Career and Technology Teacher Education

Professor Godfrey Nwoke, Chair
Namm 523
718.260.5373
email: gnwoke@citytech.cuny.edu

PROGRAMS:

Career and Technical Teacher Education/BS in Ed
Technology Teacher Education/BS in Ed

FACULTY:

Assoc Prof: Nwoke
Asst Profs: Aneke, Wilkin

Bachelor of Science in CAREER AND TECHNICAL TEACHER EDUCATION

The Career and Technical Teacher Education program at New York City College of Technology is accredited by the National Council for Accreditation of Teacher Education (NCATE). The program provides students with the required professional knowledge and skills as career, technical and trade subject teachers leading to the provisional/permanent or Initial/Professional New York State certifications, New York City licensure and the bachelor's degree in education. Men and women with career and technical backgrounds in such diverse fields as nursing, dental laboratory technology, vision care technology, culinary and pastry arts, construction technology, information technology (IT) and computer systems technology, among many others, can complete the baccalaureate program to prepare for teaching positions in public, Career and Technical Education (CTE) and comprehensive high schools, BOCES, correctional institutions, private trade schools, and for a variety of training positions in industry.

Graduates of the program who wish to advance to supervisory and administrative positions in education can pursue graduate degrees in such areas as administration and supervision, which are available in The City University of New York and elsewhere.

Several colleges and universities across the country also offer graduate programs for baccalaureate degree holders in career and technical teacher education who wish to pursue careers in college and university teaching. Because entrance requirements differ from one institution to another, those interested in further education should discuss their educational plans with an academic adviser at the earliest opportunity.

Career and Technical Teacher Education Conceptual Framework

The conceptual framework for the Career and Technical Teacher Education program is grounded on the underlying themes of Professionalism, Technology and Diversity (P/T/D). It embodies our mission, as urban educators, to prepare professionally competent, reflective, and caring technical educators for a world of technology and diversity. Therefore, every graduate of the program is prepared to demonstrate:

General Knowledge
- based on a strong foundation in the liberal arts and sciences and forms the basis for our shared values, understandings, and responsibilities in a democracy;

Technical Competency
- based on knowledge and skill in career and technical education content areas to enable students to achieve high standards of learning and performance.

Professional Competency
- based on knowledge of students and proficiency in designing instruction appropriate for their developmental levels and needs; proficiency in designing, planning, implementing, and managing the instructional process in a safe and nurturing environment; and using a variety of methods, assessment techniques and resources.

Competency in the Use of Technology
- ability to use modern computer technology and the Internet to facilitate and enhance the instructional process and student learning.

Caring Dispositions
- personal and interpersonal characteristics that build upon and enhance dispositions to be caring professionals who have respect for learners of every age and background.

Reflective Practice
- opportunities for critical analysis, evaluation, and continuous improvement of professional practice and life-long learning.

Sensitivity to Diversity
- awareness of the diverse cultures that make up our urban schools, communities and our global society; and the basis for practices that support and meet students' learning needs.

Admission into the Career and Technical Teacher Education Program

Students may enter the program as freshmen if they meet the general College criteria on pages 9, 32. Alternatively, they may transfer from one of the City Tech AAS, AA or AS programs before or after completing the associate degree. Students from other colleges may also apply for admission as transfer students if they meet College criteria for transfer admission. Students with questions are advised to consult the office of admissions. An associate degree in career and technical teacher education is not required for admission to the BS in Ed Program. Students transferring from other colleges or from programs within City Tech will have their academic records evaluated to determine their appropriate placement in the program. A minimum grade point average of 2.5 is required for transfer.

Regardless of the mode of admission, prospective students must

meet CUNY proficiency requirements. To be admitted to teacher education, all applicants must write an essay and must be interviewed by program faculty to determine their eligibility for state certification and potential for success in the program. Students must receive a grade of "B" or better in each course taken in the major. They must maintain a minimum cumulative grade point average of 2.5 in order to continue in the program beyond 12 credits and enroll in student teaching. A minimum grade point average of 2.7 is required for graduation.

Occupational Experience Verification and Competency Validation

All prospective students of the program must be prepared to provide documentation of appropriate work experience in the occupational area for which they will ultimately seek state teaching certification. The duration of occupational experience that will be required depends on the student's previous educational background as follows: high school diploma or equivalent – four years; associate degree in appropriate occupation – two years.

Students who do not meet the work experience requirement but who received appropriate occupational training through a CTE high school or an associate degree program will be required to have a plan for acquiring the required work experience prior to completing a total of 30 credits of course work or applying for the provisional or initial certificate.

Degree-seeking students must also satisfy the occupational competency requirement in order to be eligible for graduation. The occupational competency requirement may be satisfied in any of the following ways:

- Possessing an approved national or state license in the relevant career or technical specialty (for example, NYS Registered Nursing license, NYS Dental Assisting license, and the FAA Airframe and Power Plant license); or
- Passing the performance and written tests of the National Occupational Competency Testing Institute (NOCTI) in the relevant occupation; or
- Completing at least 36 credits of college course work at the associate or baccalaureate level in a relevant career or technical specialty.

Students who satisfy the occupational competency requirement through testing or approved license must take an additional course work of 6 credits in the teaching subject to satisfy the content core requirement and could earn up to a maximum of 30 credits towards the degree depending on the total credits earned in residence as follows:

- 34 and above 30 credits for occupational competency
- 15 to 33 15 credits for occupational competency

Program Completion and Certification

The degree program is designed to enable students to meet their immediate and long-range career objectives, which, in most cases, are to obtain state certification and the New York City teaching license while earning the BS in Ed degree. Given that New York City teachers cannot receive a teaching license until they have been certified by the state, courses are sequenced with state certification requirements and students' career needs in mind. Please note that effective February 2, 2004, candidates applying for The New York State Initial Certificate must meet the following requirements:

- Initial Certificate – an associate degree or its equivalent; passing a content specialty test (CST) e.g., NOCTI; and passing the New York State Teacher Certification Examinations (NYSTCE) Assessment of Teaching Skills-Written Test (ATS-W).
- Professional Certificate – the Initial Certificate, 45 additional college credits, and passing the NYSTCE Liberal Arts and Science Test (LAST).

(See the department chair for further information concerning certification examinations.)

PEDAGOGICAL CORE		**Credits**
EDU 2510/ED 251	Orientation to Career and Technical Education	3
EDU 2520/ED 252	Occupational Analysis and Curriculum Organization	3
EDU 2353/ED 353	Laboratory Organization and Management of Instruction	3
EDU 2362/ED 362	Methods of Teaching in Career and Technology Education I	3
EDU 3630/ED 363	Assessing Student Learning Outcomes	3
EDU 3640/ED 364	Computers in Education	3
EDU 3650/ED 365	Mainstreaming in Education	3
EDU 4600/ED 460	Professional Development Seminar	2
EDU 4620/ED 462	Methods of Teaching in Career and Technology Education II	3
EDU 4870/ED 487	Supervised/Student Teaching in Career and Technical Education	6
	Subtotal	**32**

PEDAGOGICAL ELECTIVES
Select 3 credits from the following (only with department approval):

EDU 3680/ED 368	Internship in Career and Technical Education	2
EDU 2351/ED 351	Contemporary Issues in Education	2
EDU 2354/ED 354	Methods of Adult Learning in Career and Technical Education I	3
EDU 2355/ED 355	Methods of Adult Learning in Career and Technology Education II	3
EDU 2455/ED 455	Methods and Materials for Special Needs Students	3
EDU 2457/ED 457	Vocational Guidance for Teachers	3
EDU 4580/ED 458	Coord. of Diversified Work-based Learning I, Coop. Organization	3
EDU 4590/ED 459	Coord. of Diversified Work-based Learning II, Coop. Operations	3

EDU 4990/ED 499	Independent Study	1-3
	Subtotal	**35**

CONTENT CORE[1]

EDU 3700/ED 370	Practicum in Occupational Competency: Performance	15
EDU 3720/ED 372	Practicum in Occupational Competency: Written	15
	Subtotal	**30**

[1] This requirement may be satisfied by possessing an associate degree in a CTE subject area that meets the NYS learning standards in Career and Occupational Studies (CDOS). The associate degree program must include at least 36 semester hours in the occupational subject to be taught. Competency in the content core may also be verified using the written and performance (experienced worker) examinations of the National Occupational Competency Testing Institute (NOCTI), or by any other approved state or national licensing examination. Credit through examination or occupational license is awarded only upon completion of at least 15 credits within both the general and pedagogical cores.

OTHER REQUIRED COURSES[2]		**Credits**
ENG 1101/EG 101	English Composition I	3
ENG 1121/EG 121	English Composition II	3
SPE 1330/TS 330	Effective Speaking	3
MATH 1	MAT 1180/MA 180	4
MATH 2	MAT 1280/MA 280	4
SCI 1	BIO 1101/BY 101 or CHEM 1110/CH 110 or PHYS 1111/SC 111 or PHYS 1433/SC 433	4
SCI 2	BIO 1201/BY 201 or CHEM 1210/CH 210 or PHYS 1112/SC 112 or PHYS 1434/SC 434	4
LAP	PHIL 1106/PH 106	3
	ARTH 1103/HU 103	3
	ENG 2001/EG 200	3
	MUS 1201/HU 201 or MUS 1207/HU 207 or MUS 1210/HU 210	3
	ARTH 1106/HU 106 or AFR 1212/AF 212 or PRS 2202/PR 202	3
BS/SS	PSY 1101/PS 101	3
	PSY 2501/PS 501 or EDU 2610/ED 261	3
	PSY 3502/PS 502 or EDU 3610/ED 361	3
	SOC 1101/SO 101	3
	HIS 1101/HI 110	3
	SOC 2401/SO 401	3
	Subtotal	**58**
TOTAL CREDITS REQUIRED FOR THE DEGREE		**123**

[2] See page 34 for detailed explanation of core required courses and categories.

Bachelor of Science in Education in TECHNOLOGY TEACHER EDUCATION

The Technology Teacher Education program at New York City College of Technology is accredited by the National Council for Accreditation of Teacher Education (NCATE) and nationally recognized by the International Technology Education Association-Council on Technology Teacher Education (ITEA-CTTE).

Technology teacher education is a comprehensive hands-on program designed to enable students in kindergarten through 12th grade to develop technological literacy. Technological literacy is the ability to develop, use, manage, understand and assess technology. In technology teacher education, prospective teachers are prepared to develop the knowledge, skills and dispositions required to teach technology education in kindergarten through 12th grade.

The New York State Board of Regents mandates one year of introduction to technology education for all students in the middle school. In addition, a wide range of courses in technology education is taught at the senior high school level, including computer information technology (IT), graphic communication technology, construction and manufacturing technology, computer-aided drafting and design (CADD) technology, electronics technology, and transportation systems technology.

Although the primary goal of the Technology Teacher Education program is to prepare competent technology teachers, alternate career opportunities exist for graduates of the program. Many graduates have established careers in business and industry, taking advantage of their technical expertise and their liberal arts and professional education with its emphasis on human development and learning. The master's degree is required for the New York State permanent or professional certificate as a technology teacher. Graduates of the baccalaureate program in technology teacher education have the opportunity to pursue a master's degree in instructional technology, educational administration and supervision, special education, or other education specialties that are offered in The City University and elsewhere in the country.

Technology Teacher Education Conceptual Framework

The conceptual framework for the Technology Teacher Education program is grounded on the underlying themes of Professionalism, Technology and Diversity (P/T/D). It embodies our mission, as urban educators, to prepare professionally competent, reflective, and caring technical educators for a world of technology and diversity. Therefore, every graduate of the program is prepared to demonstrate:

General Knowledge

- based on a strong foundation in the liberal arts and sciences and forms the basis for our shared values, understandings, and responsibilities in a democracy.

Technical Competency

- knowledge of the subject matter of technology and skills in the development and utilization of a wide range of technological systems and resources.

Professional Competency
- based on knowledge of students and proficiency in designing instruction appropriate for their developmental levels and needs; proficiency in designing, planning, implementing, and managing the instructional process in a safe and nurturing environment; and using a variety of methods, assessment techniques and resources.

Competency in the Use of Technology
- ability to use modern computer technology and the Internet to facilitate and enhance the instructional process and student learning.

Caring Dispositions
- personal and interpersonal characteristics that build upon and enhance dispositions to be caring professionals who have respect for learners of every age and background.

Reflective Practice
- opportunities for critical analysis, evaluation, and continuous improvement of professional practice and life-long learning.

Sensitivity to Diversity
- awareness of the diverse cultures that make up our urban schools, communities and our global society; and the basis for practices that support and meet students' learning needs.

Admission into Technology Teacher Education

There are many ways a student can enter technology teacher education. Students may enter the bachelor of science in education (BS in Ed) degree program as freshmen if they meet the general College criteria for baccalaureate admissions found on pages 9, 32. They may transfer in from one of the City Tech AAS, AA or AS programs before or after completing the associate degree. Students may enter from other colleges if they meet College criteria for transfer admissions. Applicants with questions are advised to consult the office of admissions. It is not necessary to have earned an associate degree before transfer into the program. Transcripts of entering students will be evaluated to determine the courses they must complete for the bachelor of science in education degree. A minimum grade point average of 2.5 is required for transfer into the program.

Regardless of the mode of admission, prospective students must meet CUNY proficiency requirements. To be admitted to teacher education all applicants must write an essay and must be interviewed by program faculty to determine their eligibility for state certification and potential for success in the program. Students must receive a grade of "B" or better in each course taken in the major. They must maintain a minimum cumulative grade point average of 2.5 in order to continue in the program beyond 12 credits and to enroll in student teaching. A minimum grade point average of 2.7 is required for graduation.

Students currently enrolled in or graduates of programs in the technologies who are interested in pursuing a teaching career are well suited to progression in technology teacher education. Please consult the department chair for further information.

Program Completion and Certification

The proposed curriculum requires successful completion of a total of 123 credits distributed as follows: 58 credits of general education (arts and sciences core) courses, 36 credits of technology education content core courses and 29 credits of pedagogical core courses. Students who complete the degree program of study are recommended for the New York State provisional or initial teaching certificate. By completing the degree program of study, students also fulfill the New York City licensing requirements. Passing the NYSTCE Liberal Arts and Sciences Test (LAST), the Assessment of Teaching Skills-Written (ATS-W), and the Content Specialty Test (CST) is required for certification and licensing. (See the department chair for further information.)

PEDAGOGICAL CORE		**Credits**
EDU 2600/ED 260	Internship in Classroom Teaching I	1.5
EDU 3410/ED 341	Technology Education Foundations and Curriculum Development	3
EDU 3600/ED 360	Internship in Classroom Teaching II	1.5
EDU 2362/ED 362	Methods of Teaching in Career and Technology Education I	3
EDU 3630/ED 363	Assessing Student Learning Outcomes	3
EDU 3640/ED 364	Computers in Education	3
EDU 3650/ED 365	Mainstreaming in Education	3
EDU 3660/ED 366	Supervised/Student Teaching I	3
EDU 4600/ED 460	Professional Development Seminar	2
EDU 4620/ED 462	Methods of Teaching in Career and Technology Education II	3
EDU 4660/ED 466	Supervised/Student Teaching II	3
	Subtotal	**29**
CONTENT CORE		
EDU 1400/ED 140	Design and Drafting I	2
EDU 1420/ED 142	Construction Systems	3
EDU 2400/ED 240	Design and Drafting II	2
EDU 2410/ED 241	Survey of Technological Development	3
EDU 2440/ED 244	Manufacturing Systems	3
EDU 2460/ED 246	Communications Systems	4
EDU 3400/ED 340	Technological Systems I	3
EDU 3420/ED 342	Electronics Systems	4
EDU 3440/ED 344	Transportation Systems	3
EDU 4480/ED 448	Principles of Engineering	3
ELECTIVES (Select Option A or B)		
OPTION A COMPUTER TECHNOLOGY		
Select 6 credits from one specialization area:		
Programming		
CST 1101/CS 101	Comp. Programming and Problem Solving	3
CST 2403/CS 403	Introductory C Language Programming	3
CST 3503/CS 503	Advanced C Language Programming	3

Networking		
MST 1205/MS 205	Microcomputer Systems	3
MST 2307/MS 307	Local Area Networks	4
MST 2405/MS 405	Microcomputer Operating Systems	4
Databases		
CST 1101/CS 101	Comp. Programming and Problem Solving	3
MST 1204/MS 204	Data Base Systems Programming I	3
MST 2304/MS 304	Data Base Systems Programming II	3

OPTION B TECHNOLOGY SYSTEMS
Select 6 credits from the following:

EDU 4400/ED 440	Technological Systems II	3
EDU 4420/ED 442	Energy Systems	3
EDU 4440/ED 444	Electronic and Robotic Systems	3
EDU 4990/ED 499	Independent Study	1-3
	Subtotal	**36**

BACCALAUREATE CORE[1]

ENG 1101/EG 101	English Composition I	3
ENG 1121/EG 121	English Composition II	3
SPE 1330/TS 330	Effective Speaking	3
MATH 1	MAT 1275/MA 275	4
MATH 2	MAT 1375/MA 375	4
SCI 1	BIO 1101/BY 101 or CHEM 1110/CH 110 or PHYS 1111/SC 111 or PHYS 1433/SC 433	4
SCI 2	BIO 1201/BY 201 or CHEM 1210/CH 210 or PHYS 1112/SC 112 or PHYS 1434/SC 434	4
PHIL 1106/PH 106		3
ARTH 1103/HU 103		3
ENG 2001/EG 200		3
MUS 1201/HU 201 or MUS 1207/HU 207 or MUS 1210/HU 210		3
ARTH 1106/HU 106 or AFR 1212/AF 212 or PRS 2202/PR 202		3
PSY 1101/PS 101		3
PSY 2501/PS 501 or EDU 2610/ED 261		3
PSY 3502/PS 502 or EDU 3610/ED 361		3
SOC 1101/SO 101		3
HIS 1110/HI 110		3
SOC 2401/SO 401		3
	Subtotal	**58**
TOTAL CREDITS REQUIRED FOR THE DEGREE		**123**

[1] *See page 34 for detailed explanation of core required courses and categories.*

COURSES:

EDU 1400/ED 140
Design and Drafting I
2 cl hrs, 2 lab hrs, 2 cr
Use of drafting tools and techniques in the design process. Orthographic projection, sectional views, auxiliary views, basic pictorial drawing, introduction to working drawings, geometric constructions, development of drawing skills, and introduction to two-dimensional CAD.
Prerequisite: None (open to majors only)

EDU 1420/ED 142
Construction Systems
2 cl hrs, 2 lab hrs, 3 cr
Course is designed to give the student an understanding of construction systems. Laboratory activities include residential structures, foundations, framing, roofing, wiring and plumbing. Safety instruction in middle-and high-school laboratory settings is emphasized.
Prerequisite: None (open to majors only)

EDU 2400/ED 240
Design and Drafting II
2 cl hrs, 2 lab hrs, 2 cr
Product design and development, intersections, surface developments, advanced pictorial drawing, cams, perspective drawing, introduction to architectural drawing, two- and three-dimensional CAD.
Prerequisite: EDU 1400/ED 140

EDU 2410/ED 241
Survey of Technological Development
2 cl hrs, 2 lab hrs, 3 cr
A hands-on study of the development of technology as related to the advancement of civilization. Activities include research, modeling and/or construction of significant technological systems and devices of the past, present and future.
Prerequisite: EDU 1400/ED 140

EDU 2440/ED 244
Manufacturing Systems
2 cl hrs, 2 lab hrs, 3 cr
This course is designed to give the student an understanding of metalworking and manufacturing systems. Laboratory activities include layout techniques, hand and machine cutting, forming, joining, measuring, fabricating, and basic machine tool operations.
Prerequisites: EDU 1400/ED 140, EDU 1420/ED 142

EDU 2460/ED 246
Communications Systems
3 cl hrs, 3 lab hrs, 4 cr
A study of communications systems including photo-offset lithography, desktop publishing, audio production, video production and editing. Cold type composition, silk screen, and use of the microcomputer in communications.
Prerequisite: None (open to majors only)

EDU 2510/ED 251
Orientation to Career and Technical Education
3 cl hrs, 3 cr
An introductory course providing an overview of career and technical education. Focus on delivery systems, purposes, historical developments, and changing occupational patterns.
Prerequisite: None (open to majors only)

EDU 2520/ED 252
Occupational Analysis and Curriculum Organization
3 cl hrs, 3 cr
Techniques and applications of analysis, providing basis for translating occupational knowledge, skills and attitudes into effective teacher-student activities.
Prerequisite: None (open to majors only)

EDU 2600/ED 260
Internship in Classroom Teaching I
1 cl hr, 6 field hrs, 1.5 cr
This is the first of two internship experiences designed to expose the pre-service teacher to the classroom environment and to the daily routines of classroom teaching. Interns must spend a minimum of 6 hours per week for 10 weeks or a minimum of 60 hours per semester in a middle school (5-9) setting, under the supervision of a mentor and a college supervisor. Field experiences are accompanied by written reports, reflective essays and scheduled seminars. Departmental approval is required one semester in advance.
Prerequisites: EDU 3410/ED 341 and department approval required; corequisite: EDU 2610/ED 261

EDU 2610/ED 261 or PSY 2501/PS 501/
Child and Adolescent Development
3 cl hrs, 3 cr
Exploration of childhood and adolescent development. Analyses of

developmental theories and principles in the areas of perception, cognition, language, personality, social relations, moral behavior and developmental disorders. Emphasis is placed on application of findings in educational settings.
Prerequisite: PSY 1101/PS 101

EDU 3400/ED 340
Technological Systems I
2 cl hrs, 3 lab hrs, 3 cr
Addresses the "Introduction to 7th Grade Technology" NYS mandate. Hands-on, laboratory-based activities focus on inquiry, science, math, computer applications and social science concepts that underlie technological systems. Emphasis is on student logs and self-assessment techniques.
Prerequisite: EDU 1400/ED 140

EDU 3410/ED 341
Technology Education Foundations and Curriculum Development
3 cl hrs, 3 cr
The development of technology education, its aims and objectives. Analysis of the technology education curriculum, instructional resources facilities, management, maintenance, safety, and daily routines. Emphasis on New York State Learning Standards for Mathematics, Science, and Technology as a source of content.
Prerequisite: Two EDU/ED lab courses

EDU 3420/ED 342
Electronic Systems
2 cl hrs, 3 lab hrs, 4 cr
Study of electricity and electronics including D.C. and A.C., sources, components, circuits. Communication and information systems. Techniques for instruction, lab setup, simple lab projects, and activities in middle and high school are emphasized.
Prerequisite: EDU 2400/ED 240

EDU 3440/ED 344
Transportation Systems
2 cl hrs, 2 lab hrs, 3 cr
A study of the modes of moving goods and people from one location to another. Focuses on the exploration of and analysis of basic principles and concepts underlying design and development of various transportation systems. Emphasis is on laboratory design and experimentation activities as well as curriculum implementation in grades K through 12.
Prerequisite: EDU 1400/ED 140

EDU 2351/ED 351
Contemporary Issues in Education
2 cl hrs, 2 cr
Analyses of current issues and trends in education. Emphasis is on contemporary social, technological and pedagogical issues and their impact on education curriculum content and instructional delivery.
Prerequisite: None
(open to majors only)

EDU 2353/ED 353
Laboratory Organization and Management of Instruction
3 cl hrs, 3 cr
Organizational techniques for effective career and technical education instruction. Includes means of record-keeping, laboratory/shop design and maintenance.
Prerequisite: None
(open to majors only)

EDU 2354/ED 354
Methods of Adult Learning in Career and Technical Education I
3 cl hrs, 3 cr
This course is designed to give the beginning adult teacher specific knowledge and background about adult learning and conditions that favor learning.
Prerequisite: None
(open to majors only)

EDU 2355/ED 355
Methods of Adult Learning in Career and Technical Education II
3 cl hrs, 3 cr
Principles and philosophy of adult education with emphasis on conditions that favor adult learning. Effective techniques for organizing the curriculum.
Prerequisite: None
(open to majors only)

EDU 3600/ED 360
Internship in Classroom Teaching II
1 cl hr, 6 field hrs, 1.5 cr
This course is the second in the sequence of field experiences mandated by the Regents in the teacher preparation standards. It provides the student teacher the opportunity for further familiarity with the classroom environment prior to student teaching. A minimum of 60 hours of classroom experience at the adolescent education level (Grades 7-12) is required. The field experience must be accompanied by and supplemented with seminars, written reports and reflective essays.
Prerequisites: EDU 2600/ED 260, EDU 2610/ED 261, EDU 3410/ED 341

EDU 3610/ED 361 or PSY 3502/PS 502
Human Learning and Instruction
3 cl hrs, 3 cr
Exploration of variables underlying effective instruction. Analyses of learning theories and principles in the areas of classical conditioning and instrumental learning, generalization and discrimination, verbal learning and transfer, short-term and long-term memory; reward and punishment and the effect of motivation on learning.
Prerequisite: PSY 1101/PS 101

EDU 2362/ED 362
Methods of Teaching in Career and Technology Education I
3 cl hrs, 3 cr
Experience and development of teaching skills utilizing lectures, demonstrations, models, exhibits, mock-ups, and other methods of instruction. Lesson-planning, use and construction of instructional devices, selection and sequence of subject matter.
Prerequisite: None
(open to majors only)

EDU 3630/ED 363
Assessing Student Learning Outcomes
3 cl hrs, 3 cr
A study of traditional and alternative assessment techniques. Provides hands-on experiences on development and administration of assessment instruments and interpretation of assessment data. Using assessment and analysis results to improve instruction.
Prerequisite: EDU 2362/ED 362

EDU 3640/ED 364
Computers in Education
2 cl hrs, 3 lab hrs, 3 cr
A hands-on computing literacy course on how microcomputers can improve teaching and learning environments. Emphasis is placed on the process of planning, designing and implementing pedagogical techniques that best facilitate student learning. Topics include: word processing, spreadsheet and database management systems, interactive multimedia software, Internet and World Wide Web.
Prerequisite: EDU 2362/ED 362

EDU 3650/ED 365
Mainstreaming in Education
3 cl hrs, 3 cr
An overview of topics, issues and legislation concerning the mainstreamed student within career and technology education settings.
Prerequisite: EDU 2362/ED 362

EDU 3660/ED 366
Supervised/Student Teaching I
9 field hrs, 3 cr
This is the first of two field based student teaching experiences mandated in the regents standards for preparing classroom teachers. Provides an opportunity for the pre-service or in-service teacher with limited experience to develop and demonstrate competencies in teaching under the guidance of a cooperating teacher and a college supervisor. Emphasis is on instructional planning, implementation and assessment. Must be accompanied by written reports, reflective essays and scheduled seminars. The course requires a minimum of 100 hours of classroom experience (9 hours per week). Prior approval of departmental faculty must be obtained one semester in advance.
Prerequisites: EDU 3600/ED 360, EDU 3610/ED 361, EDU 2362/ED 362, SPE 1330/TS 330 or department approval required; corequisite: EDU 4620/ED 462

EDU 3680/ED 368
Internship in Career and Technical Education
6 field hrs, 2 cr
A field-based internship experience designed to provide reinforcement for pre-service teacher interns who have completed Methods of Teaching. Students will be required to attend scheduled instructional seminars very early in the semester and will be observed at a school site on at least three occasions by a college supervisor. A mentor teacher will provide ongoing support and guidance between observations. Emphasis is placed on developing valid lesson objectives, effective questioning techniques, and the fundamentals of lesson planning and delivery. Monthly logs, reflective essays, participation in seminars, and a comprehensive assignment based on field experiences are required.
Prerequisites: EDU 2520/ED 252, EDU 2353/ED 353, EDU 2362/ED 362; corequisite: EDU 4620/ED 462 or approval of department chair

EDU 3700/ED 370
Practicum in Occupational Competency: Performance
1 lab hr, 15 cr
Students are required to demonstrate a sufficient level of occupational competency by satisfactorily passing a performance examination in the occupational area for which they are seeking certification. Students can receive only the grade of "Satisfactory" or "Unsatisfactory."
Prerequisite: Appropriate and documented occupational experience and department approval required.

EDU 3720/ED 372
Practicum in Occupational Competency: Written
1 lab hr, 15 cr
Students are required to demonstrate a sufficient level of occupational competency by satisfactorily passing a written examination in the occupational area for which they are seeking certification. Students can receive only the grade of "Satisfactory" or "Unsatisfactory."
Prerequisite: Appropriate and documented occupational experience and department approval required.

EDU 4400/ED 440
Technological Systems II
2 cl hrs, 3 lab hrs, 3 cr
Addresses the "Introduction to 8th Grade Technology" NYS mandate. Hands-on, laboratory-based activities focus on inquiry, science, math, computer applications and social science concepts that underlie technological systems. Emphasis is on impacts of technology and synthesizing the experiences of EDU 3400/ED 340.
Prerequisite: EDU 3400/ED 340

EDU 4420/ED 442
Energy Systems
2 cl hrs, 2 lab hrs, 3 cr
An overview of energy sources, conversion and transmission. Experience will familiarize the student with the technological systems used by society to harness and use energy. Importance of conserving energy is emphasized.
Prerequisites: EDU 3400/ED 340, EDU 3420/ED 342

EDU 4440/ED 444
Electronics and Robotics
2 cl hrs, 2 lab hrs, 3 cr
An introduction to the study of robotics and industrial automation. This course will provide theoretical and hands-on experience in the areas of design, programming, debugging, set-up, and interfacing of industrial robotic applications.
Prerequisites: EDU 2410/ED 241, EDU 3400/ED 340, EDU 3420/ED 342

EDU 4480/ED 448
Principles of Engineering
2 cl hrs, 2 lab hrs, 3 cr
This is a laboratory-based capstone course designed to enable the student teacher to study the relationship among mathematics, science and engineering. Focus is on the integration of the content of these disciplines into the secondary school technology curriculum and to stimulate student interest in pursuing engineering and technology careers.
Prerequisites: MAT 1375/MA 375, CHEM 1210/CH 210 or PHYS 1112/SC 112 or PHYS 1434/SC 434, EDU 3400/ED 340, EDU 3420/ED 342

EDU 2455/ED 455
Methods and Materials for Special Needs Students
3 cl hrs, 3 cr
A review of current methods and materials in working with special needs students. Content includes developmental psychology pertaining to the student population, and preparation of individual education plans.
Prerequisite: None
(open to majors only)

EDU 2457/ED 457
Vocational Guidance for Teachers
3 cl hrs, 3 cr
Overview of career guidance theory; study of application within the secondary schools. Introduction to assessment tools and guidance services. Development of personal career history and objectives, as model for occupational education classroom.
Prerequisite: None
(open to majors only)

EDU 4580/ED 458
Coordination of Diversified Work-Based Learning I: Cooperative Organization
3 cl hrs, 3 cr
Evaluative, procedural and conceptual approaches to organizing a Diversified Cooperative Program within school systems. Emphasis on coordinator's role in construction of training outlines, legal issues and community support.
Prerequisite: Approval of department chair

EDU 4590/ED 459
Coordination of Diversified Work-Based Learning II: Cooperative Operations
3 cl hrs, 3 cr
Implementation of effective program of Diversified Cooperative Work-Study, focusing on student recruitment, placement and supervision, as well as development of employability skills and attitudes.
Prerequisite: Approval of department chair

EDU 4600/ED 460
Professional Development Seminar
2 cl hrs, 2 cr
A series of seminars that accompany the student teaching experience. Seminar topics focus on both the student teaching experience and a broad range of educational issues which form the basis for student reports and reflective essays. The course provides the forum for instruction on special topics mandated in the regents standards for preparing classroom teachers, including identifying and reporting suspected child abuse or maltreatment; preventing child abduction; preventing alcohol, tobacco and other drug abuse; providing safety education; and providing instruction in fire and arson prevention.
Prerequisites: EDU 3600/ED 360 or EDU 3680/ED 368, EDU 2362/ED 362; corequisite: EDU 4870/ED 487

EDU 4620/ED 462
Methods of Teaching in Career and Technology Education II
3 cl hrs, 3 cr
Study of teaching methodologies and instructional strategies. Development of techniques for self-evaluation of instruction.
Prerequisites: EDU 2610/ED 261, EDU 3610/ED 361, EDU 2362/ED 362; corequisite: EDU 3680/ED 368

EDU 4660/ED 466
Supervised/Student Teaching II
9 field hrs, 3 cr
This is the second of two field based supervised/student teaching experiences mandated by the regents. This professional experience is designed to improve and reinforce individual teaching strategies developed during previous field experiences. Must be accompanied by the professional development seminar, written reports and reflective essays. Requires a minimum of 100 hours of supervised classroom experiences (or 9 hours per week). Prior approval of departmental faculty is required and must be obtained one semester in advance.
Prerequisites: EDU 2610/ED 261, EDU 3600/ED 360, EDU 3610/ED 361, EDU 2362/ED 362; corequisite: EDU 4600/ED 460

EDU 4870/ED 487
Supervised/Student Teaching in Career and Technical Education
18 field hrs/wk, 6 cr
A field-based supervised/student teaching experience mandated in the regents' standards for preparing classroom teachers. This professional experience is designed to improve and reinforce individual teaching strategies developed during previous field experiences. Emphasis is on instructional planning, implementation and assessment. Must be accompanied by the professional development seminar, EDU 4600/ED 460. Requires a minimum of 225 hours of supervised classroom experiences (or 18 hours per week). Prior approval of departmental faculty must be obtained one semester in advance.
Prerequisites: EDU 2610/ED 261, EDU 3610/ED 361, EDU 2362/ED 362, EDU 3680/ED 368, EDU 4620/ED 462; corequisite: EDU 4600/ED 460

EDU 4990/ED 499
Independent Study
1-3 cl hrs, 2-6 lab hrs, 1-3 cr
Extensive study and research on particular topic of student interest under the supervision of a faculty member. The student is required to submit a written proposal which includes a description of the project, its duration, educational goals, method of evaluation, and number of credits to be earned.
Prerequisite: Matriculated students only; Requires approval of instructor and/or department chair