NEW YORK CITY COLLEGE OF TECHNOLOGY

OF

THE CITY UNIVERSITY OF NEW YORK

PROPOSAL TO ALIGN TECHNOLOGY EDUCATION CURRICULUM WITH NEW TECHNOLOGY EDUCATION STANDARDS

EFFECTIVE FALL 2024

THE DEPARTMENT OF CAREER AND TECHNOLOGY TEACHER EDUCATION

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New York City College of Technology, CUNY

# CURRICULUM MODIFICATION PROPOSAL FORM

This form is used for all curriculum modification proposals. See the [Proposal Classification Chart](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-09-Proposal_Classification_Chart.pdf) for information about what types of modifications are major or minor. Completed proposals should be emailed to the Curriculum Committee chair.

|  |  |
| --- | --- |
| **Title of Proposal** | **Aligning Technology Education Curriculum with New Technology Education Standards** |
| **Date** | **1/23/2024** |
| **Major or Minor** | **Major** |
| **Proposer’s Name** | **Euisuk Sung** |
| **Department** | **Career and Technology Teacher Education** |
| **Date of Departmental Meeting in which proposal was approved** | **1/23/2024** |
| **Department Chair Name** | **Dr. Hon Jie Teo** |
| **Department Chair Signature and Date** |  |
| **Academic Dean Name** | **Dr. Maureen Archer** |
| **Academic Dean Signature and Date** |  |
| **Brief Description of Proposal**  (Describe the modifications contained within this proposal in a succinct summary. More detailed content will be provided in the proposal body. | The updated K-12 technology education standards, as known as Standards for Technological and Engineering Literacy (ITEEA, 2020), emphasize engineering as a fundamental aspect of technology. Also, recent trends in technology education highlight computer-related topics including computer programming, robotics, artificial intelligence, and information systems. To align with these evolving trends and new standards, the proposed amendments seek to modernize the Technology Teacher Education (BSEd). This includes introducing engineering design and up-to-date computer-related topics.  **Revision 1:**  ~~EDU 2400 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~~  EDU 2401 Introduction to Engineering Design  2cl hrs, 2 lab hrs, 3 cr  Introduction to the engineering design process and the foundation of engineering. Students develop comprehensive understandings of the nature of engineering, design process, design methodologies, and interdisciplinary problem-solving skills for product design. The topics of this course include problem identification, design thinking, and prototyping.  Prerequisite: EDU 1400  **-----------------------------------------------**  **Revision 2**  ~~EDU 2410 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~~  EDU 2430 Programming for Educators  2 cl hrs, 2 lab hrs, 3 cr  Foundations of computer programming for K-12 educators using high-level programing languages. This course introduces essential computer programming concepts including syntax, data types, data structures, functions, arrays, conditional statements, and iterations. Students develop computational thinking through decomposition, generalization, abstraction, pattern recognition, algorithm design, and debugging.  Prerequisite: MAT 1275 or higher  **-----------------------------------------------**  **Revision 3**  ~~EDU 2440 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.~~  ~~Prerequisite: EDU 1400~~  EDU 2441 Material Conversion and Processing  2 cl hrs, 2 lab hrs, 3 cr  Exploration of engineering materials and their conversation into products. This course involves hands-on laboratory experiences to explore fabrication tools, material processing, and product design. Emphasis on advanced fabrication technologies including laser cutting, computer numerical control, and 3D printing.  Prerequisite: EDU 1400  **-----------------------------------------------**  **Revision 4**  ~~EDU 2460 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 CTTE majors only)~~  EDU 2461 Communication Technology and Information Systems  2cl hrs, 3 lab hrs, 3 cr  Development of foundational understandings of information and communication. Explore the components of data, information, and knowledge and their effective transmission modes. The topics include computers and related devices, graphic media, electronic communication, and entertainment technologies. Students develop an understanding of up-to-date communication technologies, including computer networks, the Internet, cybersecurity, the impacts of communication, and artificial intelligence.  Prerequisite: EDU 1400.  **-----------------------------------------------**  **Revision 5**  ~~EDU 3400 Technological Systems~~  ~~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~~  EDU 3430 Computer System Applications  2 cl hrs, 3 lab hrs, 3 cr  Develop problem-solving skills utilizing computer systems. Students develop a fundamental understanding of computer systems for teaching computer technology with an emphasis on secondary education. Topics include computer hardware, operating systems, memory structures, peripheral devices, software, and the impact of computing.  Prerequisite: EDU 2430 or EDU 2461  Minor Revision  Remove CST 2403 from Elective Course  ~~Elective~~  ~~Choose one from EDU 4440 or CST 2403~~  EDU 4440 Electronics and Robotics Systems |
| **Brief Rationale for Proposal**  (Provide a concise summary of why this proposed change is important to the department. More detailed content will be provided in the proposal body). | The International Technology and Engineering Educators Association (ITEEA) introduced updated standards for K-12 Technology and Engineering Education in 2020. These new standards emphasize engineering as a fundamental component of technology education, with a focus on engineering-related concepts such as product design and the engineering design process. As a result, the New York State Education Department (NYSED) has adopted these revised standards.  Furthermore, the field of technology education has evolved, shifting its emphasis from traditional shop-based courses to a greater focus on computer-centric topics. Notably, New York City (NYC) schools are actively seeking program completers who possess competence in computer technologies.  Aligned with these educational trends and the newly adopted standards, this curriculum modification proposes revisions in five key courses. Additionally, it introduces a curriculum update to align with the science course requirements of General Education.  **1. EDU 2401 to Replace EDU 2400**: As engineering design and product development gaining importance in technology education, we propose EDU 2401 Introduction to Engineering Design. This course deliver the foundational knowledge of the engineering design process and the core contents of Design and Drawing for Production (DDP), a course widely taught in high schools with an emphasis on engineering design. The primary emphasis of EDU 2400 was to teach computer-aided design (CAD) and primarily focuses on drawing techniques, has been noted for content overlap with EDU 1400, which also covers CAD  **2. EDU 2430 to Replace EDU 2410**:.As the growing emphasis on computer programming in technology education, we propose EDU 2430 to replace EDU 2410, shifting the educational approach from technological knowledge to computer programming. The contents taught in EDU 2410 has been covered by EDU 3410 Technology Education Foundation and Curriculum Development and other system classes.  **3. EDU 2441 to Replace EDU 2440**: While EDU 2440 Manufacturing Technology has emerged as a significant focus in technology education in 1980s. However, the recent shifts in technology education priorities towards design, engineering, and computing have made material conversion and processing pivotal concepts (ITEEA, 2020). In alignment with this, STEL replaced Material Conversion and Process with Manufacturing Systems. EDU 2441 will, therefore, emphasize materials, processing, and engineering design.  **4. EDU 2461 to Replace EDU 2460**: Since EDU 2460 Communications Systems are a rapidly changing area, it is necessary to revise the contents according to the latest trends, and a discrepancy between its contact hours (6 hours) and contents has been reported. While EDU 2460 has focused on technical aspects such as CAD, photo, audio, and video that overlap with EDU 1400, STEL, the new technology education standards, prioritize communication and information, focusing on data literacy, the Internet, the latest communication means, and computers. EDU 2461 will emphasize on up-to-date communication technology, information literacy, and data management presented by the NYS computer science and digital fluency standards.  **5. EDU 3430 to Replace EDU 3400**: Historically, the Jackson's Mill Curriculum Project (Snyder & Hales, 1980) and Standards for Technological Literacy (ITEEA, 2000) emphasized the systems approach in technology education. EDU 3400 was structured accordingly to introduce the general concept of systems. However, as problem-solving, engineering design, and computer integration have risen to prominence in K-12 technology education curricula, we propose EDU 3430 to teach foundational knowledge of computer, data literacy, and computer applications.  **6. Minor Revision**  CST 2430 was an elective course, and students choose CST 2430 or EDU 4440 Electronics and Robotics Systems. However, many CTTE students were unable to take CST 2430 due to not meeting its prerequisite, CST 1100. Also, electronics and robotics are becoming essential for technology teachers, and we propose a new programming course, EDU 2430 Programming for Educators. By eliminating CST 2430 and introducing EDU 2430, CTTE students will have access to a programming course and learn robotics and electronics.  These revisions are proposed with the intent of modernizing the technology teacher education curriculum and aligning it with recent education standards and industry needs. |
| **Proposal History**  (Please provide history of this proposal: is this a resubmission? An updated version? This may most easily be expressed as a list). |  |

# ALL PROPOSAL CHECK LIST

|  |  |
| --- | --- |
| Completed CURRICULUM MODIFICATION FORM including: |  |
| * Brief description of proposal | V |
| * Rationale for proposal | V |
| * Date of department meeting approving the modification | V |
| * Chair’s Signature | V |
| * Dean’s Signature | V |
| Evidence of consultation with affected departments  List of the programs that use this course as required or elective, and courses that use this as a prerequisite. | V |
| Documentation of Advisory Commission views (if applicable). |  |
| Completed [Chancellor’s Report Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-09-Chancellor_Report_Quick_Reference_Guide1.doc). |  |

**EXISTING PROGRAM MODIFICATION PROPOSALS**

|  |  |
| --- | --- |
| Documentation indicating core curriculum requirements have been met for new programs/options or program changes. | V |
| Detailed rationale for each modification (this includes minor modifications) | V |

# Side by Side Comparison Chart

| **Current TE BSEd Curriculum** | | | **Proposed TE BSEd Curriculum** | | |
| --- | --- | --- | --- | --- | --- |
| **General Education Required and Flexible Common Core (60 credits)** | | | | | |
| Course | Course Title | Credits | Course | Course Title | Credits |
| ENG 1101 | English Composition: English Composition I | 3 | ENG 1101 | English Composition: English Composition I | 3 |
| ENG 1121 | English Composition: English Composition II | 3 | ENG 1121 | English Composition: English Composition II | 3 |
| MAT 1275 or higher | College Algebra and Trig. | 4 | MAT 1275 or higher | College Algebra and Trig. | 4 |
| **~~PHYS 1111 or higher~~** | **~~Principles of Science I~~** | **~~4~~** |  | **Life and Physical Sciences (LPS)** | **3** |
| **~~PHYS 1112 or higher~~** | **~~Principles of Science II~~** | **~~4~~** |  | **Scientific World (SW)** | **3** |
|  | World Culture and Global Issues | 3 |  | World Culture and Global Issues | 3 |
|  | US Experience in its Diversity | 3 |  | US Experience in its Diversity | 3 |
|  | Creative Expression | 3 |  | Creative Expression | 3 |
|  | Additional Flexible Common Core Course | 3 |  | Additional Flexible Common Core Course | 3 |
| SOC 1101 | Elements of Sociology | 3 | SOC 1101 | Elements of Sociology | 3 |
| PSY 1101 | Intro to Psychology | 3 | PSY 1101 | Intro to Psychology | 3 |
| COM 1330 or higher | Speech/Oral Communication: Public Speaking | 3 | COM 1330 or higher | Speech/Oral Communication: Public Speaking | 3 |
|  | Interdisciplinary Course | 3 |  | Interdisciplinary Course | 3 |
|  | Additional Liberal Arts | 3 |  | Additional Liberal Arts | 3 |
| MAT 1375 | Pre-calculus | 4 | MAT 1375 | Pre-calculus | 4 |
| PSY 2501/ EDU 2610 | Child and Adolescent Development | 3 | PSY 2501/ EDU 2610 | Child and Adolescent Development | 3 |
| PSY 3502/ EDU 3610 | Human Learning & Instruction | 3 | PSY 3502/ EDU 3610 | Human Learning & Instruction | 3 |
| SOC 2380 | Sociology of Education | 3 | SOC 2380 | Sociology of Education | 3 |
|  | Elementary Language l (ARB, ASL,CHN,FREN, SPA) | 3 |  | Elementary Language l (ARB, ASL,CHN,FREN, SPA) | 3 |
| LIB 1201 | Research and Doc. In the Information Age | 3 | LIB 1201 | Research and Doc. In the Information Age | 3 |
| **Program-specific degree requirements (63 credits)** | | | | | |
| EDU 2362 | Methods of Teaching in Career & Technology Teacher Ed. | 3 | EDU 2362 | Methods of Teaching in Career & Technology Teacher Ed. | 3 |
| EDU 2455 | Methods and Materials for Special Needs | 3 | EDU 2455 | Methods and Materials for Special Needs | 3 |
| EDU 3410 | Tech. Ed. Foundations & Curriculum Development | 3 | EDU 3410 | Tech. Ed. Foundations & Curriculum Development | 3 |
| EDU 3630 | Assessing Student Learning Outcomes | 3 | EDU 3630 | Assessing Student Learning Outcomes | 3 |
| EDU 3640 | Computers in Education | 3 | EDU 3640 | Computers in Education | 3 |
| EDU 3670 | Meth. Of Literacy Instruction in CTE | 3 | EDU 3670 | Meth. Of Literacy Instruction in CTE | 3 |
| EDU 3681 | Internship in Career & Technology Teacher Ed | 1 | EDU 3682 | Internship in Career & Technology Teacher Ed | 1 |
| EDU 4600 | Professional Development Seminar | ~~1~~ | **EDU 4602** | **Teacher Preparation Development Seminar** | **3** |
| EDU 4871 | Supervised Student Teaching in Career & Tech Ed. | 6 | EDU 4872 | Supervised Student Teaching in Career & Tech Ed. | 6 |
| EDU 1400 | Design and Drafting I | 2 | EDU 1400 | Design and Drafting I | 2 |
| EDU 1420 | Construction Systems | 3 | EDU 1420 | Construction Systems | 3 |
| **~~EDU 2400~~** | **~~Design and Drafting II~~** | **~~2~~** | **EDU 2401** | **Introduction to Engineering Design** | **3** |
| **~~EDU 2410~~** | **~~Survey of Technological Development~~** | **~~3~~** | **EDU 2430** | **Programming for Educators** | **3** |
| **~~EDU 2440~~** | **~~Manufacturing Systems~~** | **~~3~~** | **EDU 2441** | **Material Conversion and Processing** | **3** |
| **~~EDU 2460~~** | **~~Communications Systems~~** | **~~4~~** | **EDU 2461** | **Communication Technology and Information Systems** | **3** |
| **~~EDU 3400~~** | **~~Technological Systems I~~** | **~~3~~** | **EDU 3430** | **Computer System Applications** | **3** |
| EDU 3420 | Electronic Systems | 4 | EDU 3420 | Electronic Systems | 4 |
| EDU 3440 | Transportation Systems | 3 | EDU 3440 | Transportation Systems | 3 |
| EDU 4480 | Principles of Engineering | 3 | EDU 4480 | Principles of Engineering | 3 |
| Elective  CST 2403  Or  EDU 4440 | Introductory C Language Programming  or  Electronic and Robotic Systems | 3 | ~~Elective~~  ~~CST 2403~~  ~~Or~~  EDU 4440 | ~~Introductory C Language Programming~~  ~~or~~  Electronic and Robotic Systems | 3 |
| EDU 4440 |  | 3 | EDU 4440 | Electronic and Robotic Systems | 3 |
| Total | | 123 | Total | | 123 |

# Appendix A. EDU 2401 Introduction to Engineering Design

## EDU 2401 New Course Proposal Form

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

This form is used for all new course proposals. Attach this to the [Curriculum Modification Proposal Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-10-Curriculum_Modification_Proposal_Form.docx) and submit as one package as per instructions. Use one New Course Proposal Form for each new course.

|  |  |
| --- | --- |
| **Course Title** | Introduction to Engineering Design |
| **Proposal Date** | 1/23/2024 |
| **Proposer’s Name** | Euisuk Sung |
| **Course Number** | EDU 2401 |
| **Course Credits, Hours** | 3 cr, 2 cl hrs, 2 lab hrs |
| **Course Pre / Co-Requisites** | Prerequisite EDU 1400 |
| **Catalog Course Description** | Introduction to the engineering design process and the foundation of engineering. Students develop comprehensive understandings of the nature of engineering, design process, design methodologies, and interdisciplinary problem-solving skills for product design. The topics of this course include problem identification, design thinking, and prototyping. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | EDU 2401 introduces technology teacher education students to the fundamentals of engineering design, creative problem-solving, and design thinking. The course elucidates the human-centric aspects of design in technology and engineering, emphasizing its unique characteristics. Students will engage in real-world problem-solving that is open-ended, adheres to specific requirements, and is iterative and creative. This process mirrors the intrinsic nature of engineering design, where numerous potential solutions can emerge. Furthermore, the course emphasizes the cultivation of 21st-century skills such as creativity, critical thinking, communication, and collaboration within product design and development frameworks.  This course aligns with the NYS technology education standards, MST 5-Engineering Design, and the international benchmarks, Standards for Technological and Engineering Literacy (STEL) 7-Design in Technology and Engineering Education:  - MST 5- Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.  - ITEEA STEL 7 Design in Technology and Engineering Education: Students experience the full spectrum of technology and engineering design. |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | None |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | None |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | N/A |
|  |
|  |
| **Intent to Submit as a Writing Intensive Course** | N/A |

**NEW COURSE PROPOSAL CHECK LIST**

Use this checklist to ensure that all required documentation has been included. You may wish to use this checklist as a table of contents within the new course proposal.

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | Y |
| * Brief Rationale | Y |
| * CUNY – Course Equivalencies | Y |
| Completed [Library Resources and Information Literacy Form](https://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form-rev3F16.doc) |  |
| **Course Outline**  Include within the outline the following. |  |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | Y |
| Prerequisites/Co- requisites | Y |
| Detailed Course Description | Y |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | Y |
| Example Weekly Course outline | Y |
| Grade Policy and Procedure | Y |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | Y |
| Library resources and bibliography | Y |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. |  |
| Target Students who will take this course. Which programs or departments, and how many anticipated?  Documentation of student views (if applicable, e.g. non-required elective). |  |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. |  |
| If additional physical resources are required (new space, modifications, equipment), description of these requirements. If applicable, Memo or email from the VP for Finance and Administration with written comments regarding additional and/or new facilities, renovations or construction. |  |
| Where does this course overlap with other courses, both within and outside of the department? |  |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? |  |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. |  |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | Y |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | Y |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | Y |
| How does this course support Programmatic Learning Outcomes? | Y |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | N |
| **Additional Forms for Specific Course Categories** |  |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) |  |
| Interdisciplinary Committee Recommendation (if applicable and if received)\*  \*Recommendation must be received before consideration by full Curriculum Committee |  |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) |  |
| Writing Intensive Form if course is intended to be a WIC (under development) |  |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. |  |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** |  |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). |  |
| Established Timeline for Curricular Experiment |  |

## EDU 2401 Course Syllabus

**New York City College of Technology**

**Department of Career and Technology Teacher Education**

Course Number: **EDU-2401**  Title: Introduction to Engineering Design

Credit Hours: 3 (2cl, 2 lab hrs) Class Meeting Times:

Instructor: Classroom:

Email: Office:

Office Phone: Office Hours:

**Course Description**

Introduction to the engineering design process and the foundation of engineering. Students develop comprehensive understandings of the nature of engineering, design process, design methodologies, and interdisciplinary problem-solving skills for product design. The topics of this course include problem identification, design thinking, and prototyping. Prerequisites: EDU 1400

**Learning Outcomes**

After successful completion of this course, you will be able to:

1. Design a product/system using the engineering design process to address a specific problem.
2. Document the engineering design process employed to create a design solution.
3. Define user-centered, precise, and quantifiable design criteria.
4. Use appropriate brainstorming strategies to produce design ideas.
5. Develop a testing protocol to evaluate an aspect of an engineering solution or design.
6. Deliver a technical presentation articulating a solution to a mechanical challenge or product design.
7. Collaborate within a design team to conceptualize and develop solutions.
8. Integrate other academic disciplines with the study of transportation technology.
9. Develop activities for use with students in engineering design courses at either the elementary, middle, or high school level.

**Course Materials**

Cross, N. (2021). Engineering Design Methods: Strategies for Product Design (5th eds). San Francisco, CA: Jossey-Bass. ISBN: 1119724376

**Technology Requirements**

The PowerPoint lecture presentations, links to articles, assignments, quizzes, and rubrics are located on the Blackboard site for the course. To participate in learning activities and complete assignments, you will need:

* Access to a working computer that has a current operating system with updates installed, plus speakers or headphones to hear lecture presentations (transcripts provided);
* Reliable Internet access and a USC email account;
* A current Internet browser that is compatible with Blackboard (Google Chrome is the recommended browser for Blackboard);
* Microsoft Word or Google Docs as your word processing program; and
* Reliable data storage for your work, such as a USB drive or Office365 OneDrive cloud storage.

**Attendance/Participation**

* You will earn 0-10 points per class within the following guidelines. This policy begins in the first class.
* 10 points are awarded to students who are on time, stay on task, contribute to the overall class discussions, and complete all required activities during each class.
* 9-1 points are awarded for students who arrive late, do not stay on topic, and come to class unprepared to engage in class discussions.
* 0 points were awarded for absence from class.
* Students are allowed **no more than two (2) absences**. Absences in excess of this will lower the final grade by one full letter grade.
* All students should attend the class on time. Two late days represent one absence.

Please Note: **The instructor has the right to award any point value between 1-10 following the above guidelines.**

**Excused Absence**

* An excused absence must be pre-approved by the instructor.
* Medical absences will only be awarded when the student provides a Drs. note based on appropriate situations.
* Only documented emergencies or unavoidable events will be excused.

**Course Assignments and Grading**

| Assignment Weights | Percent |
| --- | --- |
| Class participation | 10% |
| Hands-on Projects | 20% |
| Midterm Exam | 10% |
| Final Exam | 20% |
| Final Project | 30% |
| Total | 100% |

**Grading System**

100-93: A 92.9-90: A- 89.9-87: B+ 86.9-83: B 82.9-80: B-

79.9-77: C+ 76.9-73: C 72.9-70: C- 69.9-60: D Below 60: F

**Safety**

* All safety procedures and rules outlined apply to this class's members.
* Approved eye protection devices must be worn when using any power equipment in the laboratory, if applicable.
* Students should wear eye protection gear while working on hands-on tasks.
* No food or drink should be brought into the fabrication lab.
* After a lab activity, all students are responsible for cleaning the lab.
* If you are not confident using a particular machine or tool, you should immediately stop using it and report to the instructor.

**Students With Special Needs**

Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Students Support Services (OSSS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student’s eligibility from OSSS, which is located in Room A-P508. It is the student’s responsibility to initiate contact with the OSSS staff and to follow the established procedures to send the accommodation notice to the instructor.

Course Schedule

|  |  |  |
| --- | --- | --- |
| Week | Topics & Readings | Lab activates |
| 1 | Nature of design: design activities, design problem, problem structures | Lab safety |
| 2 | Design ability: What designers say, how designers think, learning to design | Material science |
| 3 | The design process: descriptive models, prescriptive models, an integrative model  Design procedures | Sketching techniques |
| 4 | Identifying opportunities: the user scenarios method | Designing a pencil case: ideation |
| 5 | Clarifying objectives: the objective three method | Designing a pencil case: sketching |
| 6 | Establishing functions: the function analysis method | Designing a pencil case: prototyping |
| 7 | Setting requirements: the performance specification method | Designing a pencil case: evaluation |
| 8 | **[Midterm exam]** | |
| 9 | Determining characteristics: the quality function deployment method | 3D printing & laser engraver practice |
| 10 | Generating Alternatives: the morphological chart method | Designing a phone stand: ideation |
| 11 | Evaluating alternatives: the weighted objectives method | Designing a phone stand: sketching |
| 12 | Improving details: the value engineering method | Designing a phone stand: prototyping |
| 13 | Design strategies: frameworks for action, strategy control, setting strategies and choosing tactics | Final project ideation |
| 14 | Product development: product design, product planning, product innovation | Final project sketching & prototyping |
| 15 | **Final exam** | |

Hands-on activity rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Category | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| Project Quality | (10)  Absent/missing | (24)  Student disregards details and work is sloppy; improver tools, materials, and processes were used on majority of project; minimum effort shown; | (26)  Details were overlooked and project lacks quality; proper tools, materials, and processes were used on half of the project | (28)  Meets expectations for students’ skill level;  Not superior, but advanced quality and attention to detail evident; proper tools, materials, and processes used on majority of project | (30)  Exceeds expectations;  Superior quality and attention to detail is evident; proper tools, materials, and processes used to entire project; |
| Lab Report | (5)  Absent/missing | (14)  Some of process, technique, knowledge, and reflection learned from the project are recorded; but minimum effort shown | (16)  The process, technique, knowledge, and reflection learned from the project are recorded; but some are missing; but little effort shown | (18)  The process, technique, knowledge, and reflection learned from the project are recorded, and some are missing | (20)  The process, technique, knowledge, and knowledge learned from the project are recorded. |
| Bonus points | | | | | |
| Originality and creativity | (+0)  Absent/missing | (+2)  Student adapts existing ideas, but little was modified | (+3)  Student adopts existing ideas, but modified some; limited originality shown | (+4)  Student adapts existing ideas, but modified to create his/her own design; some originality shown | (+5)  Now and innovative approach to the topic; student has created own design and product |

Academic Integrity Pledge

I understand the value of personal integrity and ethical behavior in all aspects of my professional and personal life. By committing to honesty and personal responsibility, I earn respect and trust of others. As a student at New York City College of Technology, I recognize that the value of my education is not just being able to say I am a college graduate but also incorporating the skills, deals, and knowledge I have acquired. I thus commit myself to upholding academic integrity as an important aspect of my personal integrity. I understand that academic integrity includes:

1. Fully observing the rules governing exams and assignments regarding resource material, electronic aids, copying, collaborating with others, or engaging in any other behavior that subverts the purpose of the exam or assignment, and the directions of the instructor.
2. Only turning in work that I have done myself, and not using unattributed work done by others. While working and studying with others can be an effective way to learn, submitted work will be my own.
3. Giving full and proper credit to sources and references, and acknowledging the contributions and ideas of others, in my academic work.

*I have read and understand the Academic Integrity Policy found in the New York City College of Technology College Catalog*

Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Course, section \_EDU 2401, D001\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Modified from the Marquette University Honor Code, PB, RB; AM; 12/23/20

**Bibliography**

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New York State Education Department. (2000). *Design and drawing for production syllabus*. Available from <https://www.nysed.gov/career-technical-education/design-and-drawing-production-ddp>

## EDU 2401 Learning Outcomes and Assessment Methods

**Learning Outcomes and Assessment Methods**

EDU 2401 Introduction to Engineering Design

Career and Technology Teacher Education (CTTE)

|  |  |
| --- | --- |
| LEARNING OUTCOMES | ASSESSMENT METHODS |
| 1. Design a product/system using the engineering design process to address a specific problem. | Evaluation of student work in design activities. |
| 2. Document the engineering design process employed to create a design solution. | Analysis of individual design notebooks related to related to the design assignments. |
| 3. Define user-centered, precise, and quantifiable design criteria. | Analysis of the written report for problem identification. |
| 4. Use appropriate brainstorming strategies to produce design ideas. | Observation and analysis of group activities for the idea generation of the engineering design process. |
| 5. Develop a testing protocol to evaluate an aspect of an engineering solution or design. | Analysis of written report, learning log, and design notebooks. |
| 6. Deliver a technical presentation articulating a solution to a mechanical challenge or product design. | Analysis of group presentation for design challenges. |
| 7. Collaborate within a design team to conceptualize and develop solutions. | Observation of group performance and collaboration. |
| 8. Integrate other academic disciplines with the study of transportation technology. | Analysis of written report for design activities. |
| 9. Develop activities for use with students in engineering design courses at either the elementary, middle, or high school level. | Evaluation of individual lesson developments at the elementary, middle, or high school level. |

# Appendix B. EDU 2430 Programming for Educators

## EDU 2430 New Course Proposal Form

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

This form is used for all new course proposals. Attach this to the [Curriculum Modification Proposal Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-10-Curriculum_Modification_Proposal_Form.docx) and submit as one package as per instructions. Use one New Course Proposal Form for each new course.

|  |  |
| --- | --- |
| **Course Title** | Programming for Educators |
| **Proposal Date** | 01/23/2024 |
| **Proposer’s Name** | Euisuk Sung |
| **Course Number** | EDU 2430 |
| **Course Credits, Hours** | 2 cl hrs, 2 lab hrs, 3 cr |
| **Course Pre / Co-Requisites** | MAT 1275 or higher |
| **Catalog Course Description** | Foundations of computer programming for K-12 educators using high-level programing languages. This course introduces essential computer programming concepts including syntax, data types, data structures, functions, arrays, conditional statements, and iterations. Students develop computational thinking through decomposition, generalization, abstraction, pattern recognition, algorithm design, and debugging. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | As the growing emphasis on computer programming in technology education, we propose EDU 2430 to replace EDU 2410, shifting the educational approach from knowledge oriented technological systems to computer programming.  As the importance of information, robots, and computers increases, there is a growing demand for emphasis on related education in technology education. Particularly, since New York City’s schools focus on computer-related content such as computers, coding, robotics, and networks, EDU 2430 will focus on computer, information, and communication technologies-based problem-solving activities.  This course will be aligned with ITEEA Standards TEC-1 Computation, Automation, Artificial Intelligence, and Robotics in International Technology Engineering Educators Association's Standards for Technological and Engineering Literacy (ITEEA, 2020) |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | None |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | N/A |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | N/A |
|  |
|  |
| **Intent to Submit as a Writing Intensive Course** | No |

**NEW COURSE PROPOSAL CHECK LIST**

Use this checklist to ensure that all required documentation has been included. You may wish to use this checklist as a table of contents within the new course proposal.

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | Y |
| * Brief Rationale | Y |
| * CUNY – Course Equivalencies | Y |
| Completed [Library Resources and Information Literacy Form](https://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form-rev3F16.doc) |  |
| **Course Outline**  Include within the outline the following. |  |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | Y |
| Prerequisites/Co- requisites | Y |
| Detailed Course Description | Y |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | Y |
| Example Weekly Course outline | Y |
| Grade Policy and Procedure | Y |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | Y |
| Library resources and bibliography | Y |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. |  |
| Target Students who will take this course. Which programs or departments, and how many anticipated?  Documentation of student views (if applicable, e.g. non-required elective). |  |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. |  |
| If additional physical resources are required (new space, modifications, equipment), description of these requirements. If applicable, Memo or email from the VP for Finance and Administration with written comments regarding additional and/or new facilities, renovations or construction. |  |
| Where does this course overlap with other courses, both within and outside of the department? |  |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? |  |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. |  |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | Y |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | Y |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | Y |
| How does this course support Programmatic Learning Outcomes? | Y |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | N |
| **Additional Forms for Specific Course Categories** |  |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) |  |
| Interdisciplinary Committee Recommendation (if applicable and if received)\*  \*Recommendation must be received before consideration by full Curriculum Committee |  |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) |  |
| Writing Intensive Form if course is intended to be a WIC (under development) |  |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. |  |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** |  |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). |  |
| Established Timeline for Curricular Experiment |  |

## EDU 2430 Course Syllabus

**New York City College of Technology**

**Department of Career and Technology Teacher Education**

Course Number: **EDU-2430**  Title: Programming for Educators

Credit Hours: 3 (2cl, 2 lab hrs) Class Meeting Times:

Instructor: Classroom:

Email: Office:

Office Phone: Office Hours:

**Course Description**

Foundations of computer programming for K-12 educators using high-level programing languages. This course introduces essential computer programming concepts including syntax, data types, data structures, functions, arrays, conditional statements, and iterations. Students develop computational thinking through decomposition, generalization, abstraction, pattern recognition, algorithm design, and debugging.

Prerequisite: MAT 1275 or higher

#### Learning Outcomes

After successful completion of this course, you will be able to:

1. Apply knowledge and techniques of computer programming for problem-solving.
2. Demonstrates knowledge of characteristics of various programming paradigms (e.g., functional, procedural, object-oriented).
3. Applies knowledge of data types; the use of variables, objects, and classes in different contexts; and data structures (i.e., one- and two-dimensional arrays, associative arrays, and lists).
4. Use syntax and program structure.
5. Utilize conditional execution with if, elif, and else.
6. Design basic looping logic to apply iterative patterns.
7. Design and use functions and function invocation, including global function, object function, parameter/argument, and return values.
8. Demonstrates knowledge of common programming errors and methods for systematically testing and debugging programs.
9. Applies knowledge of structuring code for performance, styling code for readability, and documenting code for reference.

#### Course Materials

Gaddis, T. (2021). Introduction to Computation and Programming Using Python: With Application to Understanding Data (The MIT Press). ISBN: 0262529629

Computer: For this course, you should have a reliable computer on which you can write, run, and debug code. Windows≥11 and MacOS≥ 12.0 are supported.

Software: You will be writing programs in Python, and accordingly you should have a reasonably current version of Python installed on your computer (e.g., version≥3.7.0). Python source code is in plain-text format, and you may write and edit Python code with any plain-text editor (e.g., Sublime or similar). However, it’s helpful to use an integrated development environment (IDE). An IDE provides additional functionality not available with a plain-text editor (syntax high lighting, debugging, etc.). Recommended IDEs:

* Thonny, Python IDE for beginners: <https://thonny.org/>
* IDLE, Python’s integrated development and learning environment: <https://python.org/>

#### Attendance/Participation

* You will earn 0-10 points per class within the following guidelines. This policy begins in the first class.
* 10 points are awarded to students who are on time, stay on task, contribute to the overall class discussions, and complete all required activities during each class.
* 9-1 points are awarded for students who arrive late, do not stay on topic, and come to class unprepared to engage in class discussions.
* 0 points were awarded for absence from class.
* Students are allowed **no more than two (2) absences**. Absences in excess of this will lower the final grade by one full letter grade.
* All students should attend the class on time. Two late days represent one absence.

Please Note: **The instructor has the right to award any point value between 1-10 following the above guidelines.**

#### Excused Absence

* An excused absence must be pre-approved by the instructor.
* Medical absences will only be awarded when the student provides a Drs. note based on appropriate situations.
* Only documented emergencies or unavoidable events will be excused.

#### Course Assignments and Grading

| Assignment Weights | Percent |
| --- | --- |
| Class participation | 10% |
| Weekly coding assignments | 30% |
| Individual programming projects  2 projects each 10% | 20% |
| Midterm Exam | 20% |
| Final Exam | 20% |
| Total | 100% |

#### Grading System

100-93: A 92.9-90: A- 89.9-87: B+ 86.9-83: B 82.9-80: B-

79.9-77: C+ 76.9-73: C 72.9-70: C- 69.9-60: D Below 60: F

#### Homework assignments

All weekly assignments should be completed and submitted by the announced deadline. To complete the programming assignments you need to write, debug, and submit Python program code solving a specific task. Programming assignments has to be submitted online through the Blackboard. All submitted work should bear the number of the assignment and the author's name inside the program header comment. You will lose 0.1 point for every solution that lacks the header comment with this data. By submitting work under your name, you are indicating that you have completed the assignment.

#### Program evaluation criteria

* Program correctness - 60%
* Documentation - 20%
* Readability - 20%

#### Students With Special Needs

Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Students Support Services (OSSS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student’s eligibility from OSSS, which is located in Room A-P508. It is the student’s responsibility to initiate contact with the OSSS staff and to follow the established procedures to send the accommodation notice to the instructor.

#### Course Schedule

|  |  |
| --- | --- |
| Week | Topics & Readings |
| 1 | Introduction to computers and programming |
| 2 | Input, processing, and output |
| 3 | Branching, flow control, and Boolean logic |
| 4 | Repetition structures: while, for loops |
| 5 | Functions 1: defining and calling functions, passing arguments |
| 6 | Functions 2: Value-return, global variables, and built-in functions |
| 7 | Debugging, review, and prep midterm exam |
| 8 | **[Midterm exam]** |
| 9 | Files and exceptions |
| 10 | Handling exceptions |
| 11 | Lists and tuples |
| 12 | Handling strings |
| 13 | Dictionaries and sets |
| 14 | Review and prep final exam |
| 15 | **Final exam** |

Academic Integrity Pledge

I understand the value of personal integrity and ethical behavior in all aspects of my professional and personal life. By committing to honesty and personal responsibility, I earn respect and trust of others. As a student at New York City College of Technology, I recognize that the value of my education is not just being able to say I am a college graduate but also incorporating the skills, deals, and knowledge I have acquired. I thus commit myself to upholding academic integrity as an important aspect of my personal integrity. I understand that academic integrity includes:

1. Fully observing the rules governing exams and assignments regarding resource material, electronic aids, copying, collaborating with others, or engaging in any other behavior that subverts the purpose of the exam or assignment, and the directions of the instructor.
2. Only turning in work that I have done myself, and not using unattributed work done by others. While working and studying with others can be an effective way to learn, submitted work will be my own.
3. Giving full and proper credit to sources and references, and acknowledging the contributions and ideas of others, in my academic work.

*I have read and understand the Academic Integrity Policy found in the New York City College of Technology College Catalog*

Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Course, section \_EDU 2430, D001\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Modified from the Marquette University Honor Code, PB, RB; AM; 12/23/20

## EDU 2430 Learning Outcomes and Assessment Methods

EDU 2430 Computer Programming for Educators

Career and Technology Teacher Education (CTTE)

|  |  |
| --- | --- |
| LEARNING OUTCOMES | ASSESSMENT METHODS |
| 1. Apply knowledge and techniques of computer programming for problem-solving. | Evaluation of individual student of programming assignments. |
| 2. Demonstrates knowledge of characteristics of various programming paradigms (e.g., functional, procedural, object-oriented) | Evaluation of individual student knowledge from quizzes and exams. |
| 3. Applies knowledge of data types; the use of variables, objects, and classes in different contexts; and data structures (i.e., one- and two-dimensional arrays, associative arrays, and lists) | Analysis of student performance in programming assignments. |
| 4. Use syntax and program structure. | Analysis of student performance in programming assignments. |
| 5. Utilize conditional execution with if, elif, and else | Analysis of student performance in programming assignments. |
| 6. Design basic looping logic to apply iterative patterns. | Analysis of student performance in programming assignments. |
| 7. Design and use functions and function invocation, including global function, object function, parameter/argument, and return values | Analysis of student performance in programming assignments. |
| 8. Demonstrates knowledge of common programming errors and methods for systematically testing and debugging programs | Evaluation of the written report and performance analysis in programming assignments. |
| 9. Applies knowledge of structuring code for performance, styling code for readability, and documenting code for reference | Evaluation of the written report and performance analysis in programming assignments. |

# Appendix C. EDU 2441 Material Conversion and Processing

## EDU 2441 New Course Proposal Form

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

This form is used for all new course proposals. Attach this to the [Curriculum Modification Proposal Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-10-Curriculum_Modification_Proposal_Form.docx) and submit as one package as per instructions. Use one New Course Proposal Form for each new course.

|  |  |
| --- | --- |
| **Course Title** | Material Conversion and Processing |
| **Proposal Date** | 1/23/2024 |
| **Proposer’s Name** | Euisuk Sung |
| **Course Number** | EDU 2441 |
| **Course Credits, Hours** | 2 cl hrs, 2 lab hrs, 3 cr |
| **Course Pre / Co-Requisites** | EDU 1400 |
| **Catalog Course Description** | Exploration of engineering materials and their conversation into products. This course involves hands-on laboratory experiences to explore fabrication tools, material processing, and product design. Emphasis on advanced fabrication technologies including laser cutting, computer numerical control, and 3D printing. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | Manufacturing technology played a very important role in the industrial-based technology education curriculum until the 1990s. However, as technology education adopted engineering as a core platform to prepare for 21st-century industry (STEL, ITEEA, 2020), the focus has been moved from traditional manufacturing, producing mass products, to materials and their conversion. EDU 2440 focused on metalworking and manufacturing systems, including machine cutting, forming, joining, and basic machine tool operations. However, the presented course EDU 2460 emphasizes on the tools, machinery, and material conversion used in manufacturing through lab activities. Students will learn up-to-date fabrication processes such as 3D printing, laser cutting, and rapid prototyping.  The core contents of this course are aligned with the international standards, Standards for Technological and Engineering Literacy (STEL) TEC-2: Material Conversion and Processing. |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | None |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | None |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | N/A |
|  |
|  |
| **Intent to Submit as a Writing Intensive Course** | No |

**NEW COURSE PROPOSAL CHECK LIST**

Use this checklist to ensure that all required documentation has been included. You may wish to use this checklist as a table of contents within the new course proposal.

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | Y |
| * Brief Rationale | Y |
| * CUNY – Course Equivalencies | Y |
| Completed [Library Resources and Information Literacy Form](https://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form-rev3F16.doc) | Y |
| **Course Outline**  Include within the outline the following. |  |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | Y |
| Prerequisites/Co- requisites | Y |
| Detailed Course Description | Y |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | Y |
| Example Weekly Course outline | Y |
| Grade Policy and Procedure | Y |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | Y |
| Library resources and bibliography | Y |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. |  |
| Target Students who will take this course. Which programs or departments, and how many anticipated?  Documentation of student views (if applicable, e.g. non-required elective). |  |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. |  |
| If additional physical resources are required (new space, modifications, equipment), description of these requirements. If applicable, Memo or email from the VP for Finance and Administration with written comments regarding additional and/or new facilities, renovations or construction. |  |
| Where does this course overlap with other courses, both within and outside of the department? |  |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? |  |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. |  |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | Y |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | Y |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | Y |
| How does this course support Programmatic Learning Outcomes? | Y |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | N |
| **Additional Forms for Specific Course Categories** |  |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) |  |
| Interdisciplinary Committee Recommendation (if applicable and if received)\*  \*Recommendation must be received before consideration by full Curriculum Committee |  |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) |  |
| Writing Intensive Form if course is intended to be a WIC (under development) |  |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. |  |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** |  |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). |  |
| Established Timeline for Curricular Experiment |  |

## EDU 2441 Course Syllabus

**New York City College of Technology**

**Department of Career and Technology Teacher Education**

Course Number: **EDU-2441**  Title: Material Conversion and Processing

Credit Hours: 3 (2cl, 2 lab hrs) Class Meeting Times:

Instructor: Classroom:

Email: Office:

Office Phone: Office Hours:

#### Course Description

Exploration of engineering materials and their conversation into products. This course involves hands-on laboratory experiences to explore fabrication tools, material processing, and product design. Emphasis on advanced fabrication technologies including laser cutting, computer numerical control, and 3D printing.

Prerequisite: EDU 1400

#### Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Demonstrate a comprehensive understanding of the historical evolution of material conversion and processing techniques.
2. Identify appropriate materials essential for effective engineering design, considering their properties and characteristics.
3. Apply acquired knowledge and techniques to transform raw materials into secondary components.
4. Analyze and showcase a diverse array of material processing and conversion methods, highlighting their respective advantages and limitations.
5. Evaluate the products resulting from material processing, while assessing their broader implications and environmental impacts.
6. Set up and operate a range of material processing tools, including the jointer, surface planer, table saw, power miter saw, bandsaw, sander, and drill press, with utmost attention to safety.
7. Apply problem-solving and analytical skills to engineering design problems for laboratory activities.
8. Communicate concepts and techniques for the secure utilization of material processing equipment, ensuring comprehensive understanding among learners.
9. Display an in-depth understanding of the secure operation of machinery, tools, and materials, promoting a culture of safety within engineering environments.

#### Course Materials

Brown, R. A, Berkeihiser, M., & Wright, R. T. (2022). Exploring Design, Technology & Engineering (4th eds). ISBN: 978-1-68584-247-5

#### Attendance/Participation

* You will earn 0-10 points per class within the following guidelines. This policy begins in the first class.
* 10 points are awarded to students who are on time, stay on task, contribute to the overall class discussions, and complete all required activities during each class.
* 9-1 points are awarded for students who arrive late, do not stay on topic, and come to class unprepared to engage in class discussions.
* 0 points were awarded for absence from class.
* Students are allowed **no more than two (2) absences**. Absences in excess of this will lower the final grade by one full letter grade.
* All students should attend the class on time. Two late days represent one absence.

Please Note: **The instructor has the right to award any point value between 1-10 following the above guidelines.**

#### Excused Absence

* An excused absence must be pre-approved by the instructor.
* Medical absences will only be awarded when the student provides a Drs. note based on appropriate situations.
* Only documented emergencies or unavoidable events will be excused.

#### Course Assignments and Grading

| Assignment Weights | Percent |
| --- | --- |
| Class participation | 10% |
| Quizzes | 20% |
| Hands-on projects | 30% |
| Midterm Exam | 20% |
| Final Exam | 20% |
| Total | 100% |

#### Grading System

100-93: A 92.9-90: A- 89.9-87: B+ 86.9-83: B 82.9-80: B-

79.9-77: C+ 76.9-73: C 72.9-70: C- 69.9-60: D Below 60: F

#### Students With Special Needs

Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Students Support Services (OSSS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student’s eligibility from OSSS, which is located in Room A-P508. It is the student’s responsibility to initiate contact with the OSSS staff and to follow the established procedures to send the accommodation notice to the instructor.

#### Course Schedule

|  |  |
| --- | --- |
| Week | Topics & Readings |
| 1 | Introduction and Overview: Review of NYC Manufacturing Systems Syllabus, STEL |
| 2 | Material and Manufacturing Structure of Materials |
| 3 | Properties of Materials |
| 4 | Obtaining Raw Materials |
| 5 | Primary Processing 1: Woods |
| 6 | Primary Processing 2: Plastics |
| 7 | Primary Processing 3: Metals |
| 8 | **Midterm exam** |
| 9 | Secondary processing: Casting and molding |
| 10 | Secondary processing: separating and conditioning |
| 11 | Designing Material processing systems |
| 12 | Product design and development |
| 13 | Equipment set up and maintenance |
| 14 | Lab safety and operations |
| 15 | **Final exam** |

Academic Integrity Pledge

I understand the value of personal integrity and ethical behavior in all aspects of my professional and personal life. By committing to honesty and personal responsibility, I earn respect and trust of others. As a student at New York City College of Technology, I recognize that the value of my education is not just being able to say I am a college graduate but also incorporating the skills, deals, and knowledge I have acquired. I thus commit myself to upholding academic integrity as an important aspect of my personal integrity. I understand that academic integrity includes:

1. Fully observing the rules governing exams and assignments regarding resource material, electronic aids, copying, collaborating with others, or engaging in any other behavior that subverts the purpose of the exam or assignment, and the directions of the instructor.
2. Only turning in work that I have done myself, and not using unattributed work done by others. While working and studying with others can be an effective way to learn, submitted work will be my own.
3. Giving full and proper credit to sources and references, and acknowledging the contributions and ideas of others, in my academic work.

*I have read and understand the Academic Integrity Policy found in the New York City College of Technology College Catalog*

Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Course, section \_EDU 2441, D001\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Modified from the Marquette University Honor Code, PB, RB; AM; 12/23/20

## EDU 2441 Learning Outcomes and Assessment Methods

EDU 2441 Material Processing and Conversion

Career and Technology Teacher Education (CTTE)

|  |  |
| --- | --- |
| 1. Demonstrate a comprehensive understanding of the historical evolution of material conversion and processing techniques. | Evaluation of individual student knowledge from quizzes and exams. |
| 2. Identify appropriate materials essential for effective engineering design, considering their properties and characteristics. | Analysis of individual student in design challenges related to material selections |
| 3. Apply acquired knowledge and techniques to transform raw materials into secondary components. | Evaluation of student performance in design challenge. |
| 4. Analyze and showcase a diverse array of material processing and conversion methods, highlighting their respective advantages and limitations. | Analysis of student performance in classroom discussions, group assignments and individual oral presentations. |
| 5. Evaluate the products resulting from material processing, while assessing their broader implications and environmental impacts. | Analysis of student performance in Classroom Discussion, Group Activities, Group Presentations, Quizzes, Midterm, Final Exam. |
| 6. Set up and operate a range of material processing tools, including the jointer, surface planer, table saw, power miter saw, bandsaw, sander, and drill press, with utmost attention to safety. | Analysis of student performance and written report related to lab management. |
| 7. Apply problem-solving and analytical skills to engineering design problems for laboratory activities. | Analysis of student performance and written report for the final project |
| 8. Communicate concepts and techniques for the secure utilization of material processing equipment, ensuring comprehensive understanding among learners. | Evaluation of student performance in group project. |
| 9. Display an in-depth understanding of the secure operation of machinery, tools, and materials, promoting a culture of safety within engineering environments. | Analysis of student performance in Classroom Discussion, Group Activities, Group Presentations, Quizzes, Midterm, Final Exam. |

# Appendix D. EDU 2461 Communication Technology and Information Systems

## EDU 2461 New Course Proposal Form

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

This form is used for all new course proposals. Attach this to the [Curriculum Modification Proposal Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-10-Curriculum_Modification_Proposal_Form.docx) and submit as one package as per instructions. Use one New Course Proposal Form for each new course.

|  |  |
| --- | --- |
| **Course Title** | Communication Technology and Information Systems |
| **Proposal Date** | 1/23/2024 |
| **Proposer’s Name** | Euisuk Sung |
| **Course Number** | EDU 2461 |
| **Course Credits, Hours** | 2 cl hrs, 3 lab hrs, 3 cr |
| **Course Pre / Co-Requisites** | EDU 1400 |
| **Catalog Course Description** | Development of foundational understandings of information and communication. Explore the components of data, information, and knowledge and their effective transmission modes. The topics include computers and related devices, graphic media, electronic communication, and entertainment technologies. Students develop an understanding of up-to-date communication technologies, including computer networks, the Internet, cybersecurity, the impacts of communication, and artificial intelligence. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | Information and communication is one of the most rapidly changing areas; therefore it is necessary to revise the contents according to the latest trends, and a discrepancy between its contact hours (6 hours) and contents has been reported. While EDU 2460 has focused on technical aspects such as CAD, photo, audio, and video that overlap with EDU 1400, STEL, the new technology education standards, prioritize communication and information, focusing on data literacy, the Internet, the latest communication means, and computers. |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | None |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | N/A |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | N/A |
|  |
|  |
| **Intent to Submit as a Writing Intensive Course** | No |

**NEW COURSE PROPOSAL CHECK LIST**

Use this checklist to ensure that all required documentation has been included. You may wish to use this checklist as a table of contents within the new course proposal.

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | Y |
| * Brief Rationale | Y |
| * CUNY – Course Equivalencies | Y |
| Completed [Library Resources and Information Literacy Form](https://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form-rev3F16.doc) |  |
| **Course Outline**  Include within the outline the following. |  |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | Y |
| Prerequisites/Co- requisites | Y |
| Detailed Course Description | Y |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | Y |
| Example Weekly Course outline | Y |
| Grade Policy and Procedure | Y |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | Y |
| Library resources and bibliography | Y |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. |  |
| Target Students who will take this course. Which programs or departments, and how many anticipated?  Documentation of student views (if applicable, e.g. non-required elective). |  |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. |  |
| If additional physical resources are required (new space, modifications, equipment), description of these requirements. If applicable, Memo or email from the VP for Finance and Administration with written comments regarding additional and/or new facilities, renovations or construction. |  |
| Where does this course overlap with other courses, both within and outside of the department? |  |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? |  |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. |  |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | Y |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | Y |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | Y |
| How does this course support Programmatic Learning Outcomes? | Y |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | N |
| **Additional Forms for Specific Course Categories** |  |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) |  |
| Interdisciplinary Committee Recommendation (if applicable and if received)\*  \*Recommendation must be received before consideration by full Curriculum Committee |  |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) |  |
| Writing Intensive Form if course is intended to be a WIC (under development) |  |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. |  |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** |  |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). |  |
| Established Timeline for Curricular Experiment |  |

## EDU 2461 Course Syllabus

**New York City College of Technology**

**Department of Career and Technology Teacher Education**

Course Number: **EDU-2461** Title: Communication Technology and Information Systems

Credit Hours: 3 (2cl, 3 lab hrs) Class Meeting Times:

Instructor: Classroom:

Email: Office:

Office Phone: Office Hours:

**COURSE DESCRIPTION**

Development of foundational understandings of information and communication. Explore the components of data, information, and knowledge and their effective transmission modes. The topics include computers and related devices, graphic media, electronic communication, and entertainment technologies. Students develop an understanding of up-to-date communication technologies, including computer networks, the Internet, cybersecurity, the impacts of communication, and artificial intelligence.

Prerequisite: EDU 1400.

**PURPOSE OF THE COURSE**

The course is designed to help students develop an understanding of how communication systems work; of the importance of communication to the societies of the world; and of the interrelationship between communications technology and other technological systems. Teacher education students will be exposed to information and experiences that will further develop their technical skills and assist them in promoting technological awareness in their own students.

**COURSE OBJECTIVES**

Upon completion of the course, students should be able to:

1. Discuss the evolution of communication technologies and their influence on society and the environment.
2. Exhibit a working knowledge of the proper use of communication tools, techniques, and resources.
3. Provide creative solutions to design challenges relating to communication systems.
4. Discuss, plan, and use instructional techniques associated with methods of problem solving, decision-making, and experimentation in the communications technology classroom.
5. Integrate other academic disciplines with the study of communication technology.
6. Describe the implementation of communication technology systems into business, industrial, and educational settings.
7. Describe the interrelationship between communication technology systems and other technological areas such as transportation, manufacturing, construction and bio-related technologies.
8. Identify various career opportunities that are associated with communication technology.
9. Develop activities for use with students in communication technology courses at either the elementary, middle, or secondary level.

**REQUIRED TEXT AND MATERIALS**

1. Charles Petzold (2023). Code: The hidden language of computer hardware and software (2nd eds). Pearson Education, Inc. ISBN: 978-0-13-790910-0
2. New York State Education Department. *Communication Systems Curriculum Guide*. Available: <http://www.nysed.gov/common/nysed/files/programs/career-technical-education/technology-education-communication-systems-grades-9-12-systems-course.pdf>
3. Arduino, Project Starter Kit (e.g., [ELEGOO UNO Project Super Starter Kit with Tutorial and UNO R3 Compatible with Arduino IDE](https://www.amazon.com/ELEGOO-Project-Tutorial-Controller-Projects/dp/B01D8KOZF4/ref=sr_1_2_sspa?keywords=arduino+starter+kit&qid=1674917212&sprefix=arduino%2Caps%2C82&sr=8-2-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEzNE5LQzNIVFFWT1FKJmVuY3J5cHRlZElkPUEwMzY2MDQ2M0UyQUgxNkhPSUZFVSZlbmNyeXB0ZWRBZElkPUEwOTE1MDY2MzhLWVhQOVdMOVNVQiZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=))

**ATTENDANCE/PARTICIPANTION**

* You can attend in-person on campus or attend class virtually in real-time through Zoom.
* You will earn 0-10 points per class within the following guidelines. This policy begins in the first class.
* 10 points are awarded for students who are on time, stay on task, contribute to the overall class discussions, and complete all required activities during each class.
* 9-1 points are awarded for students who arrive late, do not stay on topic, and come to class unprepared to engage in class discussions.
* 0 points were awarded for absence from class.
* Students are allowed **no more than two (2) absences**. Absences in excess of this will lower the final grade by one full letter grade.
* All students should attend the class on time. Two late days represent one absence.

Please Note: **The instructor has the right to award any point value between 1-10 following the above guidelines.**

**EXCUSED ABSENCE**

* An excused absence must be pre-approved by the instructor
* Medical absences will only be awarded when the student provides a Drs. note based on appropriate situations.
* Only documented emergencies or unavoidable events will be excused.

**EVALUATION**

10% Active participation in the class/class discussions

40% Mini Projects

30% Midterm examination

20% Term Project

Grading System

100-93: A 92.9-90: A- 89.9-87: B+ 86.9-83: B 82.9-80: B-

79.9-77: C+ 76.9-73: C 72.9-70: C- 69.9-60: D Below 60: F

**SAFETY**

1. All safety procedures and rules outlined apply to this class's members.

2. Approved eye protection devices must be worn when using any power equipment in the laboratory, if applicable.

3. Students should wear eye protection gear while working on hands-on tasks.

4. **No food or drink should be brought into the fabrication lab**.

5. After a lab activity, all students are responsible for cleaning the lab.

6. If you are not confident using a particular machine or tool, you should immediately stop using it and report to the instructor.

**STUDENTS WITH SPECIAL NEEDS**

Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Students Support Services (OSSS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student’s eligibility from OSSS, which is located in Room A-P508. It is the student’s responsibility to initiate contact with the OSSS staff and to follow the established procedures to send the accommodation notice to the instructor.**Weekly schedule**

|  |  |  |
| --- | --- | --- |
| Week | Topics | Reading & Assignments  Activities |
| 1 | Syllabus Review  Communication System Curriculum Review  Def of Communication | ITEEA (2000), Standards for Technological Literacy  NYSED (1996). Communication Systems  Patil (2013). Communication Yesterday, Today, and Tomorrow |
| 2 | Communication & Information Systems | Hacker & Burghardt (1990, pp 262-276).  Project I -Telegraph Project (1/2) Exploring solutions |
| 3 | Computer Systems and Hardware | Telegraph Project (2/2) – Designing & Making |
| 4 | Computer Software  Intro to Python Programming | Programming with Scratch |
| 5 | The Internet | Project II – Smart Home (1/3) Exploring solutions |
| 6 | Communicating using microcontroller | Project II – Smart Home (2/3) Circuit design |
| 7 | Computer Networking | Project II – Smart Home (3/3) Building smart home |
| 8 | **Midterm Exam** | |
| 9 | Graphic Communication | Digital Printing |
| 10 | Digital multimedia communication | Project III – Video production (1/2) |
| 11 | Video Editing | Project III – Video production (2/2) |
| 12 | Concept of Artificial Intelligence |  |
| 13 | Application of Artificial Intelligence |  |
| 14 | The Impacts of Artificial Intelligence |  |
| 15 | **Final Project Presentation** | |

**Project 1 – Telegraph**

Samuel Morse (1791-1872) was born in Charlestown, Massachusetts, and studied at Yale University before moving to England to become a painter. However, he was not very successful artistically and later moved to the United States and painted in Washington, DC. While he was working in Washington, DC, his wife suddenly passed away, but she heard the news late, so she was unable to attend her funeral. After this incident, Morse gave up art and became an inventor, making the Morse telegraph. In this project, let's understand the principle of the Morse telegraph and make a model to send a message to a friend far away. This project will be done individually.

Materials: Wood panel (18” x 12”), nail, wire, a battery, metal strips, **enameled copper wire**

Reference: A Simple Telegraph from Instructables (<https://www.instructables.com/A-simple-telegraph/>), Homemade Telegraph (https://www.instructables.com/homade-telegraph/)

**Project 2 - Smart Home**

More than 1 million people over 65 live in New York City, half of whom live alone. Roughly a quarter of New York City's residents are senior citizens, and nearly 60% live in poverty and receive federal aid. Recently, with the development of smart home technology, a device with a built-in computer has been installed in the house to make life easier, but many elderly people who have not learned to use computing technologies do not enjoy the benefits. In addition, in the case of elderly people living alone need an emergency contact device or security alarm system to get help when an emergency occurs. The project aims to develop an affordable smart home system for your local community seniors for their safety and convenience. Two students will work together as a team.

Required materials: Arduino Uno, HC-05 Bluetooth module, wires, cardboard (will be provided)

Requirements:

* Build a model house using form boards
* Use Arduino UNO, sensor kit, and Bluetooth module
* Include at least three smart home functions.
* Design and build a circuit for the smart home system.

**Project 3 - Video Production**

Produce a video that promotes the CTTE department's technology education program. The total length of the video must be less than 3 minutes, and images and music that do not violate copyright must be used. You will need to submit storyboards and finished videos. Three students will work together as a team. Use your smartphone for recording.

**Final Project - Smart Thing with AI & Voice Recognition**

With the generalization of artificial intelligence, technologies using voice recognition and AI are increasing in everyday life. In this open-ended final project, you will need to develop a smart device. The device must be automatically controlled through voice recognition or camera recognition. Three students will work together as a team.

Required materials: Voice recognition modules (e.g., elechouse - $28) or camera module for motion detection

Academic Integrity Pledge

I understand the value of personal integrity and ethical behavior in all aspects of my professional and personal life. By committing to honesty and personal responsibility, I earn respect and trust of others. As a student at New York City College of Technology, I recognize that the value of my education is not just being able to say I am a college graduate but also incorporating the skills, deals, and knowledge I have acquired. I thus commit myself to upholding academic integrity as an important aspect of my personal integrity. I understand that academic integrity includes:

1. Fully observing the rules governing exams and assignments regarding resource material, electronic aids, copying, collaborating with others, or engaging in any other behavior that subverts the purpose of the exam or assignment, and the directions of the instructor.
2. Only turning in work that I have done myself, and not using unattributed work done by others. While working and studying with others can be an effective way to learn, submitted work will be my own.
3. Giving full and proper credit to sources and references, and acknowledging the contributions and ideas of others, in my academic work.

*I have read and understand the Academic Integrity Policy found in the New York City College of Technology College Catalog*

Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Course, section \_EDU2461 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Modified from the Marquette University Honor Code, PB, RB; AM; 12/23/20

## EDU 2461 Learning Outcomes and Assessment Methods

EDU 2461 Information and Communication

Career and Technology Teacher Education (CTTE)

|  |  |
| --- | --- |
| LEARNING OUTCOMES | ASSESSMENT METHODS |
| 1. Discuss the evolution of communication technologies and their influence on society and the environment. | Evaluation of individual student knowledge from quizzes and exams. |
| 2. Exhibit a working knowledge of the proper use of communication tools, techniques, and resources. | Analysis of student performance in design challenges related to communication projects |
| 3. Provide creative solutions to design challenges relating to communication systems. | Evaluation of student performance in design challenge. |
| 4. Discuss, plan, and use instructional techniques associated with methods of problem solving, decision-making, and experimentation in the communications technology classroom. | Analysis of student performance in classroom discussions, group assignments and individual oral presentations. |
| 5. Integrate other academic disciplines with the study of communication technology. | Analysis of student performance in Classroom Discussion, Group Activities, Group Presentations, Quizzes, Midterm, Final Exam. |
| 6. Describe the implementation of communication technology systems into business, industrial, and educational settings. | Analysis of student performance and written report related to lesson plan developments |
| 7. Describe the interrelationship between communication technology systems and other technological areas such as transportation, manufacturing, construction and bio-related technologies. | Analysis of student performance and written report for the final project |
| 8. Identify various career opportunities that are associated with communication technology. | Analysis of student performance in classroom discussion, group activities, and presentation. |
| 9. Develop activities for use with students in communication technology courses at either the elementary, middle, or secondary level. | Analysis of student performance and written report related to lesson plan developments |

# Appendix F. EDU 3430 Computer System Application

## EDU 3430 New Course Proposal Form

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

This form is used for all new course proposals. Attach this to the [Curriculum Modification Proposal Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-10-Curriculum_Modification_Proposal_Form.docx) and submit as one package as per instructions. Use one New Course Proposal Form for each new course.

|  |  |
| --- | --- |
| **Course Title** | Computer System Applications |
| **Proposal Date** | 01/23/2024 |
| **Proposer’s Name** | Euisuk Sung |
| **Course Number** | EDU 3430 |
| **Course Credits, Hours** | 2 cl hrs, 3 lab hrs, 3 cr |
| **Course Pre / Co-Requisites** | EDU 2430 or EDU 2461 |
| **Catalog Course Description** | Develop problem-solving skills utilizing computer systems. Students develop a fundamental understanding of computer systems for teaching computer technology with an emphasis on secondary education. Topics include computer hardware, operating systems, memory structures, peripheral devices, software, and the impact of computing. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | Historically, the Jackson's Mill Curriculum Project (Snyder & Hales, 1980) and Standards for Technological Literacy (ITEEA, 2000) emphasized the systems approach in technology education. EDU 3400 was structured accordingly to introduce the general concept of systems. However, as problem-solving, engineering design, and computer integration have risen to prominence in K-12 technology education curricula, we propose EDU 3430 to teach foundational knowledge of computer, data literacy, and computer applications. |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | None |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | N/A |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | N/A |
|  |
|  |
| **Intent to Submit as a Writing Intensive Course** | No |

**NEW COURSE PROPOSAL CHECK LIST**

Use this checklist to ensure that all required documentation has been included. You may wish to use this checklist as a table of contents within the new course proposal.

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | Y |
| * Brief Rationale | Y |
| * CUNY – Course Equivalencies | Y |
| Completed [Library Resources and Information Literacy Form](https://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form-rev3F16.doc) |  |
| **Course Outline**  Include within the outline the following. |  |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | Y |
| Prerequisites/Co- requisites | Y |
| Detailed Course Description | Y |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | Y |
| Example Weekly Course outline | Y |
| Grade Policy and Procedure | Y |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | Y |
| Library resources and bibliography | Y |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. |  |
| Target Students who will take this course. Which programs or departments, and how many anticipated?  Documentation of student views (if applicable, e.g. non-required elective). |  |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. |  |
| If additional physical resources are required (new space, modifications, equipment), description of these requirements. If applicable, Memo or email from the VP for Finance and Administration with written comments regarding additional and/or new facilities, renovations or construction. |  |
| Where does this course overlap with other courses, both within and outside of the department? |  |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? |  |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. |  |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | Y |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | Y |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | Y |
| How does this course support Programmatic Learning Outcomes? | Y |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | N |
| **Additional Forms for Specific Course Categories** |  |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) |  |
| Interdisciplinary Committee Recommendation (if applicable and if received)\*  \*Recommendation must be received before consideration by full Curriculum Committee |  |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) |  |
| Writing Intensive Form if course is intended to be a WIC (under development) |  |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. |  |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** |  |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). |  |
| Established Timeline for Curricular Experiment |  |

## EDU 3430 Course Syllabus

**New York City College of Technology**

**Department of Career and Technology Teacher Education**

Course Number: **EDU-3430**  Title: Computer System Applications

Credit Hours: 3 (2cl, 3 lab hrs) Class Meeting Times:

Instructor: Classroom:

Email: Office:

Office Phone: Office Hours:

#### Course Description

Develop problem-solving skills utilizing computer systems. Students develop a fundamental understanding of computer systems for teaching computer technology with an emphasis on secondary education. Topics include computer hardware, operating systems, memory structures, peripheral devices, software, and the impact of computing.

Prerequisite: EDU 2430 or EDU 2461

#### Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Demonstrate a comprehensive understanding of the historical evolution of computer systems and their applications.
2. Apply acquired knowledge of the computing fundamentals and concepts involved in the use of computer systems.
3. Analyze and showcase the structure of computer hardware, software, and operating systems through microcontrollers.
4. Set up and operate a range of computing tools, including basic word processing, graphic editing, software development, and utilities.
5. Display an in-depth understanding of the internet, computer networks, cybersecurity, and troubleshooting within K-12 education laboratory settings.
6. Apply computational thinking and analytical skills to design problems for laboratory activities.
7. Communicate concepts and techniques for the secure utilization of data processing and manipulation, ensuring a comprehensive understanding of computer systems.
8. Identify appropriate instructional materials essential for effective teaching K-12 AP computer science principles.

#### Course Materials

Kevin Hare. (2020). Computer science principles: The foundational concepts of computer science for AP Computer Science. Yellow Dart Publishing (2nd edition). ISBN: 978-1-7345549-2-2

#### Attendance/Participation

* You will earn 0-10 points per class within the following guidelines. This policy begins in the first class.
* 10 points are awarded to students who are on time, stay on task, contribute to the overall class discussions, and complete all required activities during each class.
* 9-1 points are awarded for students who arrive late, do not stay on topic, and come to class unprepared to engage in class discussions.
* 0 points were awarded for absence from class.
* Students are allowed **no more than two (2) absences**. Absences in excess of this will lower the final grade by one full letter grade.
* All students should attend the class on time. Two late days represent one absence.

Please Note: **The instructor has the right to award any point value between 1-10 following the above guidelines.**

#### Excused Absence

* An excused absence must be pre-approved by the instructor.
* Medical absences will only be awarded when the student provides a Drs. note based on appropriate situations.
* Only documented emergencies or unavoidable events will be excused.

#### Course Assignments and Grading

| Assignment Weights | Percent |
| --- | --- |
| Class participation | 10% |
| Quizzes | 20% |
| Hands-on projects | 30% |
| Midterm Exam | 20% |
| Final Exam | 20% |
| Total | 100% |

#### Grading System

100-93: A 92.9-90: A- 89.9-87: B+ 86.9-83: B 82.9-80: B-

79.9-77: C+ 76.9-73: C 72.9-70: C- 69.9-60: D Below 60: F

#### Students With Special Needs

Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Students Support Services (OSSS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student’s eligibility from OSSS, which is located in Room A-P508. It is the student’s responsibility to initiate contact with the OSSS staff and to follow the established procedures to send the accommodation notice to the instructor.

#### Course Schedule

|  |  |
| --- | --- |
| Week | Topics & Readings |
| 1 | Introduction to the computer system application: history of computing, evolution, and modern computing |
| 2 | Hardware, software, number systems |
| 3 | Gate and Boolean expressions |
| 4 | Pixels, images, and graphic applications |
| 5 | Compressing data: data and algorithms |
| 6 | Storing data: spreadsheets and databases |
| 7 | Programming fundamentals |
| 8 | **Midterm exam** |
| 9 | The Internet 1: computing systems and networks |
| 10 | The Internet 2 : network system, DNS, IP protocols |
| 11 | Programming: Javascript 1 – data type and conditional operators |
| 12 | Programming: Javascript 2 – forms, functions, and events |
| 13 | Protecting data: heuristics, security, and encryption |
| 14 | Impact of computing |
| 15 | **Final exam** |

Academic Integrity Pledge

I understand the value of personal integrity and ethical behavior in all aspects of my professional and personal life. By committing to honesty and personal responsibility, I earn respect and trust of others. As a student at New York City College of Technology, I recognize that the value of my education is not just being able to say I am a college graduate but also incorporating the skills, deals, and knowledge I have acquired. I thus commit myself to upholding academic integrity as an important aspect of my personal integrity. I understand that academic integrity includes:

1. Fully observing the rules governing exams and assignments regarding resource material, electronic aids, copying, collaborating with others, or engaging in any other behavior that subverts the purpose of the exam or assignment, and the directions of the instructor.
2. Only turning in work that I have done myself, and not using unattributed work done by others. While working and studying with others can be an effective way to learn, submitted work will be my own.
3. Giving full and proper credit to sources and references, and acknowledging the contributions and ideas of others, in my academic work.

*I have read and understand the Academic Integrity Policy found in the New York City College of Technology College Catalog*

Printed Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Course, section \_EDU 3430, D001\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Modified from the Marquette University Honor Code, PB, RB; AM; 12/23/20

## EDU 3430 Learning Outcomes and Assessment Methods

EDU 3430 Computer System Applications

Career and Technology Teacher Education (CTTE)

|  |  |
| --- | --- |
| LEARNING OUTCOMES | ASSESSMENT METHODS |
| 1. Demonstrate a comprehensive understanding of the historical evolution of computer systems and their applications. | Evaluation of individual student knowledge from quizzes and exams. |
| 2. Apply acquired knowledge of the computing fundamentals and concepts involved in the use of computer systems. | Analysis of student performance in design challenges related to computer systems. |
| 3. Analyze and showcase the structure of computer hardware, software, and operating systems through microcontrollers. | Analysis of student performance in Classroom Discussion, Group Activities, Group Presentations, Quizzes, Midterm, Final Exam. |
| 4. Set up and operate a range of computing tools, including basic word processing, graphic editing, software development, and utilities. | Analysis of student performance and written report related to lab management. |
| 5. Display an in-depth understanding of the internet, computer networks, cybersecurity, and troubleshooting within K-12 education laboratory settings. | Analysis of student performance in Classroom Discussion, Group Activities, Group Presentations, Quizzes, Midterm, Final Exam. |
| 6. Apply computational thinking and analytical skills to design problems for laboratory activities. | Analysis of student performance and written report for the final project |
| 7. Communicate concepts and techniques for the secure utilization of data processing and manipulation, ensuring a comprehensive understanding of computer systems. | Analysis of student performance and written report for the final project |
| 8. Identify appropriate instructional materials essential for effective teaching K-12 AP computer science principles. | Analysis of student performance and written report related to lesson plan developments |