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.

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| **Title of Proposal** | **Revised Learning Outcomes-Applied Mathematics** |
| **Date** | **10/7/2009** |
| **Major or Minor** | **Minor** |
| **Proposer’s Name** | **Professor Jonathan Natov** |
| **Department** | **Mathematics** |
| **Date of Departmental Meeting in which proposal was approved** | **10/3/2019** |
| **Department Chair Name** | **Sandie Han** |
| **Department Chair Signature and Date** | **10/16/2019** |
| **Academic Dean Name** | **Justin Vazquez-Poritz** |
| **Academic Dean Signature and Date** | **10/21/19** |
| **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. | **Revise the learning outcomes for the Applied Mathematics major to be more coherent. We use a more modern framework.** |
| **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). | **Educators speak of the skills needed for the 21st century: communication, collaboration, creativity and critical thinking. See for example,** [**http://www.nea.org/tools/52217.htm**](http://www.nea.org/tools/52217.htm) **(10/2019)**    **We recast our current, more fragmented, outcomes into this more coherent framework.** |
| **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 is a new proposal.** |

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**

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

**EXISTING PROGRAM MODIFICATION PROPOSALS**

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

**Revised Applied Mathematics Learning Outcomes**

**Our proposed new outcomes:**

1. Communication: Communication skills include the ability to write and speak clearly, and actively read and listen. Applied math majors can present information and respond to questions clearly and persuasively, using language appropriate for the target audience.

2. Collaboration: Applied math majors can work well with others. They learn about different roles in organizations, and where to turn for help. They understand their responsibilities, and develop leadership skills.

3. Creativity: Mathematics models are representations. Applied Math majors can make connections, select and refine mathematical models. They can balance the need for accuracy and for quick approximations. Applied Math majors create useful models of real-world problems.

4. Critical Thinking: Applied Math majors can solve problems using mathematical analysis and computational tools. They analyze and critique models and data, identify arguments and assumptions and evaluate supporting evidence.

**Rationale:**  
In the 21st century, educators speak of the skills needed for success: communication, collaboration, creativity and critical thinking. For example, please see the webpage of the National Education Association: http://www.nea.org/tools/52217.htm

We believe it is time for us to place our Applied Mathematics outcomes into a modern framework. This will help us in the assessment of our baccalaureate program. We are not changing course outlines, nor are we modifying degree requirements.

Our Applied Mathematics program began in 2004, at a time when educators still spoke of the 3R's: reading, writing and arithmetic. We would up with a somewhat disjointed list of outcomes that lacked a coherent structure.

• Organize and analyze data  
• Formulate problems mathematically and choose appropriate methods to solve them  
• Make detailed logical arguments   
• Use technology effectively in the solutions to mathematical problems when it is appropriate  
• Communicate clearly and persuasively  
• Make professional presentations  
• Be prepared to enter the workforce, or pursue a Master's degree

We are recast old outcomes into our new framework. Below are the details.

• Organize and analyze data (Critical Thinking)  
• Formulate problems mathematically and choose appropriate methods to solve them (Creativity)   
• Make detailed logical arguments (Critical Thinking)   
• Use technology effectively in the solutions to mathematical problems when it is appropriate (Critical Thinking)  
• Communicate clearly and persuasively (Communication)   
• Make professional presentations (Communication)  
• Be prepared to enter the workforce (Communication, Critical Thinking, Creativity and Collaboration) or pursue a Master’s degree (Communication, Critical Thinking, Creativity and Collaboration)

**Chancellor’s Report**

**I. Changes to Learning Outcomes**

**The following revisions are proposed for the Bachelor’s of Science in Applied Mathematics**

**Program: BS in Applied Mathematics**

**Program Code: APLM - Hegis 1703**

**Effective Date: Spring 2020**

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| FROM: | TO: |
| ~~• Organize and analyze data~~  ~~• Formulate problems mathematically and choose appropriate methods to solve them~~  ~~• Make detailed logical arguments~~  ~~• Use technology effectively in the solutions to mathematical problems when it is appropriate~~  ~~• Communicate clearly and persuasively~~  ~~• Make professional presentations~~  ~~• Be prepared to enter the workforce, or pursue a Master's degree~~ | * **Communication**: Communication skills include the ability to write and speak clearly, and actively read and listen. Applied math majors can present information and respond to questions clearly and persuasively, using language appropriate for the target audience. * **Collaboration**: Applied math majors can work well with others. They learn about different roles in organizations, and where to turn for help. They understand their responsibilities, and develop leadership skills. * **Creativity**: Mathematics models are representations. Applied Math majors can make connections, select and refine mathematical models. They can balance the need for accuracy and for quick approximations. Applied Math majors create useful models of real-world problems. * **Critical Thinking**: Applied Math majors can solve problems using mathematical analysis and computational tools. They analyze and critique models and data, identify arguments and assumptions and evaluate supporting evidence. |