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** | New Course Proposal: “Media Computation” (MTEC 2230) |
| **Date** | November 18, 2014 |
| **Major or Minor** | Major |
| **Proposer’s Name** | Adam Wilson |
| **Department** | Entertainment Technology |
| **Date of Departmental Meeting in which proposal was approved** | November 18, 2014 |
| **Department Chair Name** | Charles Scott |
| **Department Chair Signature and Date** | 11/18/2014 |
| **Academic Dean Name** | Kevin Hom |
| **Academic Dean Signature and Date** | 12/23/2014 |
| **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 Entertainment Technology Department proposes to add a new course, “Media Computation” (MTEC 2230), to its Emerging Media Technologies program 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). | There are three tracks, or concentrations, in the Emerging Media Technologies program: “Media Design,” “Tangible Media,” and “Media Computation.” Each concentration, except for Media Computation, has a gateway course that serves as a foundation for skills required in upper-level courses within the concentration. The proposed course provides the missing foundation for the Media Computation track. |
| **Proposal History**  (Please provide history of this proposal: is this a resubmission? An updated version? This may most easily be expressed as a list). | This document represents the first attempt to submit this new course proposal. However, the need for a Media Computation course in the Creative Media Foundations requirement for the BTech in Emerging Media was originally outlined in Curriculum Modification Proposal 13-02, which passed College Council on 11/12/2013. See http://www.300jaystreet.com/college-council/resources/2010/04/13\_02-ENT\_Major\_Modification-2013-11-11-v4.pdf and http://www.300jaystreet.com/college-council/resources/2013/10/CCCC-minutes-11-12-13.pdf. Also, see **F. EMERGING MEDIA CURRICULUM FLOWCHART,** taken from 13-02, included with this document. |

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 | ✔ |
| * Rationale for proposal | ✔ |
| * Date of department meeting approving the modification | ✔ |
| * Chair’s Signature | ✔ |
| * Dean’s Signature | ✔ |
| 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. | ✔ |
| 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). | ✔ |

**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) | ✔ |

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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** | Media Computation |
| **Proposal Date** | November 18, 2014 |
| **Proposer’s Name** | Adam Wilson |
| **Course Number** | MTEC 2230 |
| **Course Credits, Hours** | 3.00 credits, 4.0 hours: 2.0 class hours and 2.0 lab hours |
| **Course Pre / Co-Requisites** | **Pre-requisites:**  “Media Computation Skills Lab” (MTEC 1003),  “Emerging Media Foundation” (IMT 1101)  **Co-requisites:**  None |
| **Catalog Course Description** | Introduces a selection of programming languages, software tools, algorithms, and data analysis techniques for engaging with new media as a software developer. Students are exposed to a diverse set of specific technologies, potentially including but not limited to: JavaScript, Bash, mySQL, C, Matlab/Octave, Rails, Max/PureData, and Amazon Web Services. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | There are three tracks, or concentrations, in the Emerging Media Technologies program: “Media Design,” “Tangible Media,” and “Media Computation.” Each concentration, except for Media Computation, has a gateway course that serves as a foundation for skills required in upper-level courses within the concentration. The proposed course provides the missing foundation for the Media Computation track. |
| **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. | The proposed course is not intended to fulfill Common Core requirements. |
| **Intent to Submit as An Interdisciplinary Course** | The proposed course is not intended as an interdisciplinary course. |
| **Intent to Submit as a Writing Intensive Course** | The proposed course is not intended as a writing intensive course. However, excellent reading comprehension is necessary for success in the course; the requirement for CUNY proficiency in reading and writing is implicitly required through course prerequisites. |

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 | ✔ |
| * Brief Rationale | ✔ |
| Completed [Library Resources and Information Literacy Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form.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 | ✔ |
| Pre-requisites/Co-requisites | ✔ |
| Detailed Course Description | ✔ |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | ✔ |
| Example Weekly Course outline | ✔ |
| Grade Policy and Procedure | ✔ |
| Recommended Instructional Materials (Textbooks, lab supplies, etc.) | ✔ |
| Library resources and bibliography | ✔ |
| **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. | N/A |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | ✔ |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | ✔ |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | ✔ |
| How does this course support Programmatic Learning Outcomes? | ✔ |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | ✔ |
| **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) | 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)**)** |  |
| 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 | N/A |

# EVIDENCE OF CONSULTATION WITH AFFECTED DEPARTMENTS

The proposed course affects only the Entertainment Technology Department, and is only required of students taking the Bachelor of Technology in Emerging Media Technologies. Future upper-level courses planned for the Media Computation concentration in Emerging Media Technologies may (presuming this proposal is approved) require MTEC 2230 as a prerequisite

The course is not a *formal* prerequisite for any course outside of the Entertainment Technology Department, but will likely better prepare our students for more in-depth courses from the CST department that we require or recommend as electives in the Media Computation concentration (see **OVERLAP WITH OTHER COURSES and the email thread included with this document indicating approval from the CST department’s curriculum committee**).

# DETAILED RATIONALE

There are three tracks, or concentrations, in the Emerging Media Technologies program: “Media Design,” “Tangible Media,” and “Media Computation.” Students in Emerging Media Technologies are required to take a specific foundational course in each of the three areas prior to choosing a concentration. Each concentration, except for Media Computation, has a gateway course that serves as a foundation for skills required in upper-level courses within the concentration: for the Media Design concentration, “Interaction Design I” (MTEC 2120) serves as the gateway course; for the Tangible Media concentration, “Tangible Media” (MTEC 2250) is the gateway course. The need for a Media Computation course was originally outlined in Curriculum Modification Proposal 13-02, which passed College Council on 11/12/2013. See <http://www.300jaystreet.com/college-council/resources/2010/04/13_02-ENT_Major_Modification-2013-11-11-v4.pdf> and <http://www.300jaystreet.com/college-council/resources/2013/10/CCCC-minutes-11-12-13.pdf> (also, see **F. EMERGING MEDIA CURRICULUM FLOWCHART,** taken from 13-02, included with this document).

Until we have comprehensive foundation course for Media Computation in place, we are forced to substitute courses that offer only a subset of the content that would be covered in a more comprehensive overview. For example, we have used “Ins and Outs of Physical Computing” (MTEC 2280) as a stand-in gateway course for the Media Computation area. However, this course covers hardware programming only, whereas a comprehensive introduction to Computational Media should additionally cover a selection of important programming languages, an introduction to modern tools for full-stack web development, and algorithms and data analysis techniques applicable to common problems in new media programming.

# COURSE OUTLINE

## HOURS AND CREDITS

3.00 credits, 4.0 hours: 2.0 class hours and 2.0 lab hours

## PRE- / CO-REQUISITES

Pre-requisites

* “Media Computation Skills Lab” (MTEC 1003)
* “Problem Solving with Computer Programming” (CST 1101)
* “Emerging Media Foundation” (IMT 1101)

Co-requisites

* None

## DETAILED COURSE DESCRIPTION

*Media Computation* introduces a selection of programming languages, software tools, algorithms, and data analysis techniques for engaging with new media as a software developer. Students gain experience with web development, real-time data analysis, data visualization/sonification, and hardware and user-interface programming by using each new set of related concepts and tools to incrementally develop components of a pre-specified application. Students are exposed to a diverse set of specific technologies, potentially including but not limited to: JavaScript, Bash, mySQL, C, Matlab/Octave, Rails, Max/PureData, and Amazon Web Services.

## COURSE-SPECIFIC LEARNING OUTCOMES AND ASSESSMENT TABLES

**Learning Outcomes and Assessment**

|  |  |
| --- | --- |
| **For the successful completion of this course, a student should be able to:** | **Evaluation methods and criteria:** |
| Demonstrate comprehension of programming vocabulary, such as “functional,” “object-oriented,” “stack,” “shell,” “process,” etc. | Each lab assignment will be given verbally and in written form as a “word problem ”using vocabulary from lectures. Students will demonstrate comprehension by successfully completing each lab. |
| Effectively organize a large software project. | All lab assignments and code commentary will be submitted over Github via git, which will require students to adhere to a strict protocol for versioning and communication. Students will be motivated to learn in order to receive credit for their work; properly submitted assignments will indicate success. |
| Quickly synthesize and apply new APIs, software tools, languages and libraries in concert to realize a complex, multi-faceted end product. | This is baked into the course: the final project, which students will work toward through their lab assignments and outside efforts, will require quickly acquiring facility in several languages and tools. A (mostly) functioning final project at the end of the semester will indicate success in this area. |

**General Education Learning Outcomes and Assessment**

|  |  |
| --- | --- |
| **For the successful completion of this course, a student should be able to:** | **Evaluation methods and criteria:** |
| Integrate knowledge and skills within a knowledge domain. | The final project will integrate several disparate technologies; students who are able to get these separate pieces interoperating by the end of the semester will have demonstrated success in this area. |
| Reason quantitatively and mathematically as required in the field of interest and in everyday life | During lab hours, students may struggle with quantitative problems that may require a bit more cogitation outside of class; even just conceptually grasping the Fourier Transform and being able to graph the results from a 3rd-party FFT library can be daunting after one lecture on the subject. Such labs overflow into homework assignments; those who submit largely correct work in these cases will demonstrate that they have spent the extra time to think these problems through independently. |
| Work collaboratively in diverse groups directed at accomplishing learning objectives | For more complex lab assignments, students will be encouraged to work in “pair programming” teams. Functional lab assignment submissions completed within the time limits of the lab meeting indicate success. |

## EXAMPLE WEEKLY COURSE OUTLINE

## Week 1: Introduce an over-arching project through which students will learn various languages, tools, and techniques. An example project:

## Retrieve seismic data using a web service provided by the Incorporated Research Institutions for Seismology (IRIS), and, in real-time, analyze it in the frequency domain and use the analysis to synthesize a sound in the audible spectrum.

## Use features of interest extracted through spectral analysis to control an LED light sculpture in real-time.

## Store analysis results in a database so that the “performance” can be recreated.

## Build a web application to demonstrate our sonification/visualization to casual users of the Internet; move the analysis database to a server, and build a visualization/audition tool that allows us to view any “performance” in a web browser.

## Get students set up with Github accounts and wired in to the class Github repository with private SSH keys on USB drives; all lab assignments will be uploaded to Github for comments and revision.

Week 2: Lecture on basics of HTTP, REST APIs, Bash shell scripting, and cURL; in lab, students write a Bash script invoking cURL to retrieve and store seismic WAV data from IRIS.

Week 3: Lecture on FFT, GNU Octave. In lab, students use the fft() function from the signal package in GNU Octave to graph the power spectrum of a seismic signal.

Week 4: Lecture on basics of Max/MSP, how to launch shell scripts from Max and how to synthesize audio; in lab, students write a simple program to perform additive synthesis.

Week 5: Lecture on basics of C programming and how to write an external in C for Max/MSP; in lab, students write and compile a “hello world” external in C using XCode.

Week 6: Introduce the fftw library and show efficient methods for peak picking; in lab, students complete a small part of a barely unfinished external that outputs peaks from an fftw analysis; students compile their externals and wire the outputs to their additive synthesizers.

Week 7: Lecture on hardware programming for a specific chipset; provide pre-wired hardware assemblies with LED lights and USB interfaces; in lab, students program the chipset to turn an LED on and off in response to messages sent from Max/MSP over USB.

Week 8: Lecture on mySQL; in lab, students write a Bash script to dump their analysis data to a local database.

Week 9: Introduce Ruby in lecture; in lab, students re-write their Bash scripts in Ruby to get a sense of the new language.

Week 10: Introduce the Rails web framework in lecture; provide virtual machines with Rails development environments pre-installed; in lab, students acquaint themselves with Rails by coding a model for the database table storing their seismic analysis data.

Week 11: Lecture on basics of JavaScript; show how JavaScript is incorporated into a Rails project; in lab, students write a small JavaScript test program to run in their Rails development environment.

Week 12: Lecture on jQuery and D3 and the relationship between JavaScript and these two libraries; in lab, students flesh out a mostly-written data visualization program in D3 that is driven by their seismic data.

Week 13: Lecture on SoundManager 2.0 and provide a refresher on additive synthesis; in lab, students complete a nearly finished JavaScript program to play back their sonifications of seismic data in an appropriate browser.

Week 14: Putting it all together: lecture on Amazon Web Services (EC2 and RDS); student groups are assigned deployment and testing tasks for a single canonical version of the final project.

Week 15: Other students, faculty, and interested parties are invited to class. Students demonstrate the real-time and web-based versions of their project and answer questions.

## GRADE POLICY AND PROCEDURE

Email

Students are required to use official City Tech email for correspondence and account sign-ups. Messages from private email addresses will be ignored.

Attendance

Attendance is expected at every class meeting. College policy sets the maximum number of permissible absences at 10% of the number of class meetings scheduled for the semester. If the class is meeting two times per week, you are permitted to be absent a total of three class sessions; if the class meets only once per week, you are permitted to miss one and one-half of the class meetings.

Academic Integrity

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. The complete text of the College policy on Academic Integrity may be found in the catalog.

Grading/Deadlines

Students must complete all lab and online assignments. Students must also participate in the demonstration of the final project during the last week of class. **All students must sign up for a Github repository and bring a USB drive to class** – without these items, you will be unable to submit work. Lecture and lab classes alternate, and the coding assignment for each lab are due in your Github repository 24 hours prior to the following lecture. **There are 3 conditions that warrant a failing grade for an assignment (note that avoiding these conditions does not necessarily guarantee a passing grade):**

1. **There is a syntax error that prevents your code from being run “out of the box.”**
2. **Any code in an assignment has been plagiarized (this does not include identical work from pairs of programmers who have been allowed to work together).**
3. **The assignment is not received before the deadline, or you have not set up a Github account before the deadline.**

Note that there are 15 assignments (14 lab assignments and a public demonstration of the final project). Lab assignments will receive comments on Github. These will be visible to all members of the class. Based on suggestions for improvement, lab assignments may be resubmitted for a revised grade up to one week after the initial due date. The revised grade will be averaged with the initial grade. Each of the 15 assignments is worth 6.6 points; one extra point will be awarded for perfect attendance.

## 

## RECOMMENDED INSTRUCTIONAL MATERIALS

* <http://git-scm.com/documentation>
* <http://linuxcommand.org/index.php>
* <http://curl.haxx.se>
* <http://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm>
* <http://www.dspguide.com/pdfbook.htm>
* <https://www.gnu.org/software/octave/>
* <http://www.acm.uiuc.edu/webmonkeys/book/c%5Fguide/>
* <https://developer.apple.com/xcode/>
* <http://www.fftw.org>

## <https://cycling74.com/docs/max6/dynamic/c74_docs.html>

* <http://dev.mysql.com/doc/refman/5.6/en/>
* <http://ruby-doc.org/core-1.9.3/>
* <http://guides.rubyonrails.org/v3.2.19/>
* <http://eloquentjavascript.net>
* <http://api.jquery.com>
* <http://d3js.org>
* <http://www.schillmania.com/projects/soundmanager2/>
* <http://aws.amazon.com/documentation/>

## LIBRARY RESOURCES AND BIBLIOGRAPHY

No library resources will be required to supplement the instructional materials listed above.

# COURSE NEED ASSESSMENT

## TARGET STUDENTS

This course targets students pursuing the BTech in Emerging Media Technologies. The course will be required for all students in the Emerging Media Technologies program, and will serve as a foundation course for students wishing to take upper-level MTEC courses associated with the concentration in Media Computation.

## PROJECTED HEADCOUNTS

Course capacity will be capped at 16, and we expect to offer the course once a year until enrollment levels necessitate an offering every semester. All students declaring an MTEC major on or after the catalog year in which this course is introduced will be required to take the course as part of the Creative Media Foundations degree requirement, ideally in the second year of the program. Currently, a typical incoming cohort size for MTEC is 15-30 students per semester.

## PHYSICAL RESOURCES

One computer lab accommodating 16 students will be sufficient to run course. The Entertainment Technology Department already maintains a suitable lab in Voorhees, room 321, in which most of the software required to run the course has already been installed; the few required additions are open-source.

Along with the physical computing resources in the lab, a number of cloud services are needed, and have already been acquired by the department: Amazon Web Services EC2 and RDS will be used for deploying web applications, and Github will be used for code versioning, organization, and commentary.

## OVERLAP WITH OTHER COURSES

The proposed course is intended as a *survey introduction* to a set of programming languages, tools and techniques for use in computation for new media; students will learn just enough to add small missing pieces to a template project. Given the scope and variety of technologies introduced, the depth with which each can be explored is necessarily limited, making it imperative that our students take advantage of the multiple advanced courses from the CST department allowed as Media Computation Concentration electives. These courses cover surveyed topics in much greater detail, and include (but are not limited to):

* CST 1204 Database System Fundamentals
* CST 3201 Multimedia and Mobile Device Programming
* CST 2309 Web Programming I
* CST 2409 Web Programming II
* CST 2403 Introductory C++ Programming Language Part I
* CST 3503 C++ Programming Language Part II

## QUALIFIED FULL-TIME FACULTY IN DEPARTMENT

Entertainment Technology has one full-time faculty member devoted to the Media Computation area in the Emerging Media Technologies program who will teach the proposed course for the foreseeable future.

## DOCUMENTATION SHOWING THE COURSE IS REQUIRED BY AN ACCREDITING BODY

Not applicable.

# 

# COURSE DESIGN

## COURSE CONTEXT

## All students declaring an MTEC major on or after the catalog year in which this course is introduced will be required to take the course as part of the Creative Media Foundations set of courses, as described in the document linked to below:

## <http://www.300jaystreet.com/college-council/resources/2010/04/13_02-ENT_Major_Modification-2013-11-11-v4.pdf>

## COURSE STRUCTURE

## This course will be a combination overview and practicum, and will be divided equally into two hours of class and two hours of lab. Class time will be used to present tools and concepts, and lab will provide time for students to attempt to implement, with guidance from the instructor, pieces of a larger system or application.

## PEDAGOGICAL STRATEGIES

The first meeting each week will take the form of a lecture, during which the instructor will introduce new tools and concepts. The second meeting will take the form of a lab, in which students will receive a mostly completed piece of a pre-designed system and will be asked to complete it using what they learned earlier in the week. The pre-designed system will connect all modules of the course such that, at the close of the semester, students will have realized a single over-arching objective. This objective could take many forms, as long as it incorporates all of the learning modules. One example could be a new media art work, suitable for museum installation, that transforms remote data into sound and light in real-time.

Since we want all of the students to be exposed to all of the material, we cannot split the students into groups to work on separate components of the project, as we do often in ENT 3320, “Technical Production.” However, although all students will be assigned the same task in each lab, when tasks become especially difficult, students will be allowed to organize into pairs to help one another. “Pair programming” is a strategy for rapid development in which two people take on the task of solving a coding problem; one types and the other reviews the code. The instructor will also be available during this time to assist when roadblocks are encountered. Students will be assigned incomplete lab tasks for homework. All lab assignments must be committed to Github in order to receive commentary from the instructor. Students will be offered a chance to revise their initial assignments outside of class/lab time based on instructor commentary.

## SUPPORT OF PROGRAMMATIC LEARNING OUTCOMES

This course supports a number of the Emerging Media learning outcomes, by providing experience in the following areas:

* cloud computing
* web frameworks
* object oriented programming
* physical computing
* data visualization/sonification
* client-side scripting

## ONLINE COMPONENT

While this course will not initially be offered as a hybrid class, there will be a significant online component. Some of the students’ work will be deployed on the cloud (via AWS), and students will push all code for weekly assignments to Github for commentary and revision. Using these tools will help prepare students for work in the software industry, where Github and AWS are ubiquitous.

# 

# 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:**  New Course Proposal: “Media Computation” (MTEC 2230) | **Department/Program:**  Entertainment Technology |
|  | **Proposed by** (include email & phone):  Adam Wilson  [awilson@citytech.cuny.edu](mailto:awilson@citytech.cuny.edu)  718-260-5898 | **Expected date course(s) will be offered:**  Spring 2016  **Number of students:**  16 |

|  |  |
| --- | --- |
| **2** | **Are City Tech library resources sufficient for course assignments? Please elaborate.**  No new library resources are needed. The course is largely an overview/practicum introducing a collection of very specific software development and analysis tools and techniques. All required resources, including in-class instructional materials, open-source and commercial software tools, and publically available online reference materials, will be provided or referenced by the instructor and/or department. |

|  |  |
| --- | --- |
| **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 library resources are needed for course assignments (see section 2). |

|  |  |
| --- | --- |
| **4** | **Library faculty focus 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.**  There is no need for a consultation with library faculty (see section 2). |

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| --- | --- |
| **5** | **Library Faculty Subject Selector:** Bronwen Densmore**,** [bdensmore@citytech.cuny.edu](mailto:bdensmore@citytech.cuny.edu)  **Comments and Recommendations:**    **Date:** 11/18/2014 |

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# CHANCELLOR’S REPORT FORM

**Section AIV: New Course**

**New course to be offered in the Entertainment Technology department**

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| **Department(s)** | Entertainment Technology Department |
| **Academic Level** | **[ X ] Regular  [   ] Compensatory  [   ] Developmental  [   ] Remedial** |
| **Subject Area** | Emerging Media Technologies |
| **Course Prefix** | MTEC |
| **Course Number** | 2230 |
| **Course Title** | Media Computation |
| **Catalog Description** | Introduces a selection of programming languages, software tools, algorithms, and data analysis techniques for engaging with new media as a software developer. Students are exposed to a diverse set of specific technologies, potentially including but not limited to: JavaScript, Bash, mySQL, C, Matlab/Octave, Rails, Max/PureData, and Amazon Web Services. |
| **Prerequisite** | MTEC 1003, CST 1101, IMT 1101 |
| **Corequisite** | N/A |
| **Pre- or corequisite** | N/A |
| **Credits** | 3 |
| **Contact Hours** | 2 Class Hours, 2 Lab Hours |
| **Liberal Arts** | **[ ] Yes  [ X ] No** |
| **Course Attribute (e.g. Writing Intensive, etc.)** | N/A |
| **Course Applicability** | |  |  |  | | --- | --- | --- | | **[X] Major** |  | | | **[ ] Gen Ed Required** | **[ ] Gen Ed - Flexible** | **[ ] Gen Ed - College Option** | | **[ ] English Composition** | **[ ] World Cultures** | **[ ] Speech** | | **[ ] Mathematics** | **[ ] US Experience in its Diversity** | **[ ] Interdisciplinary** | | **[ ] Science** | **[ ] Creative Expression** | **[ ] Advanced Liberal Arts** | |  | **[ ] Individual and Society** |  | |  | **[ ] Scientific World** |  | |
| **Effective Term** | Spring 2016 |

**Rationale**: This course provides a comprehensive foundation for upper-level courses in the Media Computation concentration for the BTech in Emerging Media Technologies.

**Section AIII: Changes in Degree Program**

**The following revisions are proposed for the BTech in Emerging Media Technologies**

**Program**: BTech Degree in Emerging Media Technologies

**Program Code:**  33748

**Effective Date:** Spring 2016, pending the passage of Entertainment Technology Department’s new course proposal titled “Media Computation” (MTEC 2230); see **Section AIV above.**

Note: details shown below support changes in the number of courses required for the degree, the number of credits required for concentration electives, and the number of elective courses to be chosen from a specified list in the Tangible Media concentration.

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| **FROM:** | **TO:** |
| **GENERAL EDUCATION COMMON CORE 42-481**  ………………..  **Subtotal ~~42-46~~**  ………………..  **PROGRAM SPECIFIC DEGREE REQUIREMENTS CREDITS**  **These courses are required for all three concentrations**  ENT 1100 Introduction to Entertainment Technology 3  ENT 1103 Basic Electricity for Live Entertainment 1  ENT 1203 Operating Systems Fundamentals 1  IMT 1101 Emerging Media Foundation 3  IMT 1102 Production Practices 3  MTEC 1001 Media Design Skills Lab 1  MTEC 1003 Web Programming I 1  MTEC 1005 Tangible Media Skills Lab 1  MTEC 2120 Interaction Design I 3  MTEC 2250 Tangible Media 3  MTEC 2280 Ins and Outs of Physical Computing 3  CST 1101 Problem Solving with Computer Programming 3  CST 1201 Programming Fundamentals 3  **~~Subtotal~~****~~29~~**  ………………..  **THESE COURSES ARE REQUIRED FOR ALL**  **THREE CONCENTRATIONS**  **PROGRAM SPECIFIC DEGREE REQUIREMENTS:**  **CREATIVE MEDIA FOUNDATIONS (~~13 COURSES, 29 CREDITS)~~**  ENT 1100 Introduction to Entertainment Technology 3  ENT 1103 Basic Electricity for Live Entertainment 1  ENT 1203 Operating Systems Fundamentals 1  IMT 1101 Emerging Media Foundation 3  IMT 1102 Production Practices 3  MTEC 1001 Media Design Skills Lab 1  MTEC 1003 Web Programming I 1  MTEC 1005 Tangible Media Skills Lab 1  MTEC 2120 Interaction Design I 3  MTEC 2250 Tangible Media 3  MTEC 2280 Ins and Outs of Physical Computing 3  CST 1101 Problem Solving with Computer Programming 3  CST 1201 Programming Fundamentals 3  ………………..   1. **MEDIA DESIGN CONCENTRATION**   **REQUIRED COURSES 13-15**  Select five (5) courses from the following list:  COMD 3540 2-Dimensional Animation 2  COMD 3640 3-Dimensional Animation and Modeling I 3  COMD 4720 Multimedia Design I 3  ARCH 3550 Building Performance Workshop 3  ARCH 3551 Sustainability: History and Practice 3  ENT 1190/  COMD 2320 Introduction to Film and Video Production Design 3  ENT 1250 Lighting Technology 3  ENT 1270 Sound Technology 3  ENT 3390 Sound for Multimedia 3  IND 2313 Industrial Design I 3  MTEC 2210 Media Design 3  MTEC 3125 Nonlinear Narrative 3  MTEC 3160 Performance Design 3  MTEC 3175 Ecological Design 3  MTEC 3230 Introduction to Interactive 3  3D Environments Programming 3  MTEC 3240 Interactive Sound for Games and Simulations 3  **Other Degree-Specific Elective Courses ~~12-14~~**  Select sufficient additional credits from the recommended electives  list equal to ~~27~~ credits in the concentration.   1. **TANGIBLE MEDIA CONCENTRATION**   **REQUIRED COURSES ~~12-21~~**  Select ~~five (5)~~ courses from the following list:  IND 1112 Engineering Drawing I 2  MECH 1222 Computer-Aided Engineering Graphics 2  MECH 1233 Statics and Strength of Materials 3  IND 2304 Advanced Solids Modeling 2  ETN 1102 Principles of Electricity and Electronics 4  ETN 1302 Principles of Electricity, Electronics and  Computer Operation 4  EMT 1150 Electrical Circuits 5  EMT 1250 Fundamentals of Digital Systems 4  ENT 2280 Entertainment Control Systems 3  ENT 4480 Show Control 3  MAT 2580 Introduction to Linear Algebra 3  CST 2403 Introductory C++ Programming Language Part I 3  CET 3510 Microcomputer Systems Technology 4  CET 3640 Software for Computer Control 3  CET 4952 Robotics Technology 4  **Other Degree-Specific Elective Courses ~~6-15~~**  Select sufficient additional credits from the recommended electives  list equal to ~~27~~ credits in the concentration. ~~These credits must include the additional 6 credits of Liberal Arts courses required by the increased math and science requirements for this concentration~~.   1. **~~MEDIA COMPUTING~~ CONCENTRATION**   **REQUIRED COURSES 15-16**  Select five (5) courses from the following list:  CST 1204 Database System Fundamentals 3  CST 1215 Operating System Fundamentals 3  CST 2301 Multimedia and Mobile Device Programming 3  CST 2309 Web Programming I 3  CST 2403 Introductory C++ Programming Language Part I 3  MTEC 3125 Nonlinear Narrative 3  MTEC 3230 Introduction to Interactive 3D Environments Programming 3  MTEC 3240 Interactive Sound for Games and Simulation 3  MAT 1475 Calculus I 4  MECH 3550 Simulation and Visualization 3  COMD 3508 Introduction to Game Design Concepts 3  **Other Degree-Specific Elective Courses ~~11-12~~**  Select sufficient additional credits from the recommended electives  list equal to ~~27~~ credits in the concentration. ~~These credits must include the additional 6 credits of Liberal Arts courses required by the increased math and science requirements for this concentration~~.  ………………..  **COMMON CORE AND COLLEGE OPTION 42**  **PROGRAM-SPECIFIC DEGREE REQUIREMENTS ~~41~~**  **CONCENTRATION ~~37~~**  **REQUIRED FOR THE DREGREE 120** | **GENERAL EDUCATION COMMON CORE 42-481**  ………………..  **Subtotal 42-48**  ………………..  **PROGRAM SPECIFIC DEGREE REQUIREMENTS CREDITS**  **These courses are required for all three concentrations**  ENT 1100 Introduction to Entertainment Technology 3  ENT 1103 Basic Electricity for Live Entertainment 1  ENT 1203 Operating Systems Fundamentals 1  IMT 1101 Emerging Media Foundation 3  IMT 1102 Production Practices 3  MTEC 1001 Media Design Skills Lab 1  MTEC 1003 Web Programming I 1  MTEC 1005 Tangible Media Skills Lab 1  MTEC 2120 Interaction Design I 3  MTEC 2230 Media Computation 3  MTEC 2250 Tangible Media 3  MTEC 2280 Ins and Outs of Physical Computing 3  CST 1101 Problem Solving with Computer Programming 3  CST 1201 Programming Fundamentals 3  **Subtotal** **32**  ………………..  **THESE COURSES ARE REQUIRED FOR ALL**  **THREE CONCENTRATIONS**  **PROGRAM SPECIFIC DEGREE REQUIREMENTS:**  **CREATIVE MEDIA FOUNDATIONS (14 COURSES, 32 CREDITS)**  ENT 1100 Introduction to Entertainment Technology 3  ENT 1103 Basic Electricity for Live Entertainment 1  ENT 1203 Operating Systems Fundamentals 1  IMT 1101 Emerging Media Foundation 3  IMT 1102 Production Practices 3  MTEC 1001 Media Design Skills Lab 1  MTEC 1003 Web Programming I 1  MTEC 1005 Tangible Media Skills Lab 1  MTEC 2120 Interaction Design I 3  MTEC 2230 Media Computation 3  MTEC 2250 Tangible Media 3  MTEC 2280 Ins and Outs of Physical Computing 3  CST 1101 Problem Solving with Computer Programming 3  CST 1201 Programming Fundamentals 3  ………………..   1. **MEDIA DESIGN CONCENTRATION**   **REQUIRED COURSES 13-15**  Select five (5) courses from the following list:  COMD 3540 2-Dimensional Animation 2  COMD 3640 3-Dimensional Animation and Modeling I 3  COMD 4720 Multimedia Design I 3  ARCH 3550 Building Performance Workshop 3  ARCH 3551 Sustainability: History and Practice 3  ENT 1190/  COMD 2320 Introduction to Film and Video Production Design 3  ENT 1250 Lighting Technology 3  ENT 1270 Sound Technology 3  ENT 3390 Sound for Multimedia 3  IND 2313 Industrial Design I 3  MTEC 2210 Media Design 3  MTEC 3125 Nonlinear Narrative 3  MTEC 3160 Performance Design 3  MTEC 3175 Ecological Design 3  MTEC 3230 Introduction to Interactive 3  3D Environments Programming 3  MTEC 3240 Interactive Sound for Games and Simulations 3  **Other Degree-Specific Elective Courses 9-11**  Select sufficient additional credits from the recommended electives  list equal to 24 credits in the concentration.   1. **TANGIBLE MEDIA CONCENTRATION**   **REQUIRED COURSES 9-17**  Select four (4) courses from the following list:  IND 1112 Engineering Drawing I 2  MECH 1222 Computer-Aided Engineering Graphics 2  MECH 1233 Statics and Strength of Materials 3  IND 2304 Advanced Solids Modeling 2  ETN 1102 Principles of Electricity and Electronics 4  ETN 1302 Principles of Electricity, Electronics and  Computer Operation 4  EMT 1150 Electrical Circuits 5  EMT 1250 Fundamentals of Digital Systems 4  ENT 2280 Entertainment Control Systems 3  ENT 4480 Show Control 3  MAT 2580 Introduction to Linear Algebra 3  CST 2403 Introductory C++ Programming Language Part I 3  CET 3510 Microcomputer Systems Technology 4  CET 3640 Software for Computer Control 3  CET 4952 Robotics Technology 4  **Other Degree-Specific Elective Courses 7-15**  Select sufficient additional credits from the recommended electives  list equal to 24 credits in the concentration. These may include up to 6 credits of the General Education Common Core math and science courses required for this concentration.   1. **MEDIA COMPUTATION CONCENTRATION**   **REQUIRED COURSES 15-16**  Select five (5) courses from the following list:  CST 1204 Database System Fundamentals 3  CST 1215 Operating System Fundamentals 3  CST 2301 Multimedia and Mobile Device Programming 3  CST 2309 Web Programming I 3  CST 2403 Introductory C++ Programming Language Part I 3  MTEC 3125 Nonlinear Narrative 3  MTEC 3230 Introduction to Interactive 3D Environments Programming 3  MTEC 3240 Interactive Sound for Games and Simulation 3  MAT 1475 Calculus I 4  MECH 3550 Simulation and Visualization 3  COMD 3508 Introduction to Game Design Concepts 3  **Other Degree-Specific Elective Courses 8-9**  Select sufficient additional credits from the recommended electives  list equal to 24 credits in the concentration. These may include up to 6 credits of the General Education Common Core math and science courses required for this concentration.  ………………..  **COMMON CORE AND COLLEGE OPTION 42**  **PROGRAM-SPECIFIC DEGREE REQUIREMENTS 54**  **CONCENTRATION 24**  **REQUIRED FOR THE DREGREE 120** |

**Rationale:** Curriculum Modification Proposal 13-02, which passed College Council on 11/12/2013, indicates a need for a Media Computation course to be added to the Emerging Media Technologies program Creative Media Foundations. The addition of this course requires a 3-credit reduction in concentration required course credits and an additional reduction, by one, of the number of courses required in the Tangible Media concentration. The additional reduction in Tangible Media is justified by the fact that it requires 5-6 credits of General Education Common Core beyond the Media Design concentration and 2-4 credits of General Education Common Core beyond the Media Computation concentration.







