LIBRARIES, LITERATURE, AND THE CHILD 3 s.h.**
Opportunity for graduate students to investigate (1) the nature of children's literature; (2) the utilization of children's literature in school, public and special library settings; (3) trends in children's literature as a part of the total body of literature and as an educational force; and (4) current research in the field. Biennially.
- LS 578: THE RURAL PUBLIC LIBRARY IN AN URBAN ENVIRONMENT 3 s.h.**
Introduction to the public library in the United States, with special concern for the small rural library. Particular emphasis on the problems and limitations of such libraries and approaches for overcoming them.
- LS 580: LIBRARY MARKETING AND THE COMMUNITY 3 s.h.**
Addresses the following aspects of successful community analysis and marketing of library services: the current and potential library users; their specific informational needs; and how the library can provide adequate service.

- LS 581: SEMINAR IN PROBLEMS OF RURAL LIBRARY SERVICES 3 s.h.**
Problem-analysis approach to providing services to rural populations by school, public, academic, and other libraries. Examines networking, technology, funding, governmental regulations, etc., as they relate to rural library services. Prerequisites: LS 550, 553.
- LS 582: SERIALS 3 s.h.**
Organization and management of serial publications: includes the format, selection, bibliographic control (manual and mechanized), and preservation techniques; the selection of jobbers and the services they offer. Prerequisites: LS 501, 502.
- LS 583: LIBRARIES, LITERATURE, AND YOUNG ADULTS 3 s.h.**
Examination of the role of the librarian in the selection, evaluation, and use of materials for junior and senior high school age library users. Includes a study of young adult literature and trends affecting its development; techniques for providing reader advisory services; methods of reaching and serving multicultural and special needs audiences; characteristics of the young adult in contemporary society; and development of programs and other means of introducing young adults to books and nonbook media, with special attention to emerging electronic products and services.
- LS 584: AUTOMATED BIBLIOGRAPHIC CONTROL 3 s.h.**
Incorporates theory and practice of automated bibliographic control as applied to acquisitions, cataloging, inter-library loan, and serials control. The course includes an orientation to the major bibliographic utilities, including OCLC, and to selected CD-ROM products. Both the technical and managerial aspects of automated bibliographic control are covered. Prerequisite: LS 502.
- LS 585: MICROCOMPUTERS IN LIBRARIES 3 s.h.**
This course is concerned with the concepts and uses of microcomputer technology, including LANs and CD-ROM LANs, in all types of libraries. Emphasis is on hardware and software applications as they relate to library functions, e.g., data management and information services.
- LS 586: LIBRARIES AND NETWORKING 3 s.h.**
This course is concerned with the principles, concepts, and application of networking activities in all types of libraries. National and international networks are emphasized, particularly the Internet.
- LS 587: INDEXING AND ABSTRACTING 3 s.h.**
In-depth survey and hands-on development of documents surrogates, including annotations, abstracts, precis, and other forms of indexing.
- LS 588: PRESERVATION AND CONSERVATION OF LIBRARY MATERIALS 3 s.h.**
Survey of preservation and conservation activities in libraries and information centers, including disaster planning, environmental factors, treatment of brittle books, library binding, special problems of nonbook materials, and basic conservation treatments. Prerequisites: LS 501 or permission of instructor.
- LS 591: BUSINESS REFERENCE SOURCES AND SERVICES 3 s.h.**
Survey of the literature and services which would be expected in a business library or department of business information. Includes an in-depth examination of major business reference tools, as well as in-depth examination of the special operations, organization, and management of business libraries and departments of business information.
- LS 600: INDEPENDENT STUDY/SEMINAR 3 s.h.**
An opportunity for the advanced graduate student to investigate in depth a facet of librarianship and to prepare a scholarly paper or project to report his or her findings. The topic for study must be approved by a faculty committee, and the work must be supervised by a faculty member. Prerequisites: Four core and four elective courses pertinent to the independent study, permission of the student's advisor and the department chair. On demand.

Master of Education Degree in Mathematics

College of Arts and Sciences

Graduate Faculty

Professors: N. Bezak, D. Bhattacharya, B. Freed, S. Gendler, J. Reynolds; **Associate Professors:** K. Bolinger, R. Engle, M. Parker, S. Ringland, G. Rock, T. Wimer; **Assistant Professors:** J. Beal, R. Carbone, D. Hipfel, M. McConnell

Program Objectives

The Master of Education in mathematics is designed to permit in-service teachers of secondary mathematics to obtain permanent certification in mathematics as they further their graduate education in the discipline. Students have an opportunity to meet all the competencies recommended by the Committee on Undergraduate Programs in Mathematics (CUPM) and other certifying agencies while obtaining additional depth in the field and sharpening teaching skills. The program also provides students in related fields an opportunity to work concurrently toward teaching certification and a Master of Education degree.

Admission Requirements

Most students will enter the program with an undergraduate major in mathematics with secondary teaching certification and will have had the following courses or their equivalents:

MATH 300:	Intro. to Advanced Mathematics	3 s.h.
MATH 321:	Intermediate Applied Statistics	3 s.h.
MATH 357:	Modern Geometry	3 s.h.
MATH 370:	Linear Algebra	3 s.h.
MATH 451:	Modern Algebra I	3 s.h.
ED 339:	Methods of Teaching and Evaluating Mathematics	3 s.h.

Students lacking these courses may be required to take them in addition to their degree requirements.

Degree Requirements

To fulfill degree requirements for graduation, students must:

- complete a minimum of 30 semester hours of course work;
- maintain a quality-point average of 3.00/4.00 in all courses presented for the degree; and
- complete a satisfactory research paper or pass a comprehensive examination.

Proficiency Requirements

Proficiency in real analysis demonstrated by completing MATH 471: Real Analysis I (3 semester hours) or by examination. Proficiency in computer programming demonstrated by completing CIS 163: Introduction to Programming and Algorithms I or equivalent course or by experience.

REQUIRED COURSES	12 s.h.
MATH 531: Topics in Geometry	3 s.h.
MATH 532: Statistics	3 s.h.
MATH 533: Foundations of High School Mathematics	3 s.h.
ED 634: Teaching Mathematics	3 s.h.

ELECTIVES IN EDUCATION 3-6 s.h.

At least one of the following:

ED 520: Introduction to Research	3 s.h.
ED 521: Instructional Leadership Skills	3 s.h.
ED 522: Analysis of Teaching	3 s.h.
ED 523: Curriculum Development and Evaluation	3 s.h.
ED 526: Sociology of Education	3 s.h.
ED 537: Strategies—Teaching Elem. School Math	3 s.h.

RELATED ELECTIVES 0-3 s.h.

One course may be chosen from a related area in consultation with the advisor. Related areas include: library science, business, communication, education.

ELECTIVES IN MATHEMATICS 9-15 s.h.

MATH 530: New Mathematics—Elem. Classroom	3 s.h.
MATH 541: Recreational Mathematics	3 s.h.
MATH 553-554: Functions of a Real Variable I, II	6 s.h.
MATH 555: Topology	3 s.h.
MATH 557: Infinite Series	3 s.h.
MATH 559: Complex Variables I	3 s.h.
MATH 561-562: Abstract Algebra I, II	6 s.h.
MATH 563: Linear Algebra	3 s.h.
MATH 569: Mathematical Logic	3 s.h.
MATH 573: Numerical Analysis I	3 s.h.
MATH 575: Algebraic Number Theory I	3 s.h.
MATH 580: Seminar	3 s.h.
MATH 599: Individual Research	1—3 s.h.

Assistantships

A limited number of assistantships may be available. These are awarded only to full-time students. Applicants for assistantships must complete the regular admission procedure in order to be considered for an appointment and then file a letter of application with the chair of the Department of Mathematics. Applications should be submitted by April 15.

Advisement

Upon admission to the M.Ed. program in mathematics, students are assigned advisors who will help them plan their programs. It is the responsibility of students, with the help of their advisors, to meet all requirements for the degree.

Facilities

Facilities include a conference room and study areas on the ground floor of Peirce Science Center. Students have access to the VAX computer directly and through on-line terminals. In addition, hands-on use of Macintosh microcomputers in our computer laboratory is encouraged.

Mathematics Courses

MATH 421: MATHEMATICAL STATISTICS I	3 s.h.
Basic concepts of elementary probability; probability in finite spaces; conditional probability; independent trials; sophisticated counting; probability in relation to random variables. Prerequisites: MATH 272 and 300.	

- MATH 422: MATHEMATICAL STATISTICS II** 3 s.h.
Mathematical expectation; discrete and continuous random variables; probability densities; sampling distributions; point estimations; interval estimations; tests of hypotheses, regression and correlation; analysis of variation; moment-generating functions. Prerequisite: MATH 421.
- MATH 451, 452: MODERN ALGEBRA I, II** 3 s.h. each
An introduction to groups, rings, integral domains, and fields. Prerequisite: MATH 300. Fall and spring respectively.
- MATH 454: THEORY OF NUMBERS** 3 s.h.
Factorization, congruence, quadratic reciprocity. Number theoretic functions, diophantine equations, continued fractions. Prerequisite: MATH 300.
- MATH 459: INTRODUCTION TO COMPLEX VARIABLES** 3 s.h.
An introduction to complex numbers, analytic functions, poles, residues, and their applications, including the fundamental theorem of algebra. Prerequisites: MATH 272 and 300.
- MATH 471, 472: INTRODUCTION TO REAL ANALYSIS** 3 s.h.
Limits, continuity, differentiability, integrability, and convergence for functions of a real variable and several variables. Prerequisites: MATH 272 and 300.
- MATH 473: ELEMENTARY TOPOLOGY** 3 s.h.
Topological spaces, metric spaces, compactness, connectedness. Prerequisites: MATH 272 and 300.
- MATH 480: TOPICS** 3 s.h.
This course offers special topics reflecting the interests of students. The specific topic to be covered each term will be announced in advance. Prerequisites: MATH 272 and permission of the instructor.
- MATH 490, 491, 492: SEMINAR I, II, III** 1 s.h. each
Seminar in mathematics. An oral and written presentation is required.
- MATH 530: NEW MATHEMATICS—ELEMENTARY CLASSROOM** 3 s.h.
A seminar on recent topics in mathematics of interest to elementary school teachers.
- MATH 531: TOPICS IN GEOMETRY** 3 s.h.
Topics to be selected from: Properties of Triangles, Properties of Circles, Collinearity and Congruence, Transformational Geometry, Inverse Geometry, Projective Geometry. Prerequisite: MATH 357.
- MATH 532: STATISTICS** 3 s.h.
Probability theory, combinatorial analysis, stochastic independence, binomial, Poisson and normal distributions, Bernoulli Trials, moments generating functions, Markov Chains, time dependent stochastic processes. Prerequisite: MATH 421.
- MATH 533: FOUNDATIONS OF HIGH SCHOOL MATHEMATICS** 3 s.h.
An upper-level development of the basic structure of natural numbers with indications how to present them in the high school classroom. Topics including integers, fractions, real and complex numbers are followed by computational techniques such as Newton Raphson method with computer applications in the secondary class room. Prerequisite: MATH 452.
- MATH 541: RECREATIONAL MATHEMATICS** 3 s.h.
A survey of recreational mathematics through history. Topics include arithmetic, geometric and topological recreations, paradoxes, games, and board puzzles.
- MATH 553-554: FUNCTIONS OF REAL VARIABLE I, II** 3 s.h. each
Fundamental properties of continuous and differentiable functions, uniform convergence, Lebesgue measure and integration. Prerequisite: MATH 472 or its equivalent.
- MATH 555: TOPOLOGY** 3 s.h.
Topological space, connectedness, compactness, continuity, separability, countability axioms, and metric spaces. Prerequisite: MATH 471 or its equivalent.
- MATH 557: INFINITE SERIES** 3 s.h.
Convergent series of constants, power series, summability, uniform convergence, Fourier series. Prerequisite: MATH 471 or its equivalent.
- MATH 559: FUNCTIONS OF A COMPLEX VARIABLE I** 3 s.h.
Analytic functions, Cauchy's integral theorems, Taylor series, analytic continuation, residue theory. Prerequisite: MATH 472 or its equivalent.

MATH 561-562:	ABSTRACT ALGEBRA I, II	3 s.h.
	Theory of groups, rings, ideals, integral domains, and fields. Prerequisite: MATH 452 or its equivalent.	
MATH 563:	LINEAR ALGEBRA	3 s.h.
	Vector spaces, matrices, linear transformations. Prerequisite: MATH 452 or its equivalent.	
MATH 569:	MATHEMATICAL LOGIC	3 s.h.
	An introduction to mathematical logic.	
MATH 573:	NUMERICAL ANALYSIS I	3 s.h.
	Basic properties of round-off error, polynomial approximation, interpolation, numerical differentiation, numerical quadrature, functional approximation, solution of non-linear equations, and simultaneous linear equations. Prerequisite: MATH 460 or its equivalent.	
MATH 575:	ALGEBRAIC NUMBER THEORY I	3 s.h.
	Algebraic number fields, cyclotomic fields, algebraic integers, integral bases and discriminant, arithmetic in algebraic number fields, properties of ideals including the Fundamental Theorem of Ideal Theory. Prerequisite: MATH 452.	
MATH 580:	SEMINAR	3 s.h.
	Selected topics in algebra, analysis, geometry, topology. Prerequisite: One graduate course in the selected area.	
MATH 599:	INDIVIDUAL RESEARCH	1-3 s.h.
	Original mathematical research under the supervision of a member of the graduate faculty of the Department of Mathematics. Prerequisite: Permission of student's graduate committee.	
ED 634:	TEACHING MATHEMATICS	3 s.h.
	Advanced topics in the teaching of mathematics for secondary teachers. Topics may include curriculum design and evaluation, pedagogical models, testing, theory of learning, computers in the classroom, and current research and trends in mathematics education.	

Master of Science Degree in Nursing Family Nurse Practitioner Program

Clarion University/Slippery Rock University

Graduate Faculty

Coordinator: Dr. Joyce Penrose White (SRU); **Professor:** L. Parascenzo (SRU); **Associate Professors:** M. Kavooosi (CU), K. Kellinger (SRU), L. Pritchett (CU), R. Nelson (SRU), B. Stright (CU), J. White (SRU); **Assistant Professors:** L. Benson (CU), N. Falvo (CU), K. Risco (SRU); **Instructor:** C. Masters (CU)

Clarion University and Slippery Rock University jointly offer a Master of Science in Nursing with a family nurse practitioner emphasis. This is a 45 semester hour degree program leading to a master's degree in nursing. The degree program must be completed within six years of the first date of enrollment. Graduates of the program will receive a joint degree granted by both universities.

Courses are offered at both Clarion and Slippery Rock Universities, including sites in Clarion, Oil City, Pittsburgh, Slippery Rock, and Cranberry Township. Students may select one university site for advisement. Students enrolled in the program may utilize the facilities and services of both universities. Information about program requirements and administrative matters are available at both universities. Student advisors are available at both universities.

Program Objectives

Education at the master's level builds on the knowledge and skills individuals obtain in baccalaureate nursing programs. It provides opportunities to apply advanced nursing knowledge and related theories to practice settings. Learning includes research methodology for application to nursing problems and participation in research studies. The educational process provides for role development and related experiences in advanced nursing practice.

The Master of Science in Nursing Program affords advanced practice nurses the opportunity to contribute to research and practice in a technologically dynamic society. The nursing program provides the foundation for a life-long process of personal and professional growth as well as for post-graduate education.

Program Outcomes

Graduates will:

1. Synthesize knowledge from nursing, the sciences, and humanities into advanced nursing practice.
2. Demonstrate critical thinking and diagnostic reasoning in decision-making activities.
3. Use theoretical knowledge and research findings as a foundation for advanced nursing practice.
4. Incorporate professional/legal standards and moral/ethical values into a culturally sensitive practice.
5. Exercise leadership in nursing and health care through advanced clinical practice, nursing education, and administrative activities.

6. Build a professional system that includes interdisciplinary collaboration and teamwork.
7. Participate in legislative and policy-making endeavors that influence health care services and practices.
8. Contribute to nursing knowledge through advanced nursing practice and research.

Admission Requirements

College of Graduate Studies (CU) and College of Graduate Studies and Research (SRU) admission requirements apply and include the following:

- Completed program application materials
- Payment of the \$25 application fee
- Evidence of an earned baccalaureate degree in nursing from an NLN-accredited program
- An undergraduate quality-point average of 2.75 on a 4.00 scale
- Submission of official general Graduate Record Examination (GRE) scores
- One year of recent full-time clinical practice or two years of part-time clinical practice
- Demonstrated ability in typing, using computer keyboard and using a word processing package
- Ability to analyze statistical data

Post-master's registered nurses interested in pursuing education as a family nurse practitioner are eligible for advanced placement in the program. The degree of advanced placement for these students will be evaluated on an individual basis according to credentials, education, and professional experience.

Program Policies

- **Pennsylvania Nursing License Requirement:** All students are required to possess a current Pennsylvania Nursing License.
- Students may transfer up to 12 credits of approved non-clinical course work if courses were taken within five years. Students may not transfer credits from another master's degree.
- Students may challenge up to three credits of course work with permission.
- Students are admitted into the MSN-FNP program after they have met the graduate admission requirements of Clarion University and Slippery Rock University and have been recommended for acceptance by the Admission, Progression, and Graduation Committee. Notification of acceptance is by the Graduate Office of Clarion University (Administrative Site).
- Students are expected to have identified potential preceptors by the time they register for clinical courses in which a preceptor is required.

Degree Requirements

To fulfill degree requirements for graduation, the student must complete 45 semester hours, including required courses with a QPA of 3.00 or better on a 4.00 scale. A research thesis or project is required for graduation.

Performance Requirements

Retention Policy

Students who fail to maintain an overall quality-point average (QPA) of 3.0 are automatically placed on probation. Students placed on probation must achieve satisfactory academic standing within one semester of registration or be removed from the program.

NON-CLINICAL COURSES

Students may earn a grade of “C” in only one non-clinical course without jeopardizing their status in the program. If an additional grade of “C” is earned, the student will be automatically placed on probation. Students placed on probation must repeat a “C” course and earn a grade of “B” or better the next semester the course is offered or be removed from the program. Only two “C” grades can be repeated. Additional grades of “C” will be cause for removal from the program. Students earning a grade below “C” are automatically placed on probation.

CLINICAL COURSES

Students must maintain a “B” average in all clinical courses. If a grade of “C” is earned, the student will be automatically placed on probation. Students placed on probation must repeat that clinical course and earn a grade of “B” or better the next semester that course is offered or be removed from the program. Students can repeat one clinical course. An additional “C” in any clinical course will be cause for removal from the program. Students earning a grade below “C” are automatically placed on probation.

Progression Policy

Students cannot progress in clinical courses while on probation. Students earning a grade below “C” in an MSN course may not progress and must repeat the course at its next offering in order to continue in any clinical course. No course with a letter grade below “C” may count toward fulfillment of requirements for the master’s degree.

Graduation Policy

Students must have an overall quality-point average (QPA) of 3.0 in order to graduate from the program or receive certification as a family nurse practitioner. The maximum time for completion of the degree program is six calendar years.

Advisement

As part of the application process, the candidate must meet with a faculty advisor for an admission interview. Upon admission to the MSN-Family Nurse Practitioner Program the student will be assigned a faculty advisor. The student may select an advisor from either Clarion or Slippery Rock graduate faculty. Before the first course work is begun, the successful applicant should meet with the graduate advisor for orientation and assistance in planning the program of study.

A minimum of nine credits per semester is considered a full load for graduate students. Twelve semester hours is a maximum load. Exceptions may be authorized by the dean of the College of Graduate Studies upon recommendation by the graduate faculty of Clarion University and Slippery Rock University acting upon a written petition by the student.

It is the candidate's responsibility to file, with the aid of his or her advisor, an Application for Graduation prior to the published deadline during the semester in which he or she intends to graduate.

Courses

The following courses are required of all students graduating with a Master of Science in Nursing—Family Nurse Practitioner Program:

NURS 601:	Advanced Concepts in Pathophysiology	3 s.h.
NURS 602:	Pharmacologic Applications	3 s.h.
NURS 605:	Evolution of Nursing Theory	3 s.h.
NURS 610:	Advanced Concepts in Nursing Research	3 s.h.
NURS 614:	Nursing Intervention with Families	3 s.h.
NURS 615:	Advanced Health Assessment	3 s.h.
NURS 620:	Clinical Decision Making I	3 s.h.
NURS 630:	Clinical Decision Making II	5 s.h.
NURS 631:	Clinical Decision Making II: Role Seminar	1 s.h.
NURS 640:	Clinical Decision Making III	5 s.h.
NURS 641:	Clinical Decision Making III: Role Seminar	1 s.h.
NURS 645:	Nursing and Public Policy	3 s.h.
NURS 750:	Internship	6 s.h.
NURS 800:	Thesis/Project	3 s.h.

Total: 45 semester hours

NURS 601: Advanced Concepts in Pathophysiology is a prerequisite to NURS 602: Pharmacologic Applications and NURS 615: Advanced Health Assessment. NURS 605: Evolution of Nursing Theory is a prerequisite to NURS 610: Advanced Concepts in Nursing Research.

Curriculum

COURSE SEQUENCE

FULL-TIME

Fall—Year 1	Spring—Year 1	Summer—Year 1
615 Adv. Health Assessment 601 Adv. Con. Pathophysiology 614 Nursing Int. with Families 605 Evol. of Nursing Theory	610 Adv. Con.in Research 602 Pharmacologic App 645 Nursing & Public Policy 620 Clinical Decision I	Thesis/Project
Fall—Year 2	Spring—Year 2	Summer—Year 2
630/631 Clinical Decision II	640/641 Clin. Decision III	Internship

PART-TIME

Fall—Year 1	Spring—Year 1	Summer—Year 1
614 Nursing Int. with Families 601 Adv. Con. Pathophysiology	645 Nursing & Public Policy 602 Pharmacologic App	
Fall—Year 2	Spring—Year 2	Summer—Year 2
615 Adv. Health Assessment 605 Evol. of Nursing Theory	610 Adv. Con. in Research 620 Clinical Decision I	Thesis/Project
Fall—Year 3	Spring—Year 3	Summer—Year 3
630/631 Clinical Decision II	640/641 Clin. Decision III	Internship

- NURS 631: CLINICAL DECISION MAKING II: ROLE SEMINAR 1 s.h.**
This seminar, a controlled environment for deliberation on clinical situations encountered, explores the role of the practitioner in advanced nursing practice. It provides opportunities for discussion of alternative approaches to diagnosis, advanced nursing, medical, or collaborative management. The seminar will include the discussion of clinical based research questions, client presentations, and effective treatment interventions. Two laboratory hours weekly. This course must be taken concurrently with NURS 630. Prerequisites: Minimum grade of "B" in NURS 614, 615, and 620. Spring, annually.
- NURS 640: CLINICAL DECISION MAKING III 5 s.h.**
This course focuses upon adults (young, middle-aged, and older) in regard to health promotion, wellness maintenance, disease prevention, early detection of problems, prompt treatment of acute illness, and support for management and self care during chronic conditions. All dimensions of development and the total health of the adult and family are considered. Course theory seeks to expand the practitioner's base of knowledge and understanding while clinical practicum provides an opportunity for the application of learning and the enhancement of decision-making skills. Opportunity is provided for the development of skill in selected therapeutic interventions related to health care of the adult from birth to youth through old age. The course provides for expansion of knowledge for application in working with clients, families, and colleagues in clinical practice. Collaboration with other health care providers is fostered. This course must be taken concurrently with NURS 641. Prerequisites: Minimum grade of "B" in NURS 614, 615, and 620. Fall, annually.
- NURS 641: CLINICAL DECISION MAKING III: ROLE SEMINAR 1 s.h.**
This seminar, a controlled environment for deliberation on clinical situations encountered, explores the role of the practitioner in advanced nursing practice. It provides opportunities for discussion of alternative approaches to diagnosis, advanced nursing, medical, or collaborative management. The seminar will include the discussion of clinical based research questions, client presentations, and effective treatment interventions. Two laboratory hours weekly. This course must be taken concurrently with NURS 640. Prerequisites: Minimum grade of "B" in NURS 614, 615, and 620. Fall, annually.
- NURS 645: NURSING AND PUBLIC POLICY 3 s.h.**
This course examines the implications of health care financing, structuring, labor market trends, and current health care reform proposals for nursing in general and for advanced practice nursing specifically. Additionally, the student will be stimulated to appreciate the critical need for nurses to engage in activities, individually and as members of professional organizations, that will enhance the position of nursing in influencing health care policy and legislation at all levels—local, state, and federal. A pervasive theme throughout the course is the ultimate goal of improving the health care of our citizens. Fall, annually.
- NURS 750: INTERNSHIP 6 s.h.**
Internship is a supervised clinical experience which provides the opportunity to gain competency in the multiple roles of nurse practitioner practice, including managing clients' health/illness status, monitoring and ensuring quality, organizing work, performing teaching/coaching functions, and protecting and enhancing human dignity. Students function under the guidance of certified nurse practitioners or licensed physicians who have been approved by the department as preceptors. Eighteen hours of clinical experience weekly. Prerequisites include all program course work, excluding thesis. Spring, annually.
- NURS 800: THESIS/PROJECT 3 s.h.**
Scholarly research paper based on an innovative and/or creative study pertinent to nursing or a related area.

Master of Education Degree in Science Education

College of Arts and Sciences

Department of Biology

Graduate Faculty

Professors: W. Barnes, W. Belzer, P. Dalby, K. Eggleton, R. McPherson, T. Morrow, F. Vento, E. Zielinski; **Associate Professors:** J. Ernissee, S. Harris, D. Howes, I. Rhode, D. Smith, C. Williams; **Assistant Professors:** W. Jetkiewicz, S. Shulik

Program Objectives

Clarion University has a strong commitment to help teachers and schools improve science experiences for their students. Our courses in science education are exciting, useful, and relevant to elementary, middle, junior high, and senior high school teachers. They are taught in the same style of inquiry and investigation that we encourage teachers to use in their own classrooms. By enrolling in the science education program, teachers can learn to teach investigatively in their own classrooms, to make and use science materials and equipment, to design science curricula, to incorporate the broad principles of science into their own classrooms, and provide leadership in science education.

The graduate program in science education requires a minimum of 30 semester hours of approved course work for completion. Required courses have been kept to a minimum to allow maximum flexibility in tailoring course plans to individual needs and career aspirations. The program is designed to serve in-service teachers of science, as well as prepare graduates to assume positions of science leadership or to pursue doctoral programs in science education.

One track of the program serves self-contained elementary classroom teachers who wish to improve their skills as science teachers. Several courses are available which combine science content and processes, and teachers learn how to apply them to their own classrooms.

Another track serves middle, junior high, and senior high school science teachers. They may use the program to learn about and develop new curricula and teaching methods for their own classrooms and schools. In addition, a large number of graduate science courses are available for those who wish to increase their strength in various content areas.

Other tracks exist for students seeking positions as environmental educators, students seeking science leadership positions upon completion of the master's degree, or students wishing to enter higher education after completing the graduate program here at Clarion University. Graduates of Clarion's Master of Education in science education program have entered Ph.D. programs in science education at such schools as the University of Georgia, Ohio State University, Pennsylvania State University, the University of Colorado, and others. Graduates of the Clarion program who have continued their education have been most successful and are filling teaching and research positions at colleges and universities across the country.

Admission Requirements

College of Graduate Studies admission requirements apply with the following additions:

- The applicant should have an undergraduate major in elementary education or secondary education with certification in either of those areas. If the applicant does not meet this requirement, the graduate faculty of the department shall determine existing deficiencies and how they may be met.
- Admission to provisional status may be granted at the discretion of the faculty if the applicant's QPA is less than 2.75/4.00. Regular status may be granted upon completion of 12 semester hours of graduate study with a minimum of 3.00/4.00 average.

Degree Requirements

To fulfill the degree requirements for graduation the student must:

- Complete a planned program of 30 semester hours or more with a QPA of 3.00/4.00 or better.
- Pass a written comprehensive examination after completing a minimum of 21 credits.
- Students must complete a planned program, including a minimum of 30 credits selected from the following two general areas:

SCIENCE EDUCATION

With approval of the candidate's advisor, students must elect a minimum of 18 hours of graduate science education courses which should include SCED 502, SCED 538, SCED 540, and SCED 556.

GENERAL ELECTIVES

With approval of the candidate's committee, students may elect 12 hours of graduate courses from the following areas:

- Science Education
- Reading
- Biology
- Special Education
- Education
- Communication
- Mathematics
- Research (0-6 s.h.)

Placement

The M.Ed. in science education is designed primarily to serve teachers such as elementary teachers in self-contained classrooms, elementary, junior high and senior high science teachers, and science supervisors who already have positions. Some use the program to advance to new positions, such as science leaders or computer specialists. Others use the program as a stepping stone to a higher degree. Among those who utilized the degree to seek a position, placement has been excellent.

Graduate Assistantships

Graduate assistants in science education serve in a variety of roles. They may prepare for and assist in teaching undergraduate classes, direct undergraduate assistants in the Center for Science Education, carry out library research for center projects, and assist in-service programs. Assistantships offer an excellent opportunity to obtain practical experience while completing most requirements for a master's degree in one calendar year. Some in-service teachers utilize a sabbatical leave for this purpose.

All applicants for graduate assistantships must complete the regular admission procedure in order to be considered for an appointment and, following admission, file an application for the graduate assistant position with the chair of the Department of Biology. Applicants for graduate assistantships should submit completed applications by late April for consideration the following fall.

Environmental Education Certification

Clarion University offers a program leading to certification in environmental education. Students in the program learn through courses which are taught using discovery, investigation, and hands-on experiences carried out primarily in the outdoors. The program focuses on the major concepts of ecology and those concepts of the social sciences which apply to the environment. Students also become well-versed in the major environmental curricula which are available.

The program is designed to certify elementary and secondary teachers in environmental education. Individuals completing the program are certified to teach environmental education to students from K—12.

Advisement

Prior to beginning course work all applicants are interviewed by a member of the science education graduate faculty of the Department of Biology. The chair of the Science Education Graduate Committee will advise those students who have not yet been admitted and who do not have an advisor.

Cooperative Doctoral Program

Clarion University and Penn State University are cooperating to offer a Ph.D. or D.Ed. in curriculum and instruction at Penn State with an emphasis in science education. The program has two major components. First, it allows up to 45 credit hours of approved graduate work completed at Clarion University in the science education master's degree program, or beyond that degree, to be applied toward a 90 credit-hour minimum program leading to the doctorate in science education at Penn State. Secondly, research may be conducted at Clarion University.

Faculty members at Clarion University hold adjunct graduate faculty status at Penn State, which enables them to serve on students' doctoral committees. Those faculty are Dr. Kathleen Smith and Dr. Edward Zielinski.

Individuals who want more information about the Cooperative Doctoral Program in Science Education should consult with any of the faculty noted above or write to General Graduate Advisor for Science Education, Biology Department, Clarion University, Clarion, PA 16214-1232, or Graduate Advisor, 165 Chambers Building, Penn State University, University Park, PA 16802.

Physical Facilities

The science education component of the Department of Biology is housed within the department in Peirce Science Center. The William D. Chamberlain Center for Science Education is in Room 220P and functions as a science-education leadership and curriculum center. It contains samples of most modern science curricula, including complete sets of texts and materials for the elementary, middle, junior high school, and senior high school levels and other curriculum materials. The Clarion University Center for Science Education is a resource center for modern K-12 science curricula. The center also func-

tions as a leadership center and a site for conferences and meetings of educators interested in science education.

Peirce Science Center contains laboratories in biology, chemistry, physics, and earth science. A complete planetarium with a 100-seat capacity is attached. The building also contains an animal-aquarium room and a free-standing greenhouse.

The science education program also makes extensive use of McKeever Environmental Learning Center at Sandy Lake, Pennsylvania, and University of Pittsburgh's Pymatuning Laboratory at Lineville, Pennsylvania.

Science Education Courses

SCED 456: ELECTRONICS 4 s.h.

The course is intended for the science teacher who has had little or no previous course work in physics or mathematics. The subjects covered include the fundamental laws of electricity and magnetism, alternating current theory, and the theory and practical application of such devices as ammeters, voltmeters, oscilloscopes, vacuum tubes, transistors, power supplies, amplifiers, and oscillators. Examples of some of these devices will be built in the laboratory, and general procedures for troubleshooting faculty equipment will be illustrated. Summer only, on demand.

SCED 460: SCIENCE CURRICULUM IN THE MIDDLE AND JUNIOR HIGH SCHOOL 3 s.h.

A course designed to acquaint students with modern science instruction strategies and curricula for the junior high/middle school levels. Recent developments in curricular objectives, the unique physiological and psychological qualities of middle level students, science content, teaching strategies, and laboratories are stressed. Fall, annually.

SCED 463: ASTRONOMY: OBSERVATION AND FIELD STUDIES 3 s.h.

This is a course in the experimental tools and methods useful in astronomy. It is not an encyclopaedic survey of astronomy, but concentrates on mastery of important techniques and concepts by a "do-it-yourself" process. It complements courses in descriptive astronomy (ES 200 and 201 and SCED 550) rather than duplicating them, serving much the same purpose as a laboratory in astronomy. The student will build simple telescopes, spectroscopes, and other astronomical instruments.

SCED 466: FIELD PHOTOGRAPHY 3 s.h.

This course is designed to teach the student how to use a modern camera and accessories to photograph subjects in the field. Techniques of close-up, telephoto, and wide-angle photography as well as film development, lighting, use of filters and composition will be included. In addition, the student will have a chance to learn and practice techniques for photographing such subjects as small animals, birds, flowers, large animals, and other subjects. Camera and film to be provided by students. Summer, on demand.

SCED 500: SEMINAR 1-3 s.h.

Current topics in science education. May be repeated (as topics vary) up to nine credits. On demand.

SCED 501: SEMINAR IN SCIENCE MISCONCEPTIONS 3 s.h.

A survey of current literature in the area of science misconceptions. Each student will research a topic and develop interviews and surveys to determine the misconceptions in the area. Fall, odd-numbered years.

SCED 502: INVESTIGATIVE TECHNIQUES AND PROCESS APPROACH TO MODERN SCIENCE CURRICULA 3 s.h.

A course designed to enable elementary, middle, and junior high school teachers to use investigative techniques and the process approach in their own classrooms. Investigative techniques will focus on developing skills in science processes such as observing, classifying, formulating hypotheses, collecting and analyzing data, and designing experiments. Experiences with modern elementary and junior high school science curricula are also included. Two lecture and two lab hours. Fall, annually.

SCED 503: SPECIAL TOPICS OF SCIENCE EDUCATION 1-4 s.h.

Studies of topical material under the guidance of the instructor. Maximum credit allowable toward graduation: 9 credits. Prerequisites: Permission of the instructor and the student's graduate committee. On demand.

SCED 505: INVESTIGATION IN THE LIFE SCIENCES 3 s.h.

A survey of organisms which can be cultured and used in classrooms for investigations. Emphasis will be placed on typical investigations which may be used as models for utilization in the classroom. Students are expected to try out investigations found in current science curricula. Fall, even-numbered years.

SCED 530: FIELD BIOLOGY 3 s.h.

This field course is designed to acquaint elementary, middle, and secondary teachers with the biological environment outside of the classroom as it pertains to plants and animals, their collection, identification, preservation, and ecology. Activities that are applicable to the public school will be provided. Summers, on demand.

- SCED 531: FIELD BOTANY** 3 s.h.
This course is designed to give elementary, middle, and secondary teachers an understanding of the basic aspects of plant science. Emphasis will be placed upon taxonomy, morphology, and life processes of the flowering and nonflowering plants as they relate to work done in elementary and secondary schools. Two lecture and two lab hours. Summer, on demand.
- SCED 532: FIELD ORNITHOLOGY** 3 s.h.
This is primarily a course on the identification and natural history of birds of this area. The primary teaching methods will be illustrated lectures, identification practice via color slides, and field trips. Prerequisite: Basic Biology. Summers, on demand.
- SCED 534: FIELD ZOOLOGY** 3 s.h.
This field course is designed to acquaint the elementary, middle, and secondary teachers with the biological environment outside the classroom as it pertains to animals, their collection, preservation, identification, and ecology. Activities that are applicable to K-12 schools will be provided. Summer, on demand.
- SCED 535: FIELD ECOLOGY** 3 s.h.
The course familiarizes elementary, middle, and secondary teachers with the relationships between plants and animals and their environment. Field work will be emphasized. Frequent field trips are made to areas of particular ecological interest in Northwestern Pennsylvania. Five field, laboratory and lecture hours. On demand.
- SCED 536: CHEMISTRY** 3 s.h.
This lecture-laboratory course is designed to give elementary, middle, and secondary teachers an understanding of basic chemistry. The chemistry of common experience in the public school is explored and the manipulation of chemical apparatus is given special attention. Two laboratory hours. On demand.
- SCED 537: PHYSICS** 3 s.h.
This lecture-laboratory course is designed to give elementary, middle, and secondary teachers an understanding of basic physics. Areas of concentration are the metric system, properties of matter, mechanics, atomic energy, heat, sound, light, magnetism, and electricity. Particular attention will be provided for the application of these areas to public school sciences. Two lecture and two laboratory hours. On demand.
- SCED 538: SCIENCE CURRICULUM** 3 s.h.
This course is designed to come late in the program when the student will have an adequate background for discussions centered around the various approaches to the teaching of science in the elementary, middle, and secondary schools. A study of the principles of curriculum construction, including curriculum origins, goals, objectives, scope and sequence, and evaluation. Spring, annually.
- SCED 539: RESOURCES AND MATERIALS** 3 s.h.
The course gives teachers experience with literature, equipment, and materials used in teaching science in the school. Physical and human resources from national, state, and local communities will be explored. Students will be given ample opportunity to develop and try out teacher-made resources. On demand.
- SCED 540: SUPERVISION OF SCIENCE TEACHING** 3 s.h.
A course designed to prepare science educators (elementary, middle, junior high, and senior high school teachers) for leadership and supervisory roles in the improvement of science curricula and instruction. Spring, even-numbered years.
- SCED 541: SCIENCE SPECIALIST INTERNSHIP IN TEACHING AND SUPERVISION** 1-4 s.h.
This course is designed to give practical experiences in working with teachers and children as a specialist in science teaching, supervising, and assisting in curriculum work. On demand.
- SCED 550: ASTRONOMY** 3 s.h.
This course deals with the planets and their satellites, including the earth and moon, with comets and meteors, with the sun, the stars and clusters of stars, with the interstellar gas and dust, with the Milky Way, and other galaxies that lie beyond the Milky Way. The fundamental concepts of cosmology and the basic principles of light are also included in the course. Three lecture and/or laboratory hours. On demand.
- SCED 551: GEOLOGY** 3 s.h.
A study of rocks, minerals, and geologic formation as they are related to elementary and secondary school science. Past history of the earth as well as present geologic phenomena are discussed. Field trips to areas of geologic interest are taken. Two lecture and two field or laboratory work hours. On demand.
- SCED 552: GEOMORPHOLOGY** 3 s.h.
A study of the interaction between humans and the physical environment as it is related to elementary and secondary school science. On demand.
- SCED 553: METEOROLOGY** 3 s.h.
The fundamentals of weather and weather instruments, maps, records, as well as other activities applicable to elementary and secondary school science are stressed. Three lecture and/or laboratory hours. On demand.

- SCED 554: RECENT ADVANCES IN SCIENCES** 3 s.h.
The course acquaints students with significant developments in the field of science that have taken place in the last two decades. This course assumes a background of information in the fundamentals of the biological and physical sciences. Three lecture hours. On demand.
- SCED 555: HISTORY OF SCIENCE** 3 s.h.
A study of the history of science with accent on the way in which broad scientific principles have developed and those who played a part. On demand.
- SCED 556: ANALYSIS OF RESEARCH IN SCIENCE EDUCATION** 3 s.h.
This course covers topics necessary to analyze, critique, and develop research. Participants will be involved with the study of methodology of research as well as participating in activities in which they critique existing research and develop a research plan. Topics such as developing problems, literature reviews, critical evaluation of research sampling and measurement, design and methodology, and data processing and reporting will be included. Spring, annually.
- SCED 560: SCIENCE CURRICULUM IN THE MIDDLE AND JUNIOR HIGH SCHOOL** 3 s.h.
A course designed to acquaint students with modern science instructional strategies and curricula for the junior high/middle school levels. Recent developments in curricular objectives, the unique physiological and psychological qualities of middle level students, science content, teaching strategies, and laboratories are stressed. Fall, annually.
- SCED 561: MODERN ASTRONOMY** 1 s.h.
This short course covers recent developments in astronomy which are not normally covered in a traditional astronomy course. Topics include stellar, evolution, pulsars, neutron stars, black holes, quasars, and supernovae. Summer, on demand.
- SCED 562: TOPICS IN COSMOLOGY** 1 s.h.
This short course deals in a non-mathematical manner with questions related to the universe as a whole—its beginning, geometry, present state and future development. Topics include the origin of the elements, expansion of the universe, geometry of the universe and observational evidence. Summer, on demand.
- SCED 563: DEMONSTRATIONS AND PROJECTS IN ASTRONOMY** 3 s.h.
Emphasis in this course will be on the selection and preparation of demonstrations and projects in astronomy for teachers of elementary and secondary schools. Summer, on demand.
- SCED 566: ADVANCED FIELD PHOTOGRAPHY** 3 s.h.
This course is designed to teach in-service teachers how to use the advanced aspects of modern SLR 35mm camera and accessories to photograph science subjects in the field. Advanced techniques of close-up, telephoto, and photomacrography, as well as use of advanced depth of field, lighting, and composition will be included. Students also will learn advanced techniques of photographing flora and fauna, geological, astronomical, meteorological, and ecological subjects. Camera and film to be provided by students. Prerequisites: SCED 466 or permission of instructor. Summer, on demand.
- SCED 567: SLIDE PROGRAM DEVELOPMENT** 3 s.h.
This course is normally taken concurrently with SCED 466: Field Photography or SCED 566: Advanced Field Photography. It is designed to be taken by in-service teachers and will teach them how to put together short, single-concept slide programs to be used in their elementary or secondary science classrooms. The Karplus and Generative Models of teaching concepts will be stressed for use with the program. Prerequisites: SCED 466 or SCED 566 or must be taken concurrently, or permission of instructor. Summer, on demand.
- SCED 570: LOCAL SCHOOL CURRICULUM DEVELOPMENT IN SCIENCE** 3 s.h.
This course is designed to assist individual or groups of teachers with sufficient science background to develop, improve, or implement science curricula for the elementary and secondary schools. It will be concerned with the production of curricular materials for actual use and evaluation. Permission of instructor. Each semester. May be repeated (as topics vary) for nine credits.
- SCED 571: PROGRAM FOR IMPROVING ELEMENTARY SCIENCE (PIES)** 3 s.h.
PIES is designed to promote effective science teaching and instructional leadership in science in the elementary school. In-service teachers, through hands-on investigations in the life, physical, and earth sciences, will acquire knowledge of science, increase their skills in using science process skills, and develop positive attitudes toward science. A similar course, SCED 471: Program for Improving Elementary Science, is offered for undergraduate, senior, elementary majors. On demand. Permission of instructor required.
- SCED 572: PROGRAM FOR ENHANCING EDUCATIONAL LEADERSHIP IN SCIENCE (PEELS)** 1 s.h.
PEELS is designed to involve elementary administrator/teacher teams in exemplary science experiences. Teams are instructed in science process skills, effective science teaching strategies, development of science program goals, and the application of science education research to elementary school science programs. Each team will

design and implement an action plan which focuses on specific actions for the improvement of science in their own schools. On demand. Permission of instructor required.

SCED 573: CREATIVE INTEGRATION OF SCIENCE IN
ELEMENTARY EDUCATION (CISEE) 3 s.h.

The CISEE course is designed to help in-service elementary teachers learn how to integrate science content and science-process skills with other subject areas, including reading and language arts, math, social studies, physical education, art, music, and microcomputer education. A strong emphasis is placed on the use of hands-on investigations; teachers are required to design and implement lessons for their own students which demonstrate the integration of science and other elementary curriculum areas. On demand. Permission of instructor required.

SCED 574: SCIENCE AND SOFTWARE FOR ELEMENTARY TEACHERS 2 s.h.

This course is designed to help elementary teachers identify, select, and integrate science courseware appropriate for implementation into existing elementary school science curricula. Participants will use exemplary science courseware to introduce, enhance, and reinforce related hands-on science activities. The culminating project for this course is the presentation of action research findings related to the relationships between microcomputers and hands-on elementary school science. On demand. Permission of instructor required.

SCED 575: CAREER ORIENTATION IN SCIENCE AND TECHNOLOGY (COST) 3 s.h.

COST is designed to involve middle/junior high teachers in utilizing the skills of community resource people to demonstrate the need for science in many careers—including those not traditionally associated with science. The format of the course follows the COMETS (Career Orientated Modules to Explore Topics in Science) model. Teachers learn where to find science-resource people and how to work with the resource person to present lessons in the classroom. Teachers will be responsible for implementing lessons with a resource person during the course. On demand. Permission of instructor required.

SCED 576: SCIENCE, TECHNOLOGY AND SOCIETY: TOPICS FOR TEACHERS 3 s.h.

STS is an interdisciplinary course covering topics in biology, earth science, chemistry, and physics. Participants will be involved in studies and hands-on activities such as evaluating science computer software, testing water for chemical and biological agents, and studying high altitude infrared photography. Ethical issues and scientific principles concerning computers, energy, nuclear waste, biotechnology, and others, will be investigated and discussed. Participants will develop curriculum activities for implementation in secondary science. On demand. Permission of instructor required.

SCED 577: MICROCOMPUTER SCIENCE LABORATORY INTERFACE 1 s.h.

This course is designed to instruct elementary and/or secondary science teachers in basic interfacing and interfacing applications for their own classrooms. Course participants construct interfacing materials, set up related science investigations, and analyze data collected from the constructed probes. Course participants also explore possible uses for interfacing equipment in the science curriculum. On demand. Permission of instructor required.

SCED 578: INFORMATION TECHNOLOGY EDUCATION
FOR THE COMMONWEALTH (ITEC I) 3 s.h.

ITEC I is designed to provide teachers with computer literacy, programming skills, and experiences with exemplary courseware and software. The course is designed specifically for computer novices. Teachers will learn to operate and program microcomputers while developing skills needed for teaching their students to use microcomputers for classroom applications. The course also prepares teachers to evaluate courseware and software appropriate for use in their school curriculum. On demand. Permission of instructor required.

SCED 579: INFORMATION TECHNOLOGY EDUCATION
FOR THE COMMONWEALTH (ITEC II) 3 s.h.

Provides K-12 educators with intermediate-level competencies to effectively integrate microcomputer courseware, hardware, and related microprocessor technology into the teaching and learning process. Instructional theory for the design and evaluation of solutions to problems of learning, and using computer technology as a tool, will also be emphasized in the course. Students will complete a computer-generated portfolio of related lesson plans, handouts, transparencies, etc. On demand. Permission of instructor required.

SCED 585: PLANETARIUM OPERATION AND MANAGEMENT 3 s.h.

An introduction to the techniques of operation and maintenance of planetarium projectors. Opportunities are provided for writing and presenting programs at various levels of instruction. The use of auxiliary projectors, the production of audiovisual materials, multimedia displays and live versus programmed presentations are emphasized. Prerequisite: ES 200 and 201 or consent of instructor. On demand.

SCED 600: RESEARCH PROJECT IN SCIENCE EDUCATION 1-3 s.h.

With the approval of his or her advisor a student may research a selected topics related to the teaching of elementary and/or secondary science. Permission of instructor. Each semester. Maximum credits allowable toward graduation: 9 credits.

Master of Science Degree in Special Education

College of Education and Human Services

Department of Special Education and Rehabilitative Sciences

Graduate Faculty

Professors: B. Huwar; **Associate Professors:** R. Feroz, P. Gent, L. Gurecka, J. Krouse; **Assistant Professors:** M. Kilwein, A. Stearns, L. Turner, R. Sabousky

Program Objectives

The mission of the Master of Science program within the Department of Special Education and Rehabilitative Sciences is to provide opportunities:

- to update, broaden, and refine the skills and knowledge base of the veteran professional in designing, implementing, and evaluating instruction and services for individuals with disabilities;
- to extend knowledge and skills in research, administration, leadership, and the organization of service delivery;
- to analyze technically complex and current issues within the field; and
- to prepare for more advanced studies and careers in special education and rehabilitative sciences.

SPECIAL EDUCATION CONCENTRATION

The special education area of concentration is designed primarily for students whose career interests are in special education services and programs within educational agencies and institutions of higher education. Within the special education concentration area various options are offered. Students who presently hold a Pennsylvania special education teaching certificate take a core of 27 required graduate credits and in addition pursue 6 credits individually selected by the student in consultation with their advisor.

Students who presently hold a bachelor's degree from an accredited program may pursue the master's degree while completing additional course work leading to Pennsylvania certification in the area of special education. The specific course work for certification will be individually determined by the student's advisor after a review of the student's past course work and experience.

The graduate program in special education is accredited by the National Council for the Accreditation of Teacher Education (NCATE) and the Pennsylvania Department of Education (PDE).

REHABILITATIVE SCIENCES CONCENTRATION

The rehabilitation sciences area of concentration is designed for students whose career interests are in the area of community-based social, vocational, recreational, and personal management rehabilitation services in the areas of developmental disabilities, gerontology, and substance abuse. Within this concentration, students will take a core of 18 required graduate credits, and in addition, pursue an additional 15 credits individually selected by students in consultation with their advisors. Unless the applicant submits documenta-

tion of prior experience in the field through employment or practicum experience, six credits of REHB 495 must be taken in addition to the 33 required credits for the master's degree to fulfill the field experience component.

Admission Requirements

Clarion University's general admission requirements apply with the following supplemental requirement:

- Admission with provisional status may be granted at the discretion of the graduate faculty if the applicant's QPA is less than the required 2.75 out of 4.00. The student must provide evidence of ability to successfully undertake the program (e.g., particularly strong recommendations from another professional in a related field; a clear trend of improved QPA over time; a written explanation of the circumstances which led to the less than satisfactory QPA).

Students admitted provisionally must achieve full status within three semesters following the student's provisional admittance by completing not less than nine graduate credits from courses within the appropriate checksheet with a QPA of not less than 3.00 out of 4.00. Students who fail to achieve full status will be dropped from the program in which they are enrolled.

Degree Requirements

In addition to the general requirements of the Graduate College of Clarion University, students shall meet the following requirements:

- Students must complete a planned program of study approved by their advisors within one of the areas of concentration including a minimum of 33 credits.
- Students contemplating more advanced studies after completing the master's degree or contemplating careers which involve research may elect with the approval of their advisor a thesis project (SPED 590). Students electing SPED 590 and completing the thesis requirements are exempted from the SPED 599 requirement.

The purpose of electives is to provide flexibility within the program so students can further develop their knowledge, skills, and expertise in individual areas of career interest and to enhance their career options. The choice of electives is, therefore, not limited to SPED or REHB courses. With the **prior approval** of the student's advisor, the student may choose elective courses from other departments or institutions of higher education. Note: In accordance with Clarion University residency requirements, no more than a maximum of 30% of the total graduate credits may be transferred from other institutions.

Special Education Concentration

REQUIRED CORE—27 credits

ED	520:	Introduction to Research	3 s.h.
ED	521:	Instructional Leadership Skills	3 s.h.
ED	522:	Analysis of Teaching	3 s.h.
ED	523:	Curriculum Development and Evaluation	3 s.h.
SPED	500:	Contemporary Issues in Special Education	3 s.h.
SPED	505:	Concepts of Intelligence	3 s.h.
SPED	520:	Role Development with Parents	3 s.h.
SPED	535:	Advanced Methods for Individuals with Severe Disabilities	3 s.h.
	or		
SPED	536:	Advanced Methods for Individuals with Mild/Moderate Disabilities	3 s.h.
SPED	599:	Field Based Investigation	3 s.h.

ELECTIVES—6 credits

SPED	530:	Learning Disabilities	3 s.h.
SPED	540:	Behavior Disorders	3 s.h.
SPED	562:	Service Learning	3 s.h.
SPED	567:	Seminar in Advanced Applied Behavior Analysis	3 s.h.
SPED	580:	Special Reading Instruction	3 s.h.
SPED	590:	Special Projects	3 or 6 s.h.
SPED	596:	Contemporary Education Practices and Directions	3 s.h.
SPED	597:	Collaboration and Cooperation: Improved Teaching and Learning Outcomes	3 s.h.
SPED	415:	Instructional Development and Strategies for Individuals with Mild/Moderate Disabilities	3-6 s.h.
SPED	420:	Instructional Development and Strategies for Individuals with Severe/Profound Disabilities	3-6 s.h.
SPED	425:	Behavior Management in Special Education Settings	3 s.h.
REHB	405:	Substance Abuse	3 s.h.
REHB	410:	Prevention and Treatment of Substance Abuse	3 s.h.
REHB	545:	Rehabilitation: Philosophy and Principles	3 s.h.
REHB	565:	Seminar on Rehabilitative Service Delivery Systems	3 s.h.
REHB	580:	Intervention Strategies in Rehabilitative Sciences	3 s.h.

A maximum of six credits from the 400-level courses listed above can be taken for graduate credit with special permission.

Rehabilitative Sciences Concentration

REQUIRED CORE—18 credits

ED	520:	Introduction to Research	3 s.h.
REHB	545:	Rehabilitation: Philosophy and Principles	3 s.h.
REHB	565:	Seminar on Rehabilitative Service Delivery Systems	3 s.h.
REHB	575:	Administering Rehabilitation Delivery Systems	3 s.h.
REHB	580:	Intervention Strategies in Rehabilitative Sciences	3 s.h.
REHB	599:	Field Based Investigation	3 s.h.

ELECTIVES—15 credits

REHB	405:	Substance Abuse	3 s.h.
REHB	410:	Prevention and Treatment of Substance Abuse	3 s.h.
REHB	510:	Group Process in Rehabilitation	3 s.h.
REHB	537:	Lifestyle and Career Development	3 s.h.
SPED	567:	Seminar in Advanced Applied Behavior Analysis	3 s.h.
SPED	500:	Contemporary Issues in Special Education	3 s.h.
SPED	505:	Concepts of Intelligence	3 s.h.
SPED	520:	Role Development with Parents	3 s.h.
SPED	530:	Learning Disabilities	3 s.h.
SPED	535:	Advanced Methods for Individuals with Severe Disabilities	3 s.h.
SPED	536:	Advanced Methods for Individuals with Mild/Moderate Disabilities	3 s.h.
SPED	540:	Behavior Disorders	3 s.h.
SPED	590:	Special Projects	3 or 6 s.h.

A maximum of six credits from the 400-level courses listed above can be taken for graduate credit with special permission.

Graduate Assistantships

The Department of Special Education and Rehabilitative Sciences regularly awards a number of graduate assistantships. Assistantships in special education and rehabilitative sciences serve a variety of purposes. Graduate assistants (GAs) assist the professors in developing course materials and resources; evaluating the skills of undergraduates; carrying out literature searches; and supervising and assisting undergraduates in the computer lab. Graduate assistantships not only provide unique experiences within the field, but also are an opportunity for the student to pursue advanced training with financial support.

Applicants for a graduate assistantship must have completed all program application requirements and have been admitted in full standing to the program. A separate GA application must then be submitted to the Department of Special Education and Rehabilitative Sciences. All applications for GAs should be submitted by the beginning of February to ensure consideration for the following academic year.

Note: Graduate students who are completing a student teaching requirement as a part of state certification requirements or other internship or apprenticeship may not hold a graduate assistantship during the semester of their student teaching.

Certification Requirements

For students already holding Pennsylvania Instructional Level I certification in special education or its equivalent and the requisite years of creditable teaching experience, successful completion of the master's program can lead to Pennsylvania Instructional Level II certification. Note: It is the responsibility of the student holding a special education certificate from another state to ensure the certificate is equivalent to the Pennsylvania Instructional Level I certificate. Your advisor can assist you in this determination.

For students not already certified in special education but holding a bachelor's degree from an accredited program and wishing to become certified in special education while continuing their graduate studies, an individual course of study leading to both certification and the graduate degree is developed by the student's advisor with consideration for the student's background of education and experience in conjunction with state and program requirements.

Physical Facilities

The Department of Special Education and Rehabilitative Sciences is housed in a two-story wing of Stevens Hall on the Clarion Campus. In addition to the modern classrooms, an array of instructional support technology is available. On-campus resources include the Adult Development Program and The Child Development Center.

In addition to the numerous computer labs across the campus, there is a computer lab in Stevens Hall and another in the Department of Special Education and Rehabilitative Sciences. In the lab, students have access to a variety of instructional and management software along with IBM and MAC hardware and adaptive communication devices for computer and stand-alone devices. Students have access to mainframe computer support through the campus systems, and through the department, students also have access to computer networks such as SpecialNet and PENN*LINK.

The department maintains ongoing cooperative relations with numerous school districts, Intermediate Units, and rehabilitation programs in the region, all of which are available to assist in providing a wide array of field opportunities.

Release of Data from M.S. Thesis—Publication Policy

In accordance with professional ethics, any information from master's research should be published or otherwise released only in conjunction with the student's advisor. Publications resulting from research done at Clarion University shall give appropriate credit to persons involved in the research, to Clarion University, and to any granting agencies which supported the research.

Special Education Courses

A maximum of six credits from the 400-level courses listed below can be taken for graduate credit with special permission.

- SPED 415: INSTRUCTIONAL DEVELOPMENT AND STRATEGIES FOR INDIVIDUALS WITH MILD/MODERATE DISABILITIES 3 s.h.**
 Participants engage in the process of individualizing instruction for individuals with mild/moderate disabilities, including: designing basic instructional sequences using behavioral objectives; matching media, learner, and goal characteristics; identifying appropriate instructional strategies; and evaluating the effectiveness of instruction. Multicultural education is addressed. Prerequisites: SPED 320; ELED 323 and 324 [rehabilitative science majors exempted]. Each semester.
- SPED 418: EXCEPTIONALITIES IN THE REGULAR CLASSROOM 3 s.h.**
 This course is designed to prepare students to deal with the nature and needs of the exceptional person in a regular classroom. Contemporary methods of identification, services for the exceptional individual, and legal aspects of the least restrictive environment are examined. Each semester.
- SPED 420: INSTRUCTIONAL DEVELOPMENT AND STRATEGIES FOR INDIVIDUALS WITH SEVERE/PROFOUND DISABILITIES 3 s.h.**
 Participants engage in the process of individualizing instruction for individuals with severe/profound disabilities, including designing basic instructional sequences using behavioral objectives; matching media, learner, and goal characteristics; identifying appropriate instructional strategies; and evaluating the effectiveness of instruction. Prerequisites: SPED 320; ELED 323 and 324 (rehabilitative science majors exempted). Each semester.
- SPED 425: BEHAVIOR MANAGEMENT 3 s.h.**
 Participants acquire knowledge and skills related to contemporary curricular innovations in educational programs for individuals with disabilities with emphasis on sociocultural implications of changing curricular practices and the new instructional media and technology. Prerequisites: SPED 320 and 345; ELED 323 and 324 (rehabilitative science majors exempted). Each semester.
- SPED 500: CONTEMPORARY ISSUES IN SPECIAL EDUCATION 3 s.h.**
 Participants engage in problem-centered analyses and investigations, and in determination of responses relative to the contemporary issues confronting special education.
- SPED 505: CONCEPTS OF INTELLIGENCE 3 s.h.**
 Participants engage in an extensive study of the nature of cognition, traditional and contemporary, with emphasis on the development of a paradigm having relevance to the educational process.
- SPED 520: ROLE DEVELOPMENT WITH PARENTS 3 s.h.**
 Participants acquire knowledge and skills in working with and involving parents to maximize developmental and learning opportunities for their children with disabilities, and in responding to the unique challenges confronting families of children with disabilities.
- SPED 530: LEARNING DISABILITIES 3 s.h.**
 Participants acquire knowledge and skills for designing diagnostic/prescriptive programs in perceptual-motor, cognitive, linguistic, academic, social, and career domains for individuals with specific learning disabilities.
- SPED 535: ADVANCED METHODS FOR INDIVIDUALS WITH SEVERE HANDICAPS 3 s.h.**
 Participants acquire knowledge and skills related to the design, implementation, and evaluation of instructional interventions for individuals with severe/profound disabilities.
- SPED 536: ADVANCED METHODS FOR INDIVIDUALS WITH MILD/MODERATE HANDICAPS 3 s.h.**
 Participants acquire knowledge and skills related to the design, implementation, and evaluation of instructional interventions for individuals with mild/moderate disabilities.
- SPED 540: BEHAVIOR DISORDERS 3 s.h.**
 Participants engage in the study of maladaptive behavior in individuals with emphasis on current definitions, classification systems, major etiological perspectives, and contemporary interventions.
- SPED 562: SERVICE-LEARNING 3 s.h.**
 The course provides an overview of service-learning as a teaching methodology. History, legislation, and theory relevant to service learning is presented. Students learn the components and standards of service-learning. Students plan and implement service-learning projects relative to these. Students also learn how to assess service-learning projects, meet curricular and learner needs through service-learning, and develop community partners. Literature addressing the effectiveness of service-learning as a teaching tool and the relationship of service-learning to the educational reform movement will be examined.

SPED 567: SEMINAR IN ADVANCED APPLIED BEHAVIOR ANALYSIS 3 s.h.

This seminar examines contemporary theory research, and practice in applied behavior analysis with particular emphasis given to applications in the fields of special education and rehabilitative sciences. Prerequisite: SPED 425 or equivalent.

SPED 580: SPECIAL READING INSTRUCTION 3 s.h.

This course is designed to provide in-service and pre-service professionals with the knowledge and skills to serve students with mild/moderate reading disabilities. Individuals taking the course will assimilate characteristics of identified students, assessment processes and alternative interventions.

SPED 590: SPECIAL PROJECTS 3 or 6 s.h.

Participants engage in either scholarly or applied research related to the education of children and youth with disabilities under the supervision of a faculty member. For those participants electing the thesis option, SPED 590 shall be taken in two semesters of three credits each. During the first semester the participant is required to submit an approved proposal. During the second semester the participant implements the research and completes the project.

SPED 596: CONTEMPORARY EDUCATION PRACTICES AND DIRECTIONS 3 s.h.

This course saliently provides the philosophical and pragmatic basis for the rationale for change in contemporary education. Legislation, litigation, and research within the profession provide the foundation for understanding why the profession must explore innovative strategies for improving the educational outcomes of all children. Terminologies which dominate professional dialogue are explored and studied to separate dogma from substance. Learner characteristics, which are indicative of the diversity naturally present in society, are addressed relative to implications in teaching and learning.

**SPED 597: COLLABORATION AND COOPERATION:
IMPROVED TEACHING AND LEARNING OUTCOMES 3 s.h.**

This course is intended to improve the teaching and learning outcomes in basic education by focusing on collaboration and cooperative-education processes and teaching methodologies. The development of strategies for promoting professional and community collaborations established in SPED 596: Contemporary Education Practices and Directions, is continued in this offering. Teaching models and methods facilitative to encouraging and maintaining collaborative and cooperative-educational practices extend the skills of professional educators in appropriately serving the educational needs of an increasingly diverse learning audience. Prerequisite: SPED 596 or approval of instructor.

SPED 599: FIELD-BASED INVESTIGATION 3 s.h.

This course represents the culminating experience in the master's program in special education and requires participants to systematically integrate and apply knowledge and skills developed throughout the program. Under faculty supervision, participants identify an educationally significant problem, conduct literature reviews, formulate and test hypotheses, and report results in a forum open to special education faculty and graduate students. Prerequisites: ED 520 and SPED 535 or 536. Each semester.

Rehabilitative Sciences Courses

A maximum of six credits from the 400-level courses listed below can be taken for graduate credit with special permission.

REHB 405: SUBSTANCE ABUSE 3 s.h.

Participants engage in the study of the physiological and psychological implications of drug or alcohol abuse, over-medication, and drug dependence with emphasis on the processes of intervention, advocacy, treatment, and prevention. Fall, annually.

**REHB 410: PREVENTION AND TREATMENT STRATEGIES
IN SUBSTANCE ABUSE 3 s.h.**

Participants engage in the study of societal pressures, attempts to prevent substance abuse, and treatment strategies along with comparative analysis of efficacy. Prerequisite: REHB 405. Spring, annually.

REHB 510: GROUP PROCESS IN REHABILITATION 3 s.h.

Participants engage in the study of group development, dynamics, theory, leadership styles, participant roles, techniques, and evaluation of effectiveness as applied to rehabilitative services contexts.

REHB 537: LIFESTYLE AND CAREER DEVELOPMENT 3 s.h.

Participants engage in the analysis of economic, social, and psychological factors which define the context of educational, vocational, and personal decision-making; decision-making related to vocational development; the role of information in facilitating decision-making; and the varieties of information, resources, and types of access available.

REHB 545: REHABILITATION: PHILOSOPHY AND PRINCIPLES 3 s.h.

Participants engage in the analysis of the values, assumptions, and the principles underlying theories of rehabilitation and their relation to the goals and objectives of rehabilitation programs.

REHB 565: SEMINAR ON REHABILITATIVE SERVICE DELIVERY SYSTEMS 3 s.h.

Participants explore the continuum of human service delivery systems, with special focus on aging, mental retardation, and substance abuse. History and student professional experiences are considered in addition to current information and trends to identify problems and opportunities for making systems more responsive to consumer needs.

REHB 567: SEMINAR IN ADVANCED APPLIED BEHAVIOR ANALYSIS 3 s.h.

This seminar examines contemporary theory, research, and practice in applied behavior analysis with particular emphasis given to applications in the fields of special education and rehabilitative sciences. Prerequisite: SPED 425 or equivalent.

REHB 575: ADMINISTERING REHABILITATION DELIVERY SYSTEMS 3 s.h.

Participants engage in the study of the business and personnel aspects of functioning in and managing human service delivery systems, including organization, operations, and management relative to legal, economic, and personnel standards and practice.

REHB 580: INTERVENTION STRATEGIES IN REHABILITATIVE SCIENCES 3 s.h.

Participants review and practice a variety of common clinical intervention techniques used by professionals in mental retardation, gerontological, and substance abuse treatment. These include creative and expressive techniques (e.g., art, music, drama, recreation, horticulture), behavioral interventions (e.g., relaxation, systematic desensitization, contracts), and didactic group and individual work.

REHB 599: FIELD-BASED INVESTIGATION 3 s.h.

This course represents the culminating experience in the master's program in rehabilitative sciences and requires participants to systematically integrate and apply knowledge and skills developed throughout the program. Under faculty supervision, participants identify an educationally significant problem, conduct literature reviews, formulate and test hypotheses, and report results in a forum open to special education faculty and graduate students. Prerequisite: ED 520. Each semester.

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Index

Academic Affairs	88	Economics, Courses in	29
Academic Honesty	7	Education	44
Accountancy Professional Course of Study	26	College of Education and Human Services	44
Accounting, Courses in	27	Courses in	47
Accreditation	iii	Elementary	44
Administrative Staff	88	Reading	43
Admission (also see individual programs)	4	Employment (see Career Services)	15
Courtesy/Transient	5	English	51
Eligibility	4	Courses in	53
International Students	6	Master of Arts	51
Non-Degree Students	5	Enrollment, Courtesy/Transient	5
Procedures	5	Environmental Education Certification	76
Provisional	4	Externships	41
Regular Full	4	Faculty, Graduate	89
Advisement (also see individual programs)	10	Faculty, Courtesy Clinical MSN/FNP Program	94
Application Fee	11	Fees	11
Assistantships (also see individual programs)	12	Finance, Courses in	30
Auditing Courses	10	Financial Aid	13
Automobiles	15	Full-Time Status	9
Biology	16	Grading System	9
Admission	16	Graduate Management Admissions Test (GMAT)	24
Advisement	18	Graduate Record Examination	4, 16, 39, 51, 56, 69
Courses in	20	Health Services	14
Department of	16	History, University	2
Master of Science in	16	Housing	14
Programs	16	In Progress Grades	10
Requirements	17	Incomplete Grades	10
Board of Governors	88	Insurance	14
Business Administration	24	International Students	6
College of	24	Internships	See individual programs
Courses in	28	Library	13
Master of	24	Library Science	55
Calendar, Academic	iv	Courses in	60
Career Services	15	Master of Science in	55
Certificate of Advanced Studies	57	Media Certificate	57
Certification		Loans	13
Environmental Education	76	Management, Courses in	30
Reading Specialist	46	Marketing, Courses in	31
School Library Media	57	Master of Business Administration	24
Clarion Campus	2	Liberal Arts Pre-Professional Option	26
Communication	32	Professional Accountancy	26
Courses in	35	Course of Study	27
Master of Science in	32	Master of Science	
Communication Sciences and Disorders	38	in Biology	16
Courses in	41	in Communication	32
Master of Science in	38	in Communication Sciences and Disorders	38
Comprehensive Examinations	10	in Library Science	55
Computing Services	13	in Nursing	68
Cooperative Doctoral Program	76	in Special Education	81
Council of Trustees	88	Mathematics	64
Credit, Transfer of	8	Courses in	65
Degree Completion	9	Master of Education in	64
Degrees	iii	Media Certificate, Library Science	57
Master of Arts in English	51	Miller Analogies Test	4, 56
Master of Business Administration	24	Non-Degree Students	5
Master of Education in Elementary Education	44	Non-Resident Fees	11
Master of Education in Mathematics	64	Nursing	68
Master of Education in Reading	45	Courses in	72
Master of Education in Science Education	74	Master of Science in	68
Master of Science in Biology	16	Parking	15
Master of Science in Communication	32	Placement	See individual programs
Master of Science in Communication		Policies and Procedures	7
Sciences and Disorders	38	Pymatuning Laboratory of Ecology	19
Master of Science in Library Science	55	Quality-Point Average (also see individual	
Master of Science in Nursing	68	programs for requirements)	4
Master of Science in Special Education	81	Reading	45
Dining Fees	11	Courses in	47
Directories	88	M.Ed. in	45
Doctoral Program, Cooperative	76	Specialist Certification	46

Refunds	12	Student Affairs, Office of	89
Rehabilitative Sciences	81	Students	
Requirements		International	6
Admission	5	Full-Time Status	9
Degree	See individual programs	Non-Degree	5
Research	10	Non-Resident	11
Residency	8	Resident	11
Resident Fees	11	Test of English as a Foreign Language (TOEFL)	6
Responsibility, Student	11	Thesis (also see individual program)	10
Rural Librarianship, Center for the Study of	59	Transcripts	5, 12
School Library Media Certificate	57	Transfer Credit (also see individual programs)	8
Science Education	74	Venango Campus	2
Cooperative Doctoral Program	76	Veterans	13
Courses in	77	Withdrawals	9
Environmental Education Certification	76		
Master of Education in	74		
Special Education and Rehabilitative Sciences	81		
Courses in	85		
Special Certification	84		

