14-27 EMT 1240 Introduction to Computer Engineering Technology 4/21/2015

**New York City College of Technology / CUNY**

**Computer Engineering Technology Department**

Curriculum Modification and New course for P-TECH students in the Electromechanical Engineering Technology AAS program

April 20, 2015

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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** | Curriculum Modification and New course for P-TECH students in the Electromechanical Engineering Technology AAS program |
| **Date** | February 17, 2015 |
| **Major or Minor** | Major Proposal |
| **Proposer’s Name** | Yu Wang, Benito Mendoza |
| **Department** | Computer Engineering Technology |
| **Date of Departmental Meeting in which proposal was approved** | February 19, 2015 |
| **Department Chair Name** | Sunghoon Jang |
| **Department Chair Signature and Date** |  |
| **Academic Dean Name** |  |
| **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. | This proposal focus on two elements that would modify the curriculum of the P-TECH program in EMT AAS:   1. The creation of a new course for P-TECH, and 2. A minor change in the P-TECH curriculum |
| **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). | Pathways in Technology Early College High School (P-TECH) is a new type of school that brings together the best elements of high school, college and the professional world. P-TECH graduates have the opportunity to earn an associate degree from CITY TECH on either, Computer System Technology (CST) or Electromechanical Engineering Technology (EMT). They take courses in EMT and CST, as part of their regular curriculum. Then, later, they decide which program to complete. The nature and similarity between these programs (the computing aspects) make that the core courses the students currently take have some content overlapping and prevent them to explore more about both programs.  This proposal’s goal is to eliminate the overlapping and provide a better insight of the EMT program via two elements:   1. The creation of a new course that is more suitable for the P-TECH students and helps students to better understand the EMT program and, in case of select this program, have more chances of success with the rest of the EMT curriculum. 2. A minor change in the P-TECH curriculum, regarding the courses P-TECH students take from the EMT program. |
| **Proposal History** | This is a new proposal with correction. March 30, 2015 |

Please include all appropriate documentation as indicated in the Curriculum Modification Checklist.

For each new course, please also complete the New Course Proposal and submit in this document.

Please submit this document as a single .doc or .rtf format. If some documents are unable to be converted to .doc, then please provide all documents archived into a single .zip file.

**ALL PROPOSAL CHECK LIST**

|  |  |
| --- | --- |
| Completed CURRICULUM MODIFICATION FORM including: |  |
| * Brief description of proposal | Y |
| * Rationale for proposal | Y |
| * Date of department meeting approving the modification | Y |
| * Chair’s Signature | Y |
| * Dean’s Signature | Y |
| 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. | Y |
| Documentation of Advisory Commission views (if applicable). | N/A |
| Completed [Chancellor’s Report Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-09-Chancellor_Report_Quick_Reference_Guide1.doc). | Y |

**EXISTING PROGRAM MODIFICATION PROPOSALS**

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

**Computer Engineering Technology Department**

**Curriculum Modification and New course for P-TECH students in the Electromechanical Engineering Technology AAS program**

## Proposal Rationale

Pathways in Technology Early College High School (P-TECH) is a program developed in collaboration between the NYC Department of Education, CITY TECH, CUNY and IBM to encourage students to earn STEM AAS degrees while still enrolled in NYC public high schools. President Obama discussed P-TECH in his 2013 State of the Union speech, praising the model for the way it prepares students for a 21st century economy, enhancing American competitiveness. Our Electromechanical Engineering Technology Associates degree is one of the two degrees offered by this program, along with the Computer Information Systems AAS program offered by other CITY TECH department, Computer System Technology (CST).

Currently P-TECH students take two courses in each program as part of the core requisites. From EMT they take are *EMT1111: Logic and Problem Solving* and *EMT1250: Fundamentals of Digital Systems*. From CST, the courses *are CST1100: Introduction to Computer Systems* and *CST1101: Problem Solving with Computer Programming*. After completing these courses P-TECH students have to decide what program to complete. Both AAS programs share some similarities in the field of computing (problem solving and computer programming). During these years, since the P-TECH program started, we have identified some overlapping on the content of the first college courses offered by both CST and EMT programs. This overlapping sometimes prevents the students to explore or know more about each program and make a better decision on which program to complete. We have also identified the needs of P-TECH students when they studied EMT1250. It seems to be difficult for the students to understand well the content covered by EMT1250 without the fundamentals of electrical circuits and basic semiconductor devices.

This proposal aims to solve the issues mentioned above. That is, eliminate or minimize the overlapping, and provide P-TECH students to have foundations in the topics related to Circuits, Devices, and Digital Computer Basic. Thus, the EMT program has decided to change the course that covers the fundamentals of the electrical, electronics, and computer hardware field. P-TECH student will not take EMT1111 and EMT1250 courses anymore. Instead, the CET department agreed on offering instead **EMT1240: Introduction to Computer Engineering Technology and its corresponding lab course EMT 1240L** (a new course based on EMT1250 and EMT 1250L, which includes intro to electrical circuits, basic semiconductor devices, and digital electronics) and introduce EMT2370: Computer Hardware Systems (an existing course). This would help the students to decide what program to complete and eliminate content overlapping.

# Section AIII: Changes Applied only on P-TECH Program

**The following revisions are proposed for the AAS in Electromechanical Technology**

**Program:**

**Program Code:**

**Effective Date: Fall 2015**

|  |  |
| --- | --- |
| **FROM:** | **TO:** |
| P-TECH 11 Credits  CST1100 Introduction to Computer Systems 3  CST1101 Problem Solving with Computer Programming 3  ~~EMT1111 Logic and Problem Solving 1~~  ~~EMT1250 Fundamentals of Digital Systems 4~~ | P-TECH 12 Credits  CST1100 Introduction to Computer Systems 3  CST1101 Problem Solving with Computer Programming 3  EMT1240 Introduction to Computer Engineering Technology 4  EMT2370 Computer Hardware Systems 2 |

**Rationale:**

Pathways in Technology Early College High School (P-TECH) is a program developed in collaboration between the NYC Department of Education, CITY TECH, CUNY and IBM to encourage students to earn STEM AAS degrees while still enrolled in NYC public high schools. Students in the P-TECH program take two courses from Computer System Technology (CST) and two from Electromechanical Engineering Technology (EMT) before they decide what program to complete, as shown in the table above column “From”.

The nature and similarity between these two programs (the computing aspects) make that the core courses the students currently take have some content overlapping and prevent them to explore more about both programs. This proposal’s goal is to eliminate the overlapping and provide a better insight of the EMT program via two elements:

1. The creation of a new course (EMT1240) that is more suitable for the P-TECH students and helps students to better understand the EMT program and, in case of select this program, have more chances of success with the rest of the EMT curriculum.
2. A minor change in the P-TECH curriculum, regarding the courses P-TECH students take from the EMT program.

The department agreed on removing EMT1111 andEMT1250 and instead offering EMT1240 (a new course based on EMT1250) and offering EMT2370 (an existing EMT course) as part of the P-TECH program. The new course EMT1240 will be only available for P-TECH students. P-TECH students have a different preparation than our regular students. The course EMT1250 is not replaced only by the new course EMT1240, but for the group of courses mentioned above, including CST courses. The P-TECH students’ background allows us to make the course EMT1240 more inclusive; we cover more topics including the majority of the content from EMT1250 (given that parts of EMT1250, such as logical operations, have been included in CST courses) and the necessary background for understanding electrical circuits.

Overall, the group of courses mentioned above are sufficient to satisfy the requirements of our curriculum regarding the objectives of EMT1111 and EMT1250. The courses of CST1100 (3 cr.), CST1101 (3 cr.), and EMT 1240 (4 cr.), a total of 10 credits, make up for the topics covered in two of our original courses EMT1111 (1 Cr.) and EMT1250 (4 cr.), a total 5 credits.

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 Computer Engineering Technology |
| **Proposal Date** | February 17 , 2015 |
| **Proposer’s Name** | Yu Wang, Benito Mendoza |
| **Course Number** | EMT 1240 |
| **Course Credits, Hours** | 4 Credits, 3 Class hours, 3 Lab Hours. |
| **Course Pre / Co-Requisites** | Pre-requisite: CST 1100 |
| **Catalog Course Description** | Introduction to basic electrical theory, semiconductor devices, digital electronics, and applications. Topics cover key fundamentals of electrical quantities, digital logic, and digital computer basics. Hands-on laboratory experience reinforces the students learning and provides opportunity to transfer theory learned in lecture to practical applications. Open only to students at Pathways to Technology Early College High School (P-TECH). |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | This course is designed to meet the needs of P-TECH students for the fundamentals of electrical and electronics. It provides a foundation in the topics related to DC Circuits, Semiconductor Devices, and Digital Electronics to the students in P-TECH program, and prepare P-TECH students to successfully continue on to AAS associate degree in Electromechanical Engineering Technology (EMT) or Computer Information Systems (CST). |
| **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 |
| **Intent to Submit as An Interdisciplinary Course** | N/A |
| **Intent to Submit as a Writing Intensive Course** | N/A |

Please include all appropriate documentation as indicated in the NEW COURSE PROPOSAL Combine all information into a single document that is included in the Curriculum Modification Form.

**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 |
| Completed [Library Resources and Information Literacy Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form.doc) | Y |
| **Course Outline**  Include within the outline the following. | Y |
| 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. | Y |
| 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). | Y |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. | Y |
| 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. | N |
| Where does this course overlap with other courses, both within and outside of the department? | N/A |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? | Y |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. | N/A |
| **Course Design**  Describe how this course is designed. | Y |
| 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** | N/A |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) | N/A |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) | N/A |
| Writing Intensive Form if course is intended to be a WIC (under development) | N/A |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. | N/A |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** | N/A |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). | N/A |
| Established Timeline for Curricular Experiment | Y |

## Chancellor’s Report Template for New or Experimental Courses

**Section AIV: New Courses**

**AIV.1 Department: Computer Engineering Technology**

|  |  |
| --- | --- |
| **CUNYfirst Course ID** |  |
| **Department(s)** | **Computer Engineering Department** |
| **Career** | **[ x ] Undergraduate  [ ] Graduate** |
| **Academic Level** | **[x ] Regular  [   ] Compensatory  [   ] Developmental  [   ] Remedial** |
| **Subject Area** | **Electrical and Electronics** |
| **Course Prefix** | **EMT** |
| **Course Number** | **1240** |
| **Course Title** | **Introduction to Computer Engineering Technology** |
| **Catalogue Description** | **Introduction to basic electrical theory, semiconductor devices, digital electronics, and applications. Topics cover key fundamentals of electrical quantities, digital logic, and digital computer basics. Hands-on laboratory experience reinforces the students learning and provides opportunity to transfer theory learned in lecture to practical applications. Open only to students at Pathways to Technology Early College High School (P-TECH).** |
| **Pre/ Co Requisites** | **Pre: CST1100** |
| **Credits** | **4** |
| **Contact Hours** | **3 Class Hours, 3 Lab Hours** |
| **Liberal Arts** | **[ ] Yes  [  x ] No** |
| **Course Attribute (e.g. Writing Intensive, Honors, etc.)** | **None** |
| **Course Applicability** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **[X] Major** |  |  |  | | | **[ ] Gen Ed Required** | | **[ ] Gen Ed - Flexible** | | **[ ] Gen Ed - College Option** | | **[ ] English Composition** | | **[ ] World Cultures** | | **College Option Detail\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | **[ ] Mathematics** | | **[ ] US Experience in its Diversity** | |  | | **[ ] Science** | | **[ ] Creative Expression** | |  | |  |  | **[ ] Individual and Society** | |  | |  |  | **[ ] Scientific World** | |  | |
| **Effective Term** | **Fall 2015** |

Rationale:  This course is designed to meet the needs of P-TECH students for the fundamentals of electrical and electronics. It provides a foundation in the topics related to DC Circuits, Semiconductor Devices, and Digital Electronics to the students in P-TECH program, and prepare P-TECH students to successfully continue on to AAS associate degree in Electromechanical Engineering Technology (EMT) or Computer Information Systems (CST).

# LIBRARY RESOURCES & INFORMATION LITERACY: MAJOR CURRICULUM MODIFICATION

Please complete for **all** major curriculum modifications. This information will assist the library in planning for new acquisitions; it will not affect curriculum proposals either positively or negatively.

Consult with library faculty subject selectors (<http://cityte.ch/dir>) **3 weeks in advance** when planning course proposals to ensure enough time to allocate budgets if materials need to be purchased.

**Course proposer:** please complete boxes 1-4. **Library faculty subject selector:** please complete box 5.

|  |  |  |
| --- | --- | --- |
| **1** | **Title of proposal**  Curriculum Modification and New course for P-TECH students in the Electromechanical Engineering Technology AAS program | **Department/Program**  Computer Engineering Technology (CET) / AAS in Electromechanical Engineering Technology (EMT) |
|  | **Proposed by** (include email & phone)  Prof. B. Mendoza | [bmendoza@citytech.cuny.edu](mailto:bmendoza@citytech.cuny.edu)  718-260-5885  Prof. Yu Wang |[ywang@citytech.cuny.edu](mailto:ywang@citytech.cuny.edu)  718.260.5893 | **Expected date course(s) will be offered**  2015 Fall  **# of students** 44 |

|  |  |
| --- | --- |
| **2** | **Are City Tech library resources sufficient for course assignments? Please elaborate.**  A search of the CITY TECH library catalog with the keywords “electrical circuits”, “Electronics”, “Logic gates”, and “Floyd, Thomas L” shows sufficient print and electronic resources are available, that can be used as reference material for this course. Existing material used in courses EMT1150 and EMT1250 can be used for the proposed course too. |

|  |  |
| --- | --- |
| **3** | **Are additional resources needed for course assignments? Please provide details about format of resources (e.g., eBooks, journals, DVDs, etc.), author, title, publisher, edition, date, and price.**  No additional resources are needed for course assignments since sufficient number of books and journals on this subject are available in the library. |

|  |  |
| --- | --- |
| **4** | **Library faculty focuses on strengthening students' information literacy skills in finding, evaluating, and ethically using information. We can collaborate on developing assignments and offer customized information literacy instruction and research guides for your course.**  **Do you plan to consult with the library faculty subject specialist for your area? Please elaborate.**  Once the course is offered, the department faculty teaching the course may consult with the library faculty subject specialist to determine the future needs of textbook change or update, and acquisition of additional journals and online resources. |

|  |  |
| --- | --- |
| **5** | **Library Faculty Subject Specialist** \_\_\_\_\_Junior Tidal\_\_\_\_\_ jtidal@citytech.cuny.edu \_\_\_\_\_\_\_\_\_  **Comments and Recommendations**  After surveying the library’s collection, I believe that the material available is adequate for supporting this course.  **Date: 2.10.15** |

Computer Engineering Technology Department

Electromechanical Engineering Technology Program

# Course Outline (EMT1240)

|  |  |  |  |
| --- | --- | --- | --- |
| **Prepared by** | Yu Wang, Benito Mendoza | **Revision date** |  |
| **Course No. & Title** | EMT 1240 – Introduction to Computer Engineering Technology | | |
| **Course Description** | Introduction to basic electrical theory, semiconductor devices, digital electronics, and applications. Topics cover key fundamentals of electrical quantities, digital logic, and digital computer basics. Hands-on laboratory experience reinforces the students learning and provides opportunity to transfer theory learned in lecture to practical applications. Open only to students at Pathways to Technology Early College High School (P-TECH). | | |
| **Hours / Credits** | 3 Class hour, 3 Lab Hours, 4 Credits | | |
| **Pre-requisites** | Pre-requisites: CST 1100 | | |
| **Pre / Co-requisites** |  | | |
| **Gen-Ed Objectives** | * Develop discipline-specific knowledge and skills. * Acquire and use tools needed for communication, inquiry, and analysis. * Integrate knowledge and application within and across disciplines. | | |
| **Course Objectives** | 1. Demonstrate basic knowledge how electrical circuits, semiconductor devices, and digital electronic systems fit into the context of professional careers, ethics, societal needs, and environmental concerns. 2. Demonstrate basic knowledge relating to direct current circuits (DC), semiconductor devices and digital electronics. 3. Demonstrate knowledge of the Ohm’s Laws, Kirchhoff's Laws, and techniques to apply in series circuit and parallel circuit. 4. Demonstrate basic knowledge of diode biasing. 5. Understand combinational logic circuits and sequential logic circuits. 6. Apply knowledge of logic gates, Boolean Algebra, K-Map, and DeMorgan's Theorems in digital circuits. 7. Utilize the knowledge of mathematics and science to gain an understanding of the operation of electrical and electronics systems. 8. Reinforce theory and techniques taught in the classroom through experiments in the laboratory. | | |

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| --- | --- | --- |
| **Text book 1** | Electronics Fundamentals: Circuits, Devices & Applications, 8/E | Book cover |
| **Author** | Thomas L. Floyd, David M. Buchla |
| **Publisher** | Prentice Hall @2010 |
| **ISBN** | ISBN-10: 0135072956  ISBN-13: 9780135072950 |

|  |  |  |
| --- | --- | --- |
| **Text book 2** | Digital Fundamentals, 11/E | Book cover |
| **Author** | Thomas L. Floyd |
| **Publisher** | Prentice Hall @2015 |
| **ISBN** | ISBN-10: 0132737965  ISBN-13: 9780132737968 |

|  |  |  |
| --- | --- | --- |
| **Text / Ref. book 1** | Digital Electronics: A Practical Approach with VHDL, 9/e | Book cover |
| **Author** | William Kleitz |
| **Publisher** | Prentice Hall @2012 |
| **ISBN** | ISBN-10: 0132543036  ISBN-13: 9780132543033 |

|  |  |  |
| --- | --- | --- |
| **Text / Ref. book 2** | Introduction to Basic Electricity and Electronics | Introduction to Basi…,9781133948513 |
| **Author** | Gates, Earl D |
| **Publisher** | Cengage Learning @2014 |
| **ISBN** | ISBN-10: 1133948510  ISBN-13: 9781133948513 |

|  |  |  |
| --- | --- | --- |
| **Text / Ref. book 3** | Lab Manual for Gates' Introduction to Basic Electricity and Electronics Technology | Lab Manual for Gates…,9781133948520 |
| **Author** | Gates, Earl D |
| **Publisher** | Cengage Learning @2014 |
| **ISBN** | ISBN10: 1133948529  ISBN13: 9781133948520 |

|  |  |
| --- | --- |
| **Week** | **Lecture Topic (EMT 1240)** |
| 1 | Course outline, classroom conduct, academic integrity, attendance, and grading policy.  A brief history of electricity, digital, and analog devices. Safety. Electrical quantities and units and measurements.  Chapter 1 (Text book 1) |
| 2 | Voltage, current, and resistance. Resistor color codes and standard resistor values. The electrical circuit and switches. Ohm’s law for calculating current, voltage, and resistance in DC circuit. Power in an electric circuit.  Chapters 2 and 3 (Text book 1) |
| 3 | Connecting resistors in series. Current in a series circuit. Voltage sources in series. Kirchhoff’s voltage law. Application of Ohm’s law in series DC circuit.  Chapters 5 (Text book 1)  Exam 1 |
| 4 | Connecting resistors in parallel. Voltage in a Parallel Circuit. Kirchhoff’s Current Law. Application of Ohm’s Law in parallel DC circuit. Open and Short Circuits.  Chapters 6 (Text book 1) |
| 5 | Introduction to semiconductors. The *p-n* junction diodes. Diode characteristics. Special-purpose diodes.  Chapters 16 (Text book 1) |
| 6 | Digital concept. Binary Digits, Logic Level, and Digital Waveform. Overview of Basic Logic Functions and Integrated Circuits  Chapter 1 (Text book 2)  Exam 2 |
| 7 | Number systems and codes: Binary, Hexadecimal, BCD Code, ASCII Code, and Conversion between number systems  Chapter 2 (Text book 2) |
| 8 | Logic gates and circuit: AND, OR, NAND, NOR. Chapter 3 (Text book 2) |
| 9 | Logic gates and circuit: XOR, XNOR, Buffer. Chapter 3 (Text book 2) |
| 10 | Boolean algebra, DeMorgan’s theorem, and reduction techniques (Karnaugh Maps).  Chapter 4 (Text book 2)  Exam 3 |
| 11 | Combinational Logic using the universal properties of NAND and NOR gates. Build binary Comparators.  Chapter 5 (Text book 2) |
| 12 | Functions of Combinational Logic, Adder and Decoder.  Chapter 6 (Text book 2) |
| 13 | Latches, Flip-Flops  Chapter 7 (Text book 2) |
| 14 | Registers and applications  Chapter 7 (Text book 2) |
| 15 | Final Exam |

|  |  |
| --- | --- |
| **Week** | **Hands-on Lab Topic EMT1240L (**Lab manual will be provided by CET department) |
| 1 | Tools and equipment for electrical circuit and electronics. Safety. Resistor color code and resistor measurements. |
| 2 | Ohm’s law experiment. Build a circuit on Breadboard. |
| 3 | Series resistor measurement and parallel resistor measurement. |
| 4 | Voltage and current in a series DC circuit. KVL Law |
| 5 | Current and voltage in a parallel DC circuit. KCL Law. |
| 6 | Semiconductor Diodes. Measure, test, and observe the forward and reverse characteristics |
| 7 | Function generator, Logic Probe, and Oscilloscope. |
| 8 | Digital signal for AND and OR gates. |
| 9 | Digital signal for NAND and NOR gates. |
| 10 | Combinational Logic Circuits and Simplification |
| 11 | Universal capability of NAND and NOR gate |
| 12 | Binary adder |
| 13 | Flip-Flops and registers |
| 14 | Counter |
| 15 | Digital electronics applications |

**COURSE POLICIES:**

**Grading:**

* Three Exams 30 %
* Final Exam 20 %
* Lab Exercises, Lab Reports and Lab Project: 30 %
* Homework Assignments and Quizzes: 15 %
* Attendance, Class and Group Participation: 5 %
* Total: 100 %

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Score % | < 60 | 60-69.9 | 70-76.9 | 77-79.9 | 80-82.9 | 83-86.9 | 87-89.9 | 90-92.9 | 93-100 |
| Grade | F | D | C | C+ | B- | B | B+ | A- | A |

**Blackboard and OpenLab:**

* Blackboard and OpenLab web sites will be used extensively to provide course material, collect assignments and reports and provide detailed grading information. Students must make sure their Blackboard login is working in the beginning of the course.

**Reading and Reference Material:**

* Reading and reference material will be provided in Blackboard and OpenLab– Contents section as needed.

**Software for Lab / Project:**

* Software applications will be used in the labs and course project. The links to download the software will be posted in Blackboard.

**Lab Reports:**

* Lab reports must be submitted INDIVIDUALLY.
* Lab reports must be in PDF file format.
* All lab reports must be submitted through Blackboard – Assignments section.
* Each lab report is due one week after the lab work is performed.
* Any late-due lab report will have 20% late penalty one week after due date.
* Additional requirements on lab report’s content and format will be posted on Blackboard or OpenLab. Please read them carefully.

**Library Usage:**

* Students are encouraged to use the library for supplementary resources in support of the lectures and labs.

**Attendance:**

* Under CityTech Policy, attendance in each class is required.
* At the beginning of each class, the instructor will make a roll call of all the student names to check the attendance.
* Any lateness must be reported to the instructor by the students before the class is dismissed.
* A name without on-time attendance nor reported lateness will be considered as absence.
* 2 lateness will be considered equal to 1 absence.
* Being absent for more than 3 times or being late for more than 6 times in a semester may result in a **WU** or **F** grade during or after the semester.
* Any absence due to emergencies (e.g., emergency medical condition or no-fault legal crisis) needs to be notified to the instructor by email or in-person.
* Excused absences can ONLY be considered with signed explanatory notes from proper party with proper authority.

**Classroom Conduct Policy:**

* Cell phone ringing and any other distracting and disruptive behavior such as talking loudly without permission are absolutely prohibited and may cause the student to be expelled from class.
* Any activity that threatens the college academic integrity will result in a disciplinary action.
* Please refer to the Student Handbook and the Catalog of New York City College of Technology for a full listing of Student Code of Conduct, Classroom Behavior Guidelines and Academic Integrity Rules.

**Academic Integrity Policy:**

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion.

# Course Design and Assessment

**Course Design**

As stated in the detailed rationale in the beginning of this proposal, this is one of the core courses offered by EMT AAS program to the P-TECH students. The course is structured as a combination of lecture sessions and hands-on lab sessions. The hands-on sessions include lab exercises, experiments and individual and/or group projects. The course will provide adequate preparation to the students in P-TECH and to have a better understanding of the EMT the AAS program. This course will help them to decide whether to continue in the EMT program or to go into the CST program. The course will also prepare them in order to do well in the corresponding courses at the CET Bachelor’s level.

This course directly supports one of the program educational objectives of the EMT AAS program which states that graduates of the EMT program who desire to continue their education will be able to pursue a Bachelor's degree in a related undergraduate program.

**Course Need Assessment**

The course will be offered to the P-TECH students in the P-TECH facilities. It is expected that up to two sections of 22 students each will be able to take this course when offered in both Spring and Fall semesters.

No additional physical resources are required since students will take this course in lieu of an existing course in the EMT program, EMT1250. This course will serve as a preparatory course towards some of the courses in the EMT AAS and CET BTech program where similar topics are covered at a more advanced level. Existing faculty in the CET department is qualified and available to teach this course. Adequate equipment and lab resources are also available for the hands-on component of the course.

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| **General Education Learning Outcomes** | **Assessment Methods** |
| Demonstrate acquisition of discipline specific knowledge. | Students will at minimum, demonstrate knowledge of basic technical terms relating to electrical circuits, safety, digital systems such as may be found in a job interview in the computer technology field or in the electrical/electronic technology field. Students who excel will be able to use logic and reasoning to find answers to new questions. This will be assessed by quizzes, homework, regular exams, and final exams. |
| Demonstrate effective oral and written communication skills.  Gather, interpret, evaluate and integrate information from a variety of sources. | Students will verbally discuss and explain basic concepts of electrical and electronics systems. Students will demonstrate their abilities to write reports showing the results of experiments in the lab and complement them with information obtained from different sources. This would be assessed by lab reports |
| Demonstrate the ability to apply theoretical knowledge to solve problems within and across disciplines. | Students will work to design, build, and analyze solutions to problems related to electrical and electronics systems. The problems would cover to different types of applications and disciplines. This would be assessed with lab reports. |

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| **Course Specific Learning Outcomes** | **Assessment Methods** |
| 1. Demonstrate basic knowledge of how electrical circuits, semiconductor devices, and digital electronic systems fit into the context of professional careers, ethics, societal needs, and environmental concerns. | Assess student performance based on multiple choice and essay questions on the quizzes, regular exams, and final exams, and homework problems. |
| 1. Demonstrate basic knowledge relating to direct current circuits (DC), semiconductor devices and digital electronics. | Assess student performance based on multiple choice and essay questions on the quizzes, exams, and final exams, and homework problems. |
| 1. Demonstrate knowledge of the Ohm’s Laws, Kirchhoff's Laws, and techniques to apply in series circuit and parallel circuit. | Assess student performance based on multiple choice and essay questions on the quizzes, exams, and final exams, and homework problems.  Assess student performance based on hand-on lab exercises and preparation of lab reports. |
| 1. Demonstrate basic knowledge of diode biasing | Assess student performance based on multiple choice and essay questions on the quizzes, exams, and final exams, and homework problems.  Assess student performance based on hand-on lab exercises and preparation of lab reports. |
| 1. Understand combinational logic circuits and sequential logic circuits. | Assess student performance based on problem solving on the quizzes, exams, and final exams, and homework problems.  Assess student performance based on hand-on lab exercises and preparation of lab reports, as well as lab project demonstrations. |
| 1. Apply knowledge of logic gates, Boolean algebra, K-Map, and DeMorgan's theorem in digital circuits. | Assess student performance based on hand-on lab exercises and preparation of lab reports, as well as lab project demonstrations. |
| 1. Utilize the knowledge of mathematics and science to gain an understanding of the operation of electrical and electronics systems. | Assess student performance based on multiple choice and essay questions on the quizzes, exams, and final exams, and homework problems.  Assess student performance based on hand-on lab exercises and preparation of lab reports. |
| 1. Reinforce theory and techniques taught in the classroom through experiments in the laboratory. | Assess student performance based on hand-on lab exercises and preparation of lab reports, as well as lab project |

# Department Approval

**2015-02-19Departmental Meeting Minutes**

Present: Sunghoon Jang, Robert Armstrong, Seymour Blank, Aparicio Carranza, Ohbong Kwon, Xiaohai Li, Benito Mendoza, Edward Morton, John Razukas, José Reyes Álamo, Yu Wang, Farrukh Zia, James Leung

Started at 12:40 PM

1. Approval of the minutes of the previous departmental meeting.
   1. Tasks Assignments: Prof. Morton - President of the National Society of Black Engineers (NSBE)
2. Chair’s statement and report of the current developments in the department and college.
   1. Chair has not received enrollment report yet.
   2. College are selecting CityTech as their primary choice more often. Students needing remedial courses decreasing.
   3. We have the TV in front of the Department. Send any material to Dr. Li. Plans to present news and info.
3. CET faculty’s peer observation and office hours for Spring 2015
   1. Latest schedules sheet passed. Please notify of any changes.
   2. Schedule of peer observations is ready.
4. MCF/Planning of Summer & Fall 2015
   1. MCF stands for Master Course Files
   2. Last Summer we planned to offer EMT 1150 and EMT 1250, but only EMT 1250 was taught. Discussion about whether to offer EMT 1150 again or some other course. We may be offering EMT 1150 again.
5. Updated progress report of CET track program in EMT by Prof. Zia
   1. For the C++ for embedded systems, a few meetings remain to get the course approved.
   2. Most concerns from other departments addressed.
6. New course proposal for EMT 1240 by Profs. Wang & Mendoza.
   1. Problems with the current offering to P-TECH students. We offer less credits and non-sequential courses.
   2. Courses like CST 1100 and CST 1101 already teach them programming. With EMT 1240 students will be able to see the difference between CST and CET.
   3. The second course from our program for P-TECH will be EMT 2370.
   4. Discussion about the credits that will be counted in CST vs. CET. This course will cover EMT 1250, and the CST 1100 will cover EMT 1111. Currently we are working on how to credit students for taking CST 1101.
   5. Different topics to add/remove from the syllabus of EMT 1240 were suggested. Some topics may need more time.
   6. CET is trying to match CST credits. Currently students get a total of 11 credits if they choose CST, 6 credits if they choose CET.
7. About Departmental Advisement (ABET concern). A guideline was prepared by Prof. Mendoza and will be posted on the CET website. This way students will be informed and faculty prepared and we can address the ABET concern about some students not knowing who their adviser was. Discussion of plans to conduct a survey to find out how many students are aware of who their adviser is and how to better communicate to students this information.
8. New faculty search protocols with Ms. Patricia Cody
   1. Title IX training email will be sent later today to all faculty. This covers discrimination on the basis of sex: sexual harassment, sexual assault, sexual discrimination, etc.
   2. Security issues or dangerous situations you may contact Public Safety or 911. Oher issues contact Ms. Cody
   3. Because of affirmative action and anti-discrimination laws, persons asking the questions must be aware of the areas that are protected.
   4. About affirmative action, the federal government provides geographical data and jobs categories with their expectations (e.g. in x number of years, y number of women should be hired). If these numbers are not met that is known as underutilization. Fulfilling this number is also affected by the fact that this is a specialized field and by the pool of applicants we receive.
   5. Jobs notices should be posted. The appointments committee, the applicant’s pool expected to be diverse. Always the most qualified applicant is the one that should be hired.
   6. CUNY Central has new employment applications. Before questions about convictions and potential accommodation or medical issues were shared only with the Chairs. The new application is separated into three parts: the first part with general applicant info and can be shared with other faculty, the second one deals with the sensitive info, and a third part.
   7. About anti-discrimination laws, Ms. Cody’s background has experience. Certain things we should just move on and not have a conversation about (e.g. a candidate say she is pregnant, a candidate says he is gay).
   8. About unemployment, NYC has a new law and you cannot ask about unemployment or gaps in employment. You may ask: how do you do to keep your skills current?
   9. If a candidate is currently employed, you may ask: what interested you about this position?
   10. Consistency is very important. You may ask the same questions to every applicant. Perhaps have a set of questions already prepared (scripted).
   11. Do not write on a person’s resume. Best practice is to take notes and later on to destroy them.
9. Minor EMT program modification for GenEd Electives by Profs. Wang and Kwon.
   1. Changes proposed were passed to faculty.
   2. Changes were approved unanimously.

Meeting Adjourned at 2:28 PM

# Support From the CST Department

>>> Yu Wang 02/27/15 10:50 PM >>>  
Dear Prof. Li,  
Thank you very much for your comments for EMT1240L, the need of P-TECH program. We will re-structure this lab component as a new course with 0 credit. The title and description will be the same as EMT1240.  
Thank you again for support.

Yu Wang, Ph.D

CET Program Coordinator

Computer Engineering Technology Department V629

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>>> Hong Li 02/27/15 4:57 PM >>>

Hi Prof. Wang and Prof. Jang,

Thank you for sharing the draft proposal of EMT1240P and sorry that I had to leave yesterday in hurry.

The CST department supports the proposal of new course EMT1240P/EMT1240PL to address need of P-TECH program of our two departments.

I hope this email serves the evidence of consultation with other departments.

I have only one note about the organization of document: You may need to structure the document including the EMT1240PL as new course with 0 credit, title, description. Make sure include EMT1240PL in Chancellor report as new course as well.

Please let me know if you need more information in support of this proposal.

Best regards,

Hong Li, PH.D.  
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